OAKLAND UNIVERSITY

Volume 3

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

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The academic requirements described in this catalog are in effect fall semester 2017 through summer semester 2023. Undergraduate students admitted to a degree-granting program may use provisions in this catalog to meet requirements within that time frame.

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Board of Visitors

The Board of Visitors provides a direct link between the business community and the School of Business Administration. The Board is composed of outstanding alumni and corporate and professional leaders. Board members assist the dean with supporting its mission in the external community as well as provide consultation on goals and objectives.

The Board members are:
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Mission

The mission of the School of Business Administration is to advance knowledge and enhance students' abilities to manage in a global business environment. The mission is achieved through a synergistic combination of teaching, scholarship and professional service, with emphasis on the linkage of theory and practice, and the application and management of technology. To achieve these ends, the SBA promotes collaborative relationships among students, faculty, administrators and employers.

General Information

The School of Business Administration (SBA) undergraduate programs enable students to combine the intensive study of a functional area of business (i.e., accounting, actuarial science, finance, human resources management, management information systems, marketing or operations management) or business economics with a broad background in management. Alternatively, students can focus on economics, the fundamental discipline behind business processes. In these programs, a strong foundation in liberal arts is combined with a rigorous education in written and oral communications and in problem definition, analysis and resolution. This combination produces graduates who can think analytically, communicate effectively and work cooperatively with others of similar or diverse backgrounds in both domestic and international environments. Graduates of these programs are prepared to handle the increasingly complex and changing problems faced by managers in profit-oriented enterprises and not for-profit organizations, both public and private.

The programs include:

1. Bachelor of Science with majors in accounting, business economics, economics, finance, general management, human resources management, management information systems, and marketing and operations management;
2. Bachelor of Arts with a major in economics (offered in conjunction with the College of Arts and Sciences (see the Department of Economics section in the Arts and Sciences portion of the catalog for a description of this program);
3. Bachelor of Science with a major in actuarial science (offered in conjunction with the College of Arts and Sciences (see the Department of Economics and the Department of Mathematics and Statistics section in the Arts and Sciences portion of the catalog for a description of this program);
4. Minors in accounting, business, business analytics, economics, entrepreneurship, finance, human resources management, information security management, international management, management information systems, marketing, and operations management.

High school students who intend to pursue a major offered by the SBA should consult the *Admissions* section of the catalog for specific preparation requirements. Students transferring from other institutions, both international and domestic, may be requested to provide documentation of the content and scope of the courses they have taken at their previous institutions.

The SBA offers a Master of Business Administration (MBA) degree for students in any major, including business and management. The MBA is a professional program in business designed to prepare students for careers involving problem identification, problem-solving, decisionmaking and leadership in any type of organization. MBA students may elect concentrations in accounting, business economics, entrepreneurship, finance, human resources management, international business, management information systems, marketing, operations

management, or supply chain management. It is preferred that students with an undergraduate degree in business or one of the functional areas of management have two years of work experience before entering the MBA program. Students interested in pursuing this degree should contact the Office of Graduate Business Programs, 238 Elliott Hall, (248) 370-3287 for more information.

The SBA offers a Master of Accounting degree that prepares graduates for a variety of professional accounting positions in public accounting, corporations and other organizations. It provides appropriate technical accounting coursework and results in the 150 credits required to become a Certified Public Accountant. Interested students should see the section on the Requirements for the accounting major for more information and contact the Office of Graduate Business Programs, 238 Elliott Hall, (248) 370-3287 for detailed information on admissibility into the program.

The SBA offers a Master of Science in Information Technology Management (MSITM) degree. The goal of the program is to provide a strong technical and managerial background to those who are interested in using information technology for competitive advantage. It is intended to provide business professionals with the knowledge they need to manage information technology effectively in support of their decisionmaking. It is also intended to provide information systems professionals with knowledge of the latest technologies and their use in application development. Students interested in pursuing this degree should contact the Office of Graduate Business Programs, 238 Elliott Hall, (248) 370-3287 for more information.

The SBA offers the Executive MBA (EMBA) and is designed for professionals who are already engaged in successful careers and want to build a strong business foundation while enhancing their leadership and management skills. The program offers the schedule flexibility required for a full-time executive. Two program concentrations are available: Health Care Management or Information Systems Leadership. Students interested in pursuing this degree should contact the Office of Graduate Business Program, 238 Elliott Hall, (248) 370-3287 for more information.

Oakland University undergraduates working on majors other than those in business administration may complete their prerequisites and some core courses for the MBA program while completing their undergraduate degree. For detailed information contact the Office of Graduate Business Programs.

The SBA is accredited, on both the undergraduate and the graduate levels, by AACSB International (The Association to Advance Collegiate Schools of Business), the premier business school accreditation agency. In addition, the accounting program has achieved the separate AACSB accounting accreditation.

For more information on the SBA undergraduate programs, the MBA, the Master of Accounting program, the Master of Science in Information Technology Management program, accreditation, SBA courses and SBA faculty, visit the School's website.

Degree Requirements

The curriculum described shall be followed by students entering the School of Business Administration beginning in the fall 2018 semester. Students enrolled prior to fall 2018 may choose to satisfy either the degree requirements listed in this catalog or those in the catalog of the academic year in which they were initially admitted to pre-business or undecided business in the SBA (or any catalog during the interim), provided that catalog is not more than six years old at the time of graduation. Students who transfer to the SBA after admission to the university or who are readmitted to the university are required to follow the requirements of the catalog in effect at the time they transfer or are readmitted. As described below, students may choose to meet the general education requirements of a different catalog.

To ensure they have met all requirements, students should seek a final program audit from one of the school's academic advisers no later than the semester before the semester in which they plan to graduate. The responsibility for meeting graduation requirements rests with the student.

The business administration programs consist of the following parts: general education (including U.S. diversity and writing foundations), the pre-core, the core, the major and free electives (if needed to reach 128 credits). Students in these programs must satisfy the specific requirements of each of these parts and must earn a minimum of 128 credits. (*See Bachelor of Science with a major in economics for the specific requirements of that degree program*.)
Each student must:

1. complete at least 128 credits, including any free electives needed to reach this total;
2. complete the university general education requirement as detailed in the general education section below, also under *Undergraduate degree requirements*;
3. complete the pre-core requirements as listed below and be admitted to major standing in business administration as detailed in the Admission to major standing in business administration section below;
4. complete the core program and the requirements of one of the business majors in the SBA with a minimum grade of C in each of the pre-core, core and major courses. Once admitted to the business program as a pre-business or undecided business student or major, a student must complete all of the remaining business core, major and business minor coursework for the degree at Oakland University;
5. complete at least 32 credits at the 3000 level or above;
6. complete at least 32 credits at Oakland University, of which at least 31 credits must be in courses offered by the School of Business Administration, excluding ECN 1500, ECN 2000 or ECN 2020, ECN 2010, ECN 2100 and QMM 2400, QMM 2410 and QMM 2500. Of these 31 credits, at least 12 credits must be in the student's major;
7. earn a cumulative grade-point average of at least 2.00 in courses taken at Oakland University and in courses taken in the SBA.

Academic Advising, Mentoring and Major Standing

Students who have questions about schedule planning, degree requirements, admission to the SBA, major standing, transfer credit, petitions of exception or graduation audits should meet with the school's assigned advisers. Academic advising can be found in 232 Elliott Hall, (248) 370-3285. To avoid delays, students are encouraged meet with their assigned adviser prior to early registration periods. Once major standing has been achieved (see *Admission to major standing in Business Administration*), students are encouraged to consult with faculty within their major area to discuss schedule planning within the major, career tracking and other issues relevant to making academic decisions that will enhance opportunities for success within a chosen career field.

The school offers advising and mentoring to students who plan to pursue one of its degree programs. Faculty members are available to provide support, curricular guidance and career information as students make the transition from high school or a previous college to Oakland University's business administration or economics programs. Incoming freshmen and transfer students are encouraged to seek information from these experienced faculty members.

The ACHIEVE Program

The goal of the ACHIEVE Program is to help students in the School of Business (SBA) make the transition from high school graduates to "day one professional workers" in their chosen field of study. The SBA accomplishes this goal by integrating professional and career development into its undergraduate curriculum. Business students participate in mandatory prescribed activities that enhance their career and professional skills. This professional development series is structured so that students learn about different business careers and the leadership and professional skills they will need to land a job and succeed in their chosen profession.

Requirements for Business Administration Majors

General education requirement

Students in the School of Business Administration must satisfy the General Education Requirements. Students may use one catalog for the general education requirements and another for the specific degree requirements. Students enrolled prior to fall 2018 may choose to satisfy either the general education requirements listed in this catalog or those in the catalog of the academic year in which they were initially admitted to Oakland University (or any catalog during the interim), provided that catalog is not more than six years old at the time of graduation. The general education requirements may be summarized as one course from the approved lists in each of the following categories:

- Writing: This category includes:
    a. WRT 1060 and its prerequisites;
    b. an intensive writing course in other general education requirements. This category is normally covered for business majors by WRT 3082 - Business Writing or ECN 3260; and

c. an intensive writing course in the major. This category is normally covered for business majors by MGT 4350 - Management Strategies and Policies, STA 4002, or ECN 4050.

- Formal Reasoning: This category is normally covered for SBA majors by the required MTH 1221 or MTH 1222 or MTH 1554.
- Knowledge Explorations: The social science requirement in this category is normally covered for SBA majors by (ECN 2000 or ECN 2020) or ECN 2010 or ECN 2100. The global perspective requirement in this category is normally covered for SBA majors by ECN 2020 or ECN 3260. The rest of this category is covered by one course each in the arts, foreign language and culture, literature, natural science and technology, and Western civilization.
- Knowledge Application: This category is normally covered for business majors by QMM 2400, QMM 2410 or QMM 2500.
- Capstone course: This category is normally covered for business majors by MGT 4350, ECN 4500, or ACS 4550.
- U.S. diversity: Select a course that meets one of the other knowledge exploration general education requirements and has the required diversity section.

SBA students are encouraged to increase their background in ethics by taking PHL 1300 - Introduction to Ethics, to satisfy the university's Western civilization general education knowledge exploration requirement.

Pre-core requirements

As preparation for the various majors of the business administration program, students must complete the following courses in writing, speech communication, mathematics, business modeling with computers, economics, accounting and statistics with minimum grade of C in each course. Students who have taken ECN 2000 under a previous catalog will be able to count this course toward the ECN 2020 requirement.

The required writing and pre-core courses are:

WRT 1060 - Composition II (or complete the writing requirement in another manner)	4
COM 2000 - Public Speaking	4
or COM 2403 - Group Dynamics and Communication	4
MTH 1221 - Linear Programming Elementary Functions	4
and *MTH 1222 - Calculus for the Social Sciences	4
or MTH 1441 - Precalculus	4
and **MTH 1554 - Calculus I	4
MIS 1000 - Business Problem Solving with Information Technology	3
ECN 2020 - Principles of Global Macroeconomics or ECN 2000 - Principles of Macroeconomics	
and ECN 2010 - Principles of Microeconomics	

or ECN 2100 - Principles of Economics - a 6 credit course that covers the material of both (ECN 2000 or ECN 2020) and ECN 2010	6-8
ACC 2000 - Introductory Financial Accounting	4
ACC 2100 - Managerial and Cost Accounting I	4
QMM 2400 - Statistical Methods for Business I or (***STA 2220 or STA 2226)	
QMM 2410 - Statistical Methods for Business II	
or QMM 2500 - Statistical Methods for Business - a 6 credit course that covers the material of both (QMM 2400 and QMM 2410)	3-7
TOTAL	35-42

In addition, students admitted to the SBA as pre-business or undecided business majors are required to meet the 0 credit ACHIEVE courses required for major standing (SBC 1990, SBC 2990).

**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 (students who meet this criterion under a previous catalog will be able to waive MTH 1221 or MTH 1441).*

**If a student receives transfer credit for MTH 1222 or MTH 1554, MTH 1221 or MTH 1441 is not required (students who meet this criterion under a previous catalog will be able to waive MTH 1221 or MTH 1441).*

***If a student does not place into MTH 1222 or MTH 1554, MTH 1221 and MTH 1222 or MTH 1441 and MTH 1554 or MTH 1441 and MTH 1222 must be completed with the required minimum grade.*

****Students who have taken STA 2220 or STA 2226 under a previous catalog may also use these courses as a substitute for QMM 2400.*

The freshman and sophomore years of study for students pursuing the business administration program will be devoted to the writing, general education and pre-core course requirements. Special emphasis should be given during the freshman year to the completion of the university writing requirement and steady progress in the mathematics sequence. Once sophomore status has been achieved (28 credits), students will begin work on the accounting and statistics requirements. The student's specific mathematics and statistics sequence will depend on the student's math placement results but can include MTH 0661, MTH 0662, MTH 1221, MTH 1222, QMM 2400 and QMM 2410 (or QMM 2500). Steady progress in the mathematics and statistics sequence is defined as one course in the sequence in each fall and winter semester until the sequence is completed.

Admission to Major Standing in Business Administration

Students are strongly recommended to apply for major standing during the semester they are completing their pre-core classes and have the minimum grade-point average. Major Standing is required to complete MGT 4350, may be required for some 3000 and 4000 level courses within a student's major, and in order to be awarded an undergraduate business degree. Applications are available on line and can be filed with the Undergraduate Advising Office, 232 Elliott Hall.

Students who do not apply for major standing during the semester that they are completing the pre-core requirements run a high risk of registration and major completion difficulties. To be eligible to take 3000 and 4000 level business courses for which major standing is a pre-requisite, business majors must be admitted to major standing in the School of Business Administration. Admission to major standing is selective. The minimum requirements for consideration are:

1. Student's admissibility to and retention in the university;
2. Completion of the writing requirement;
3. A minimum grade-point average of 2.6 in all courses taken at Oakland University (with a minimum of six credits completed at Oakland University);
4. A minimum grade of C in each of the following pre-core courses or their equivalents: ACC 2000, ACC 2100; COM 2000 or COM 2403; ((ECN 2010 and (ECN 2000 or ECN 2020)) or ECN 2100))*; MIS 1000; (MTH 0661, MTH 0662 if required by the math placement); MTH 1221, MTH 1222; QMM 2400, QMM 2410 (or QMM 2500);
   **Students cannot receive credit for both ECN 2100 and (ECN 2000 or ECN 2020) orECN 2010.*
5. Submission of an "Application for Major Standing" for the desired major;
6. Completion of SBC 1990 and SBC 2990 for all SBA students admitted to Oakland University after 2008-2009 for First Time in Any College (FTIAC) students and after 2009-2010 for transfer students. Students who entered under a previous catalog should follow these requirements.

A student is classified as pre-business upon admission to Oakland University if they have a cumulative GPA of 2.80 or above and four years of college preparatory math. Transfer students are classified as pre-business if they have a cumulative transfer GPA of 2.80 or above and math through intermediate algebra. All other students are classified as undecided business and these students cannot register for most 3000- and 4000-level courses until they obtain pre-business or major standing status within the SBA. Undecided business students may register for all SBA pre-core courses and general education requirements.

To maintain pre-business status before obtaining major standing within the SBA, an OU student must maintain a cumulative GPA set by the SBA. Any pre-business student (SBA students not yet having major standing) who does not maintain an OU cumulative GPA (as set by the SBA) at the end of any term is classified as an undecided business student. During the 2018-2019 academic year, the GPA set by the SBA for pre-business status is 2.6.

Core Program

Each of the business major programs require the completion of a common core of courses introducing students to the functional areas of business. Most of the 3000-4000 level business courses in the core program (i.e., MKT 3020, ORG 3300, MIS 3000, POM 3430, FIN 3220, ORG 3310, and MGT 3500) require a student to be coded as pre-business or be in major standing (see Admission to Major Standing in Business Administration for requirements to be coded as pre-business). All core courses require a minimum grade of C.

	Credits
WRT 3082 - Business Writing (or ENG 3110)*	4
MKT 3020 - Marketing	4
ORG 3300 - Introduction to Organizational Behavior	3
MIS 3000 - Management Information Systems	3
ECN 3030 - Managerial Economics	3
POM 3430 - Operations Management	4
FIN 3220 - Managerial Finance I	4
ORG 3310 - Introduction to the Management of Human Resources	3
MGT 3500 - Legal Environment of Business	3
**MGT 4350 - Management Strategies and Policies	4
TOTAL	35

**Students who have taken this course under a previous catalog will be able to use this course to satisfy WRT 3082.*

***MGT 4350 requires major standing and only business majors may take this course.*

Major Programs

Students take 15-24 additional credits specified in their major area. The junior and senior years will be devoted to the successful completion of the requirements of the core and major. Majors from which business administration students may choose are detailed below. Double majors are permitted in all areas except general management. No more than four credits of independent study (4996) courses may be used to meet the major elective requirement. Courses numbered 3800 and 4900 may be repeated for up to eight credits provided the topics are different. Students will be required to complete ACC 3990 or ECN 3990 or FIN 3990 or MGT 3990 or MIS 3990 or MKT 3990 or ORG 3990 or POM 3990 as part of their major program. (These courses require major standing.)

Free Electives

Students complete their program by taking a course or courses of their choice to yield a total of 128 credits. While the General Education Requirements of the degree program provides students with the range of knowledge that is the essence of an educated person, the free elective portion of the program allows students to make choices concerning coursework that responds to their individual interests and/or needs.

Minors

The School of Business Administration offers 11 minors for students who want to combine their majors with an introduction to the skills, analytical techniques and institutional material of economics or an area of business.

Business majors may earn any of the following minors, except in the area in which they are majoring, and the business minor. Once admitted to the business program as a pre-business or undecided business student or as a major, business majors must take all the remaining courses in their minors at Oakland University.

To earn any of these minors (except business), and to take 3000- and 4000-level business classes, **non-business students must meet with the minor coordinator and have an approved minor authorization form detailing the courses and the prerequisites required for the given minor. Once approved for the minor, students must take all the remaining courses in the minor at Oakland University. Students must complete the prescribed courses for the minor with a grade of C or better in each course and the prerequisites for each course. Transfer students planning to earn a minor must earn at least nine credits toward the minor at Oakland University; at least six of these nine credits must be in courses at the 3000 level or above.**

Limit for non-business majors to less than 25 percent of credits in business: All students who are not majors in the SBA and economics majors in either the SBA or the College of Arts and Sciences, whether they have applied for a minor or not, are limited to no more than 25 percent of the total degree credits in business courses. (Students majoring in business economics are not subject to this limitation.) The maximum of 25 percent of total degree credits (usually 32 credits) includes business courses taken at Oakland University and all previous colleges. Economics (ECN) courses, QMM 2400, QMM 2410 , QMM 2500, QMM 4400 and QMM 4520 are excluded from this requirement. Therefore, students from majors outside the business administration program may not earn more than 25 percent of total degree credits in transfer plus Oakland credits in ACC, ENT, FIN, MGT, MIS, MKT, ORG, POM or QMM courses (excluding those noted above). All student minors are subject to the 25 percent of total degree credits maximum discussed above.

Policies and Procedures

High school admissions

For entering freshmen, admission to pre-business is restricted to those presenting a minimum 2.80 cumulative grade-point average in high school academic courses and at least four years of college preparatory mathematics courses.

Transfer policy

Transfer students must have at least a 2.80 cumulative grade-point average and mathematics through intermediate algebra (equal to MTH 0662) for admission to pre-business. Evaluation of transfer courses is a two-part process. General education and composition courses are evaluated by the Academic Records Office. Business courses, including any required computer science courses, are evaluated by the School of Business Administration. Credit for specific SBA courses is authorized for courses of similar content taken prior to attending Oakland University at other colleges and universities accredited by a regional accrediting agency. Students transferring from other institutions may be required to submit course descriptions and related materials to aid in these transfer evaluations. Once admitted to the business program as a pre-business or undecided business student or a business major, business majors must complete all the remaining core, major and business minor coursework for the degree at Oakland University unless the coursework is part of an approved study abroad/away program. Students who have transfer courses that are more than seven years old may be required to retake the course at Oakland University. All transfer courses from another institution need to be a minimum of three credits for the SBA to evaluate them for transfer credit for pre-core, core, and major courses and must have a minimum grade of C to meet the requirement. See *Transfer student information* for additional information.

Internal transfer

Oakland University students seeking admission to pre-business from other programs will be considered for admission after they have completed MTH 1221 (or an equivalent) with a grade of C or better. An overall GPA of 2.60 or better in at least 12 credits at Oakland University is also required. Students who do not meet the criteria for pre-business will be considered for admission to undecided business if their cumulative GPA is a 2.0 or better.

Second majors

Students who return to the SBA to complete a second major after graduating with a business major from OU must complete all courses remaining for that second major at Oakland University. Additionally, students must fulfill the stated major requirements in effect at the time they are admitted as a second major.

Second degrees

Students who currently hold a bachelor's degree from a regionally accredited institution, including Oakland University, may pursue a second undergraduate degree at Oakland University in the School of Business Administration with the exclusion of those applicants holding a

bachelor's of science degree in Business Administration from Oakland University with a major in General Management.

Second degree students from regionally accredited institutions are exempt from Oakland University's general education requirements, including the undergraduate requirement for the writing foundations course at the level of WRT 1060 . Credits applied toward the first degree will be accepted as transfer credit toward the second degree. At least 32 additional credits must be taken at Oakland University, of which 31 credits must be in courses offered by the School of Business Administration, excluding ECN 1500, ECN 2000, ECN 2010, ECN 2010, ECN 2100, and QMM 2400 , QMM 2410, and QMM 2500. Of these 31 credits, at least 12 credits must be in the student's major. Second degree students are exempt from ACHIEVE-SBC 1990, SBC 2990 and SBC 3990, however, they are encouraged to take these non-credit courses as part of their program.

Students considering admission for a second degree are advised and highly encouraged to investigate opportunities in the Graduate Business Programs such as a Master of Business Administration, Master of Accounting programs or Master of Science in Information Technology Management prior to meeting with an Undergraduate Adviser.

Repeats

Repeats of a course: a student can repeat, either at Oakland University or at another approved institution, any business pre-core or core course in which a C grade or better is required. The student is limited to the university maximum of three attempts for any one course requirement, including attempts at Oakland and for the equivalent course at another institution, and must have a petition of exception approved for a fourth attempt. Students must get prior approval from an SBA Adviser in order to repeat a course at another institution. If a student repeats a course at another institution, the original grade attained in the course at OU will be included in the student's GPA. See "Repeating courses" in the *Academic Policies and Procedures* section of the catalog for more specific information on university rules governing course repeats.

Unsatisfactory performance

Unsatisfactory performance includes the following items:

Grades: Grades less than C and U grades are considered substandard. A course in which a grade below C has been earned may not be subsequently passed by competency examination or independent study.

Mathematics and Statistics Sequence: The SBA major is expected to take a math or statistics course each fall and winter semester until the student has completed either QMM 2410 or QMM 2500 with a minimum grade of C. Failure to take a course in the mathematics and statistics sequence (MTH 0661, MTH 0662, MTH 1221, MTH 1222, QMM 2400 and QMM

2410 or QMM 2500 depending on the student's math placement) each fall and winter term or its equivalent will be considered to be unsatisfactory performance and the student may be removed from the SBA business program.

Mandatory Advising: Undecided business students whose cumulative GPA is between a 2.0 and 2.59 may be required to meet with an academic adviser in the SBA following the semester when their cumulative GPA dropped below the required 2.6 and every semester thereafter until their GPA returns to at least a 2.6 cumulative. In some cases, a registration hold will be placed on a student's account until they complete the requirements of Mandatory Advising.

Grade appeals

If a student wishes to dispute a final grade in a course, he or she must submit a written appeal to the appropriate department chair no later than the following deadlines: 1. If the course was taken in winter or summer terms, the written grade appeal must be submitted no later than the end of the subsequent fall semester. 2. If the course was taken in the fall semester, the written grade appeal must be submitted no later than the end of the subsequent winter semester.

Prerequisites

In planning their schedules, students should ensure that they satisfy prerequisite and co-requisite conditions for courses. The prerequisites for SBA programs and courses will be strictly enforced. Students approved to fulfill prerequisites at another institution will need to solicit registration assistance from the Undergraduate Advising Office, 232 Elliott Hall, 248-370-3285. Students who have registered for courses for which they do not meet the prerequisites and other conditions may be administratively dropped from courses or have their registration cancelled.

Independent study

The purpose of an Independent Study is to provide *highly motivated students* the opportunity to construct a *unique educational experience* that goes beyond the courses contained in the existing course catalog. The basic rules for Independent Study are:

1. Student must have at least a 3.00 cumulative overall GPA.
2. Students must have achieved major standing.
3. Independent Study cannot be used in lieu of a required course.
4. It is the student's responsibility to develop an appropriate area of Independent Study and to arrange for a full-time faculty member to direct the Independent Study.
5. Part-time SBA faculty members cannot supervise an Independent Study.
6. The Independent Study contract must be completed by the student and signed by the faculty-adviser, department chair and the Director of Advising Services prior to registering for the course.

7. It is expected that the student will perform an amount of work equivalent to a regular course with the same amount of credits and that a substantive tangible output (exam, written paper, computer program, etc.) will be developed.
8. Interdisciplinary cooperation is permitted and a non-SBA faculty member may co-supervise the Independent Study. An SBA faculty member must be a supervisor and is responsible for assigning a final grade.
9. The student must be made aware of the basis for grading prior to registering for an Independent Study.
10. Undergraduate students cannot register for Independent Study if they already have or are taking more than eight cumulative credits of Independent Study unless an exception is agreed to by the SBA's Committee on Exceptions. Independent study courses cannot be used to satisfy a required major course.

Assurance of learning

To assist in the continuous improvement of its programs, the SBA engages in two different Assurance of Learning processes. The first type of Assurance of Learning is within each business major. This process involves evaluating student performance in a variety of discipline specific objectives. The evaluation is carried out each semester in different courses required for the major.

In evaluating the entire undergraduate business program, student assignments in core or pre-core courses are scored on whether each student exceeds, meets, or does not meet the SBA's expectations for a specific learning objective. This process occurs in different core and pre-core courses every semester. Although this score is not used in calculating a student's course grade, the assignment also receives a traditional grade from the instructor just as does other course assignments. The Learning Goals for the undergraduate business program and their corresponding Learning Objectives are:

Learning Goal 1: Critical Thinking (ECN 3030, FIN 3220, POM 3430)
Learning Objectives:

1. Identify the assumptions needed to analyze the assigned case or problem.
2. Identify the relevant and irrelevant data or information presented in the case or problem.
3. Identify the different questions or approaches that could be considered in order to answer the problem or case.
4. Derive or describe the solution to the problem or case.

Learning Goal 2: Global Business Environment (ECN 2020, MKT 3020)
Learning Objectives:

1. Show awareness of a global issue relevant to business or the economy.
2. Demonstrate understanding of factors and/or forces associated with this issue.

3. Explain the *impact* of this issue on the business environment.

Learning Goal 3: Information Technology and Management (MIS 1000, MIS 3000)
IT Learning Objectives:

1. Create a professional document using a word processor.
2. Conduct research using the Internet.
3. Create an effective presentation using a presentation package.
4. Collect and analyze data using a spreadsheet.
5. Use a database software.

IM Learning Objectives:

1. Identify alignment/misalignment of identified information (IS strategy) with organizational goals/objectives (organizational strategy).
2. Identify types of systems appropriate to the decisionmaking level within the organization.
3. Organize information properly for efficient storage and retrieval.
4. Identify the issues involved in creating information for decisionmaking from data sources.
5. Identify the use of IS to support decisionmaking in functional areas.

Learning Goal 4: Communications Skills (MGT 3500, MGT 4350, QMM 2410)
Written Communication Learning Objectives:

1. Be able to articulate main concept(s) in writing.
2. Be able to write logically.
3. Be able to write clearly and concisely.
4. Be able to write using correct grammar and spelling.

Oral Communication Learning Objectives:

1. Be able to articulate main concept(s) orally.
2. Be able to speak coherently.
3. Be able to keep audience's attention.
4. Be able to use time effectively.

Learning Goal 5: Real World Business Applications (MGT 4350, ORG 3310)
Learning Objectives:

1. Identify the underlying issue(s) for the given business situation or case.
2. Identify the appropriate theory (ies) or theoretical construct(s) that apply to the given business situation or case.

3. Apply theory (ies) or theoretical construct(s) to the given business situation or case to generate alternatives.

Learning Goal 6: Ethics (MGT 3500)
Learning Objectives:

1. Recognize basic concepts related to business ethics.
2. Apply an ethical decisionmaking process to an ethical dilemma presented to them.

Learning Goal 7: Foundation in Business Disciplines (MGT 4350)
Learning Objective:

1. Understand key concepts in business disciplines of accounting, economics, finance, management, marketing and operations management.

Policy regarding non-business majors

All students who are not business majors in the School of Business Administration, whether they have applied for a minor or not, are limited to no more than 25 percent of their total degree credits required for their degree in business courses (usually 32 credits). The maximum of 25 percent of total degree credits includes courses taken at Oakland University and all previous colleges. Economics (ECN) courses, QMM 2400, QMM 2410, QMM 2500, QMM 4400 and QMM 4520 are excluded from this requirement. Therefore, students from majors outside the business administration program, including economics majors in either the School of Business Administration or the College of Arts and Sciences, may not earn more than 25 percent of their required total degree credits in transfer plus Oakland credits in ACC, FIN, MGT, MIS, MKT, ORG, POM or QMM courses (excluding those noted above). Economics majors and students from other majors at Oakland University may take 1000-and-2000 level SBA courses as long as they have all the prerequisite courses with the required grades. Economics majors and students from non- business majors at Oakland University must have an approved university concentration/minor authorization form to take 3000-and-4000 level SBA courses which have the prerequisite of major standing.

Additional Information

Gaining Career Related Experience

Career Services assists students seeking noncredit paid work experience related to their major that will enhance their classroom learning, increase their motivation to graduate, augment their career knowledge, and improve their job seeking skills and employability. Opportunities are available for career related jobs, internships (corporate and grant-funded), and cooperative education. Students in the School of Business Administration who want to combine relevant work experience with their education are encouraged to participate in such programs. Students are coached and empowered to find jobs in business, non-profit or governmental organizations

similar to those held by recent Oakland University graduates. All students are encouraged to explore these programs and other job/career-related information using Handshake and by contacting the SBA Career Services office at 232 Elliott Hall, 248-370-4192.

First-time visitors to Career Services are encouraged to contact the central office at 154 North Foundation Hall, 248-370-3250. The central office also welcomes drop-in appointments for any students of the university. Please visit the website for information on the central office, including the drop-in schedule, signature events and more.

Honors, awards and scholarships

School honors are awarded by the SBA to graduating students who have completed a minimum of 32 credits in SBA courses with a minimum GPA of 3.33 in courses offered in the school. In addition to being eligible for honors available to all Oakland University undergraduates, students in the School of Business Administration are eligible for the following:

American Marketing Award: The Detroit chapter of the American Marketing Association awards certificates of achievement for scholarship and service to marketing majors.

Beta Gamma Sigma: Beta Gamma Sigma is the national honor society for business schools accredited by AACSB International (The Association to Advance Collegiate Schools of Business). Membership in Beta Gamma Sigma is one of the highest scholastic honors that a student in business administration can achieve. It is based on outstanding scholastic achievement as measured by overall grade-point average. Invitation for membership to Beta Gamma Sigma is extended to graduating seniors in the top 10 percent of their class and juniors in the top five percent of their class.

Financial Executives Institute Award: This award is presented annually to the undergraduate accounting or finance student who has demonstrated the highest standard of academic excellence. The student is honored at a meeting of the Detroit chapter of the Financial Executives Institute. Selection is made by the accounting and finance faculty of the SBA.

Omicron Delta Epsilon: Omicron Delta Epsilon is a national honor society for promising economics students. Selection for membership is made by the economics faculty.

School of Business Administration Awards / Scholarships

Accounting and Finance Advisory Board Accounting Scholarship: This $1,000 scholarship (applied to OU tuition) is awarded annually to an undergraduate accounting major who exhibits a strong interest in pursuing a career in accounting and demonstrates leadership. The scholarship winner is selected by the AFAB scholarship committee.

Accounting and Finance Advisory Board Finance Scholarship: This $1,000 scholarship (applied to OU tuition) is awarded annually to an undergraduate finance major who exhibits a strong interest in pursuing a career in finance and demonstrates leadership. The scholarship winner is selected by the AFAB scholarship committee.

Anonymous Endowed Accounting Scholarship: This $1,000 scholarship is for undergraduate or graduate accounting students with established records of exceptional scholarship in accounting preference will be given to students who are actively involved in student organizations.

Benedettini-Pearson Endowed Scholarship: This $2,500 scholarship is awarded to a freshman undergraduate student who has selected business or economics as their preferred program of study on their admissions application, has graduated from a public high school located in Detroit, Flint, Oak Park or Pontiac, and has demonstrated financial need.

Brian Meer Scholarship: Three $1,000 scholarships are awarded to undergraduate students who are enrolled at least part-time (six credit hours) in the School of Business Administration. Candidates must have a 2.8 or higher GPA and submit a one-page essay describing how receipt of an award will assist them, either directly or indirectly, in successfully completing their studies and obtaining the undergraduate degree.

Bud Kulezsa Family Endowed Scholarship: This $1,000 scholarship (applied to OU tuition) is awarded to an undergraduate accounting major who has at least a 3.0 overall GPA, and has at least a 3.0 GPA in accounting courses beyond ACC 2100 taken at OU. An entrepreneurial and/or international business interest will enhance the application.

Byunghak Cho Memorial Scholarship: This $1,500 scholarship (applied to OU tuition) is given to an undergraduate accounting or finance major who is in financial need and has exhibited an outstanding combination of academic performance, extracurricular activities and clear career goals of becoming a professional with business ethics.

Catherine Tyler Memorial International Endowment Award: This award is for undergraduate students in good standing with a declared major in the SBA or graduate students in the SBA in good standing and may be used for participation in a University approved study abroad or international internship program.

Clayton McKervey International Scholarship: This $1,500 scholarship (applied to OU tuition) is given to a Master of Accounting (MAcc) student or an undergraduate accounting major who has had international exposure and will be enrolled in the MAcc Program. The student must also exhibit an outstanding combination of academic performance and extra-curricular activities.

Crestmark Bank Scholarship: Two $10,000 scholarships are awarded to assist students with financial need who are pursuing a career in business administration. Applicants must be enrolled full-time in the SBA, have junior or senior standing, and must have applied for financial aid.

Deloitte Scholarship: This $1,500 scholarship (applied to OU tuition) is given to an undergraduate accounting or finance major who has exhibited an outstanding combination of academic performance and extracurricular activities.

Derderian Kann Seyferth & Salucci Scholarship: This $1,000 scholarship (applied to OU tuition) is open to self-supporting undergraduate accounting majors with a minimum GPA of 3.0.

Diane and Michael Grieves Endowed Diversity Scholarship: This scholarship ($3,500) will be awarded to an economically disadvantaged full-time undergraduate student who will have junior status (56 credits with a minimum of 24 credits taken at Oakland). The student must be pursuing a degree in Management Information Systems and maintain at least a 2.60 cumulative GPA at Oakland University, be a US citizen or legal permanent resident, and have applied for Financial Aid in the distribution year.

Dicron Tafralian Memorial Scholarship: This $3,000 scholarship (applied to OU tuition) is awarded annually, on a merit basis, to a continuing accounting major at Oakland University who has also applied to the MAcc Program. Selection is made by the accounting faculty of the SBA. This scholarship was established in memory of Dicron Tafralian, who served in administrative capacities at Oakland University for many years.

Doeren Mayhew Scholarship: Two $1,500 scholarships (applied to OU tuition) are awarded annually to undergraduate accounting majors who have exhibited an outstanding combination of academic performance and extracurricular activities. Candidates must have at least a 3.2 overall GPA in courses taken at Oakland University, and have an interest in pursuing a career in public accounting.

Dutkiewicz Family Accounting and Finance Scholarship: This $2,500 scholarship (applied to OU tuition) is given to an undergraduate accounting or finance major who has exhibited an outstanding combination of academic performance and extracurricular activities, with financial need.

Ernst & Young Scholarship: This $1,500 scholarship (applied to OU tuition) is given to an undergraduate accounting major who has exhibited an outstanding combination of academic performance and extracurricular activities.

Francis C. Amos SBA Alumni Scholarship: In honor of Michigan State representative Frances Amos, active alumna and ardent supporter of Oakland University, this $5,000 scholarship was established to reward outstanding business students who exemplify her commitment to community service and the pursuit of personal academic excellence. This scholarship is open to junior and senior business students who have achieved major standing. See application for other criteria.

Gadis and Susan Dillon Accounting Student Leadership Scholarship: This $1,500 scholarship (applied to OU tuition) is given to an undergraduate accounting major entering the OU MAcc

Program who has demonstrated outstanding leadership and support of the OU Accounting Student Professional Organizations (these organizations are OASIS, NABA and Beta Alpha Psi). Grade-point average may be considered, but is clearly subordinate to leadership activities.

Gale Blank Copple Endowed Economics Scholarship: Two $2,500 scholarships are given annually in recognition of outstanding achievements in economics and overall academic accomplishments to members of Oakland University's Women's Economic Society. Applicants must have junior standing. They must have completed at least four courses in economics with a GPA of at least 3.3 and must have an overall GPA of at least 3.0.

Gary and Elspeth Coats SBA Student Involvement Endowed Scholarship: This $1,000 scholarship is to encourage participation in a variety of university activities. Applicants must be enrolled full-time in the SBA taking a minimum of 12 credit hours per semester, have sophomore standing, and have a minimum cumulative GPA of 3.0.

Gerald M. and Tracy C. Nanni Accounting and Finance Scholarship: This $1,250 scholarship (applied to OU tuition) is awarded to an undergraduate accounting or finance major or a Master of Accounting (MAcc) student who has exhibited a combination of outstanding academic performance and demonstrated financial need.

Grant Thornton Scholarship: This $1,000 scholarship is awarded to a declared accounting major, who has achieved major standing. Is currently enrolled in at least one accounting major course at OU and has at least a 3.0 over GPA.

Helander SBA Social Impact Scholarship: This $1,000 scholarship is awarded to an undergraduate student pursuing a degree within the School of Business Administration, with sophomore standing (28 credit hours), and a minimum GPA of 3.5. Candidates must submit an essay highlighting goals and aspirations for pursuing a career in business and making a great impact in the world that influences lifelong change, including volunteer-experiences enhancing these goals.

Independent Bank Scholarship: This $2,500 scholarship is awarded to a student who is seeking any of the three economics degree programs offered at OU. The student must be in major standing and should have completed 56 credit hours, with a minimum of 30 credit hours remaining to complete a B.S. or B.A. degree in Economics. The student must be enrolled for a minimum of 12 credit hours during the fall and winter terms, and must be from Oakland, Macomb or Lapeer County. The student must also be eligible for the PELL Grant.

Islamovic-Skomski Scholarship: This $1,750 scholarship (applied to OU tuition) is given to a Master of Accounting (MAcc) student or an undergraduate accounting major who will be enrolled in the MAcc Program that has also exhibited outstanding academic achievement.

KPMG Scholarship: This $1,000 scholarship (applied to OU tuition) is given to an undergraduate accounting major who has exhibited an outstanding combination of academic performance and extracurricular activities.

Marty Nowosielski Memorial Scholarship: This $2,000 scholarship is awarded to a non-traditional student, who has declared an accounting major, achieved major standing, is currently enrolled in at least one accounting major course at OU at either the undergraduate or graduate level of study and have a minimum 3.4 GPA.

Marvin L. Katke Scholarship: Two $2,500 scholarships are awarded to business students who have demonstrated outstanding academic achievement and extracurricular and/or civic involvement. Students must have at least 56 credit hours, a minimum of 24 which have been earned at OU, and a minimum GPA of 3.0.

John and Cindi Lesser Finance/Accounting Scholarships: Two $1,500 scholarships are awarded (applied to OU tuition), one to an undergraduate accounting major and one to an undergraduate finance major with the best combination of academics and activities as determined by the Department of Accounting and Finance faculty.

Mukesh Bhargava Scholarship: This $1,500 scholarship was created in 2013 to honor Mukesh Bharghava, a distinguished marketing faculty member at Oakland for 18 years. This is a one-year scholarship for students with junior or senior standing pursuing a degree in marketing, with demonstrated financial need.

Patti Finnegan Sharf SBA Study Abroad Endowed Scholarship: This award is for undergraduates in the School of Business Administration, who will be traveling outside the United States through a university approved academic program. The students will be traveling to countries deemed safe by the University. Preference will be given to students who otherwise would not be able to participate in such a study abroad program due to financial needs.

Plante & Moran Golden Rule Scholarship: This $1,250 scholarship (applied to OU tuition) is given to an undergraduate accounting major who has exhibited outstanding academic performance and has an interest in public accounting.

Plante & Moran Golden Rule Scholarship - MAcc: This $1,250 scholarship (applied to OU tuition) is given to a Master of Accounting (MAcc) student or an undergraduate accounting major who is going to be enrolled in the MAcc program, and who has exhibited outstanding academic performance and has an interest in public accounting.

PriceWaterhouseCoopers Scholarship: This $1,500 scholarship (applied to OU tuition) is given to an undergraduate accounting major who has exhibited an outstanding combination of academic performance and extracurricular activities, and is interested in pursuing a career in public accounting.

PriceWaterhouseCoopers Scholarship - MAcc: This $1,500 scholarship (applied to OU tuition) is given to a Master of Accounting (MAcc) student or an undergraduate accounting major who will be enrolled in the MAcc Program that has exhibited an outstanding combination of academic performance and extra-curricular activities.

Professor Ronald M. Horwitz Outstanding Finance Student Scholarship Award: Two $1,500 awards are given to undergraduate finance majors with the best combination of academics and activities, as determined by the Department of Accounting and Finance faculty. Significantly greater emphasis is placed on academic performance in finance courses. Serving in a leadership role in student activities will also be an important factor.

R. Hugh and Nancy E. Elliott Endowed Scholarship: This award is granted to an undergraduate student athlete who has achieved junior or senior class standing and is enrolled in the School of Business Administration.

Robert Uptegraff, Sr. Scholarship: This $1,500 scholarship (applied to OU tuition) is given to a Master of Accounting (MAcc) student or an undergraduate accounting major who will be enrolled in the MAcc Program that has exhibited an outstanding combination of academic performance and extra-curricular activities.

Sarwan Singh Grewal Scholarship: This $1,500 scholarship (applied to OU tuition) is given to an undergraduate accounting or finance major who has exhibited an outstanding combination of academic performance and extra-curricular activities.

SBA Tower Scholarship: This $3,000 scholarship is awarded to an undergraduate student pursuing a degree in the School of Business Administration, with a minimum GPA of 3.0 and extracurricular and/or civic involvement.

SBA Transfer Scholarship: This $1,500 scholarship is awarded to an undergraduate transfer student pursuing a degree in the School of Business Administration. Candidates must submit an essay about experiences in education leading to transferring to Oakland, highlighting student activities and other initiatives while at Oakland.

Sid and Bani Mittra Economics Merit Scholarship: This $2,000 scholarship is given to a student pursuing a degree in economics in the School of Business Administration and who has exhibited an outstanding combination of academic performance and extracurricular activities. The student must have major standing in economics with 30 credits remaining to complete degree.

Society of Automotive Analysists "Thought Leader of Tomorrow Scholarship": This $2,500 scholarship benefits students seeking a career in the automotive industry and aims to support the future leadership that will drive innovation and growth within the automotive industry. Applicants must be enrolled at least half-time in the SBA, have junior or senior standing (56 credit hours) in the SBA, with a minimum of 24 credit hours taken at OU, and a minimum cumulative grade-point average of 3.2

Stephan and Rita Sharf Endowed Scholarship: This $2,000 scholarship is awarded annually to a student who has achiebed junior or senior class standing and is enrolled full-time in the School of Business Administration. Selection is based upon academic achievement and demonstrated financial need.

TMBKS Family Scholarship Award - DIS: This $1,500 award is available to students with an overall GPA of 3.0, a 3.40 GPA after pre-core and core requirements, and major standing in DIS. Student'sacademic performance, extra-curricular and community service activities will be considered.

UHY Distinguished Accounting Leadership Scholarship: This $1,000 scholarship (applied to OU tuition) is given to a Master of Accounting (MAcc) student or an undergraduate accounting major who will be enrolled in the MAcc program who has exhibited a combination of outstanding academic performance and leadership.

UHY Future Financial Leader Scholarship: This $1,000 scholarship (applied to OU tuition) is given to an OU undergraduate accounting or finance major who has exhibited a combination of outstanding academic performance in the pursuit of an accounting or finance degree and leadership skills.

The Warren Tope Memorial Scholarship: This $1,000 scholarship (applied to OU tuition) is given to an undergraduate accounting major with a 3.0 cumulative grade-point average or above. This scholarship is renewable for up to two additional years.

Course Offerings

Course descriptions follow each of the programs offered by departments in the School of Business Administration. Required pre-core and core courses for students majoring in the business programs are generally offered each fall, winter and summer semesters.

Some 3000- and 4000-level ACC, ENT, FIN, MGT, MIS, MKT, ORG, POM and QMM courses require major standing in business or an approved concentration / minor authorization form in order to register for the course. The 3000-level courses should be taken during the junior year (56-90 credits). Courses titled "Survey of" are only permitted for non-business majors pursuing a business minor. Except for courses that fulfill the business minor, 3000- or 4000-level courses can only be taken by non-business students if they meet the prerequisites (except for major standing) and the course is listed on an approved university concentration/minor authorization form.

The 5000-level ACC and MIS courses are designed as advanced electives for undergraduate accounting or management information systems majors and as electives for students in the Master of Accounting and MSITM programs. The school offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

Department of Accounting and Finance

Department Chair: *Mohinder Parkash*

Accounting Program Adviser: *Lori Dorko*

Finance Program Adviser: *Ellen Zhu*

Schedule of classes

Specific offerings for each semester may be found in the Schedule of Classes.

The following graduate level accounting courses are open to undergraduate accounting majors with permission of the Faculty Coordinator of the Masters of Accounting Program (See Graduate catalog for descriptions).

- ACC 5050 Business Law for Accountants
- ACC 5210 Federal Income Tax II
- ACC 5260 Accounting Information Systems: Audit and Control

Programs

- Accounting Minor
- Business Administration, Accounting Major, B.S.
- Business Administration, Finance Major, B.S.
- Finance Minor

Accounting Minor

Coordinator: *Roz Nowosielski*
The minor in accounting consists of a minimum of the following 20 credits and any prerequisites for these courses: ACC 2000, ACC 2100 and 12 additional credits 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, Accounting Major, B.S.

Requirements for the major in accounting

Major adviser: *Lori Dorko*

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

Required major courses -- 12 credits

- ACC 3100 - Intermediate Financial Accounting I **(3)**
- ACC 3110 - Intermediate Financial Accounting II **(3)**
- ACC 3180 - Accounting Information Systems: Planning and Analysis **(3)**
- ACC 3200 - Managerial and Cost Accounting II **(3)**
- ACC 3990 - Achieve III - Accounting **(0)**

Electives — choose 12 credits

- ACC 3500 - Federal Income Taxation **(3)**
- ACC 4010 - Advanced Financial Accounting **(3)**
- ACC 4110 - Auditing **(3)**
- ACC 4120 - Government and Not-for-Profit 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)

32 total credits

Note

Note: The 5000-level accounting courses are open to undergraduate accounting majors during their senior year with the permission of the Faculty Coordinator for the Masters of Accounting Program. Students who have taken ACC 5050, ACC 5210, ACC 5260 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 an accounting faculty member 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 158 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 Coordinator of the Master of Accounting Program 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 MAcc Faculty Coordinator can help you evaluate different options for your situation.

Business Administration, Finance Major, B.S.

Requirements for the major in finance

Major adviser: *Ellen Zhu*

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, or FIN 4300 , ACC 3200 or ACC 3500 under a previous catalog will be able to count these courses as electives.

Required in the core -- 4 credits

- FIN 3220 - Managerial Finance I **(4)**

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)**.

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

- FIN 4180 - Financial Institutions and Capital Markets **(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 4600 - Investment Portfolio Management **(3)**
- FIN 4900 - Special Topics in Finance **(3)**

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

25 total credits

Requirements for the major in finance, with a specialization in Wealth Management

Required in the core - 4 credits

- FIN 3220 - Managerial Finance I **(4)**

Required major courses - 15 credits

- ACC 3010 - Financial Reporting and Analysis **(3)**
- ACC 3500 - Federal Income Taxation **(3)**
- FIN 3600 - Investment Analysis **(3)**
- FIN 3680 - Financial Modeling **(3)**
- FIN 3720 - Managerial Finance II **(3)**

Electives - 3 credits - choose 1 elective

- FIN 4180 - Financial Institutions and Capital Markets **(3)**
- FIN 4250 - Financial Derivatives **(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)**

Finance Minor

Coordinator: *Robert Uptegraff*
The minor in finance consists of a minimum of 13 credits in finance courses including FIN 3220 or FIN 3550 and nine additional 3000 or 4000 level credits in finance (FIN) courses and any prerequisites for these courses (either ACC 3010 or ACC 3200 or ACC 3500 may satisfy three credits toward the finance minor). The prerequisites for the finance courses normally require up to 26 credits 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)] or ECN 2100 , QMM 2400 and QMM 2410 (or QMM 2500 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 who have taken FIN 3680 , FIN 4250 , FIN 4300, ACC 3200 or ACC 3500 under a previous catalog will be able to count these courses as electives.

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

Courses

ACC 2000 - Introductory Financial Accounting (4)
Introduction to accounting information as an aid to decisionmaking for external users of financial statements. Students learn how to measure and record accounting data, prepare financial statements and analyze published financial accounting information.
Prerequisite(s): MTH 1554 prior to or concurrent with ACC 2000 or [MIS 1000 and WRT 1060 and (MTH 1221 or MTH 1222 or MTH 1441)] with a minimum grade of (C) in each course

ACC 2100 - Managerial and Cost Accounting I (4)
Analysis of accounting methods providing data for optimal managerial decisions, implementation and control. Topics include cost allocation; cost, volume and price relationships; product cost accounting and control systems; operations and capital budgeting, and related behavioral, reporting and information processing aspects.
Prerequisite(s): ACC 2000 and MTH 1221 or MTH 1222 or MTH 1441 or MTH 1554 with a minimum grade of (C) in each course. MIS 1000 is recommended.

ACC 3000 - Survey of Accounting (4)
Introduction to financial and managerial accounting. Introduces the measurement systems used to control and evaluate business activities. It also explores product costing systems and using accounting data as a basis for management planning and decision making. Business majors, pre-business students and business undecided students cannot take this course.
Prerequisite(s): sophomore standing.

ACC 3010 - Financial Reporting and Analysis (3)
A study of financial accounting and reporting from the perspective of the user of accounting information. The course will emphasize the interpretation and analysis of specific accounting treatments rather than accounting methodology. Recommend FIN 3220 prior to or concurrent with ACC 3010.
Prerequisite(s): ACC 2100, with a minimum grade of (C).

ACC 3100 - Intermediate Financial Accounting I (3)
A study of financial accounting topics, including accounting valuation and reporting practices. Three major areas examined include financial accounting theory, current and noncurrent assets, and current and noncurrent liabilities.
Prerequisite(s): ACC 2100 and MTH 1222 or MTH 1554 with a minimum grade of (C) in each course.

ACC 3110 - Intermediate Financial Accounting II (3)
A continuation of ACC 3100. Major financial accounting areas examined include stockholders equity, dilutive securities, investments, income measurement issues, and the preparation and analysis of financial statements.
Prerequisite(s): ACC 3100 with a minimum grade of (C).

ACC 3180 - Accounting Information Systems: Planning and Analysis (3)
This course focuses on business modeling, data analytics and the integration of accounting systems with other information systems in the organization. In doing so, it emphasizes business risk as well as information technology risk and the controls that are available over both. Students should be capable of using the analytics and modeling skills acquired in this course in order to help analyze and develop modern, technologically relevant accounting information systems. The Systems Development Life Cycle is used as the course's logical framework, while the Unified Modeling Language set of methodologies is used to model real-world business systems using databases, decision analysis and networking.
Prerequisite(s): ACC 2100 and MTH 1222 or MTH 1554, with a minimum grade of (C) in each course.

ACC 3200 - Managerial and Cost Accounting II (3)
An analysis of available procedures and techniques to sharpen accounting analyses for managerial planning and control. Extends subjects introduced in ACC 2100 to non-manufacturing firms, decentralized firms, transfer pricing and segment performance measurement.
Prerequisite(s): ACC 2100 and MTH 1222 or MTH 1554, with a minimum grade of (C) in each course.

ACC 3500 - Federal Income Taxation (3)
An introductory tax course that focuses on fundamental federal income taxation concepts, with primary emphasis on business entities (e.g., C corporations, pass-through entities) and secondary emphasis on individual taxation. This course generally follows the objectives of the AICPA Model Tax Curriculum.
Prerequisite(s): ACC 3100 or ACC 3010 and MTH 1222 or MTH 1554, with a minimum grade of (C)

ACC 3990 - Achieve III - Accounting (0)
Guide students through the job search process within the Accounting major.
Prerequisite(s): major standing and SBC 1990 and SBC 2990

ACC 4010 - Advanced Financial Accounting (3)

Topics include accounting and reporting for business combinations, partnerships, consolidated entities, interim financial statements and segments of business enterprises.
Prerequisite(s): ACC 3110 with a minimum grade of (C), and major standing.

ACC 4110 - Auditing (3)
Introduction to the objectives, techniques, and standards of internal and external audits of the accounts of an enterprise. Generally accepted auditing standards will be critically examined.
Prerequisite(s): ACC 3110 and ACC 3180, with a minimum grade of (C) in each course and major standing.

ACC 4120 - Government and Not-for-Profit Accounting (3)
The characteristics of not-for-profit entities are analyzed and used to define the basic concepts of accounting for funds. Accounting and reporting principles applicable to governmental units, hospitals, schools and other nonprofit entities are discussed.
Prerequisite(s): ACC 3110 with a minimum grade of (C) and major standing.

ACC 4900 - Special Topics in Accounting (3)
Intensive study of special topics in accounting. See schedule of classes for current offering. May be repeated for a total of 6 credits.
Prerequisite(s): ACC 3010 or ACC 3110 with a minimum grade of (C) and major standing.

ACC 4996 - Independent Study (1 TO 3)
Qualified and highly motivated students may engage in individual research, directed readings or group study under the supervision of a faculty member. Offered every term. May be repeated for a total of 6 credits.
Prerequisite(s): an overall GPA of (B) or better, major standing, and an approved contract prior to registration.

FIN 3000 - Survey of Finance (3)
Course helps students develop a basic understanding of Finance. Topics covered include: (1) financial instruments and the markets in which they are traded, (2) financial planning and analysis, (3) the cost and time-value of money, and (4) the fundamentals of investor decision-making. Business majors, pre-business students and business undecided students cannot take this course.
Prerequisite(s): ACC 2000 (C) or ACC 3000 (C) and junior standing.

FIN 3220 - Managerial Finance I (4)

The basic elements of managerial finance. Topics include: capital budgeting techniques, financial structure and analysis, the cost of capital, working capital management and international financial management. For all SBA students, recommend QMM 2410 prior to or concurrent with FIN 3220. For finance major students, also recommend ACC 3010 concurrent with FIN 3220.
Prerequisite(s): ECN 2010 and ECN 2000 or ECN 2020 or ECN 2100 and ACC 2100 and MTH 1222 or MTH 1554 and [STA 2220 or STA 2226 or QMM 2400] with a minimum grade of (C) in each course.

FIN 3550 - Finance for Actuarial Science (4)
The application of the tools of financial analysis to specific cases in the financial management of corporate businesses with a special emphasis on valuation, including time value of money, and derivatives.
Prerequisite(s): ACC 2000, MTH 1554, and MTH 1555 (concurrently) with a minimum grade of (C) in each course.

FIN 3600 - Investment Analysis (3)
Provides a general framework for constructing portfolios and valuing investments. Important concepts include portfolio theory, credit analysis, valuation of call and conversions features on debt instruments, and fundamental analysis of equities and foreign assets. Recommend FIN 3720 and FIN 3680 concurrent with FIN 3600.
Prerequisite(s): (FIN 3220 or FIN 3550) and (ACC 3010 or ACC 3100) and (QMM 2410 or QMM 2500 or STA 2226) with a minimum grade of (C) in each course.

FIN 3680 - Financial Modeling (3)
Learn to develop, solve, and simulate theoretically sound financial models using Microsoft Excel and other analytical tools. The course covers standard financial models including valuation, pro forma model, portfolio optimization, efficient frontier and asset pricing models etc. The course should serve to bridge the gap between financial theory and its implementation. Recommend FIN 3600 and FIN 3720 concurrent with FIN 3680.
Prerequisite(s): (FIN 3220 or FIN 3550) and (ACC 3010 or ACC 3100) and (QMM 2410 or QMM 2500 or STA 2226) with a minimum grade of (C) and major standing.

FIN 3720 - Managerial Finance II (3)
The application of the tools of financial analysis to specific cases in the financial management of corporate businesses and nonprofit enterprises. Recommend FIN 3600 and FIN 3680 concurrent with FIN 3720.
Prerequisite(s): FIN 3220 and ACC 3010 or ACC 3100 and [QMM 2410 or QMM 2500 or STA 2226] with a minimum grade of (C) in each course.

FIN 3990 - Achieve III - Finance (0)
Guide students through the job search process within the Finance major. Prerequisite(s) major standing and SBC 1990 and SBC 2990

FIN 4180 - Financial Institutions and Capital Markets (3)
Focus is on the structure and operations of financial intermediaries, analysis of innovative financial instruments, and credit and interest-rate risk management.
Prerequisite(s): FIN 3600 with a minimum grade of (C) and major standing.

FIN 4190 - International Financial Management (3)
The application of the tools of financial analysis to cases and the problems of firms that have operations in several countries.
Prerequisite(s): FIN 3600 and FIN 3720 with a minimum grade of (C) and major standing.

FIN 4200 - Real Estate Investment Analysis (3)
A look at acquisition, financing and sale of income-producing real estate. Topics to be covered include feasibility, appraisal, investment, financing and taxation.
Prerequisite(s): FIN 3600 and FIN 3720 and FIN 3680 with a minimum grade of (C) and major standing.

FIN 4250 - Financial Derivatives (3)
Introduces students to various derivative products such as futures, forwards, swaps and options. Commonly used financial derivatives and their use in various hedging and speculative objectives will be addressed along with various frameworks for pricing derivatives.
Prerequisite(s): (FIN 3220 or FIN 3550) and (ACC 3010 or ACC 3100) and (QMM 2410 or QMM 2500 or STA 2226) with a minimum grade of (C) and major standing.

FIN 4300 - Mergers and Acquisitions and Corporate Restructuring (3)
Examines important issues in mergers and acquisitions, corporate restructuring, and corporate bankruptcy, including choices when faced with restructuring decisions. Addresses investment banking techniques used to enhance the firm's value, and methods of reorganizing a firm outside of bankruptcy.
Prerequisite(s): FIN 3600 and FIN 3720 with a minimum grade of (C) and major standing.

FIN 4600 - Investment Portfolio Management (3)
Analyzes trading in different types of spot and foreign assets, futures, options, and investment companies. Tax, transaction cost, and regulatory issues are evaluated, as are asset allocation and timing strategies, technical analysis, hedging, arbitrage, and portfolio management within the context of a financial plan.

Prerequisite(s): (FIN 3220 or FIN 3550) and (ACC 3010 or ACC 3100) and (QMM 2410 or QMM 2500 or STA 2226) with a minimum grade of (C) and major standing.

FIN 4779 - Estate, Retirement, and Education Planning (3)
This course teaches you how to conduct a estate planning, retirement needs analysis, Insurance needs, and education planning for individuals and to recognize the key factors that affect retirement plan selection for business owners. You will be able to evaluate and compare the characteristics of various retirement plans and recommend which plan is appropriate in a given situation. The course covers tax-deferred retirement plans, IRAs, nonqualified plans, Social Security, Medicare, Medicaid, distribution strategies, taxation of distributions, and regulatory considerations. Also covered are the insurance concepts for individuals.
Prerequisite(s): ACC 3010, ACC 3500, FIN 3600, FIN 3680, FIN 3720 with a minimum grade of C in each course and major standing.

FIN 4900 - Special Topics in Finance (3)
Intensive study of a selected finance topic. The topic will vary from term to term. May be repeated for a total of 6 credits.
Prerequisite(s): (FIN 3220 or FIN 3550) and (ACC 3010 or ACC 3100) and (QMM 2410 or QMM 2500 or STA 2226) with a minimum grade of (C) and major standing.

FIN 4996 - Independent Study (1 TO 3)
Qualified and highly motivated students may engage in individual research, directed readings or group study under the supervision of a faculty member. Offered every term. May be repeated for a total of 6 credits.
Prerequisite(s): an overall GPA of (B) or better, major standing, and an approved contract prior to registration.

Department of Decision and Information Sciences

Department Chair: *Vijayan Sugumaran*

Management Information Systems Program Adviser: *Vijayan Sugumaran*

Operations Management Program Adviser: *T.J. Wharton*

Schedule of classes

Specific offerings for each semester may be found in the Schedule of Classes.

Programs

Major

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

Minor

- Business Analytics Minor
- Information Security Management Minor
- Management Information Systems Minor
- Operations Management Minor

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

Major adviser: *Vijayan Sugumaran*

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 technical 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

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.

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)**
- MIS 4060 - Software Program and Project Management **(3)**

Electives -- choose three courses -- 9 credits

- MIS 4130 - Networks **(3)**
- MIS 4140 - Information Security Lab **(3)**
- MIS 4180 - IS Risk Analysis and 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 4360 - Decision Support Systems **(3)**
- MIS 4410 - Operations Analytics **(3)**
- MIS 4460 - Business Analytics **(3)**
- MIS 4470 - Practical Computing for Data Analytics **(3)**
- MIS 4500 - Web Analytics **(3)**
- MIS 4700 - IS Security **(3)**

- MIS 4750 - Mobile Security and Secure Application Development **(3)**
- MIS 4800 - Information Security Project **(3)**
- MIS 4900 - Special Topics in MIS **(3)**
- MIS 5460 - Business Analytics (3)[1]
- 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. Students who have taken MIS 4140, MIS 4180, MIS 4410, MIS 4460, MIS 4470, or MIS 4500, MIS 4700 , MIS 4750 , MIS 4800, MIS 5460, MIS 5630, or MIS 5640 under a previous catalog will be able to count these courses as an elective.

27 total credits

Business Analytics (BA) Specialization

Minimum of 27 Credits

Specialization Adviser: *Mark Isken*

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.

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)**
- MIS 4060 - Software Program and Project Management **(3)**

Required for BA Specialization - 6 credits

- MIS 4360 - Decision Support Systems **(3)**
- MIS 4460 - Business Analytics **(3)**

Electives - 3 credits

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

- MIS 4410 - Operations Analytics **(3)**
- MIS 4470 - Practical Computing for Data Analytics **(3)**
- MIS 4500 - Web Analytics **(3)**
- QMM 4400 - Management Science **(3)**

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.

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)**
- MIS 4060 - Software Program and Project Management **(3)**

Required for ISM Specialization - 6 credits

- MIS 4180 - IS Risk Analysis and Controls Development **(3)**
- MIS 4800 - Information Security Project **(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)**

Business Administration, Operations Management Major, B.S.

Requirements for the major in operations management

Major adviser: *T.J. Wharton*

The major in operations management (OM) provides a strong managerial and technical education to students interested in the field of operations management (e.g., manufacturing planning and control, supply-chain management, project management, lean and quality management). The program will provide students with the fundamental knowledge they need to work effectively in operations functions, as well as advanced knowledge about best practices, current technologies, tools and their application, and leadership skills necessary to operate in a globally diverse and competitive marketplace. Students can choose to specialize in

Supply Chain Management or Lean and Quality Management or Project Management. The specialization will appear in the student transcript and the diploma. Students also have the option of not choosing a specialization and getting a general Operations Management Major without any specialization.

To fulfill the requirements for the major in operations management, students must be admitted to major standing in operations management, complete the required courses for the OM Major and the specializations (if chosen) as well as appropriate number of electives as specified below, with a grade of C or better in each major course. A grade of C or better must be achieved in POM 3430 and in each prerequisite for an operations management course before a student may begin work in that operations management course. Students who have taken POM 4350 under a previous catalog will be able to count this course toward an elective requirement.

No Specialization

Minimum of 22 Credits

Adviser: *T.J. Wharton*

Required for OM Major:

- POM 3430 - Operations Management (4)
- POM 3990 - Achieve III - Operations Management (0)

Electives: Six (6)

Choose six (6) from the list of Electives:

- POM 4350 - Service Operations Management (3)
- POM 4400 - Process Management (3)
- POM 4410 - Operations Analytics (3)
- POM 4420 - Supply Chain Management (3)
- POM 4430 - Operations Planning and Control (3)
- POM 4480 - Project Management (3)
- POM 4900 - Procurement and Global Sourcing (3)
- POM 4900 (HRD 4600) - Lean Kaizen in Organizations (4)
- QMM 4400 - Management Science (3)
- QMM 4520 - Forecasting (3)

- ACC 3200 - Managerial and Cost Accounting II (3)

Students who are on a previous catalog can count POM 4410 as an elective for operations management no specialization. Students who are on a previous catalog can use any POM elective to substitute for POM 4500 .

Supply Chain Management (SCM) Specialization

Minimum of 23 Credits

Specialization Adviser: *Henry Aigbedo*

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.

Required for OM Major:

- POM 3430 - Operations Management (4)
- POM 3990 - Achieve III - Operations Management (0)

Required for Supply Chain Specialization:

- POM 4410 - Operations Analytics
- POM 4420 - Supply Chain Management (3)
- POM 4430 - Operations Planning and Control (3)
- POM 4900 - Procurement and Global Sourcing (3)
- MKT 4220 - Marketing Logistics and Supply Chain Management

Electives:

Choose one (1) from the list of Electives

- POM 4350 - Service Operations Management (3)
- POM 4400 - Process Management (3)
- POM 4480 - Project Management (3)

- POM 4900 or HRD 4600 - Lean Kaizen in Organizations (4)
- QMM 4900 - Management Science (3)
- QMM 4520 - Forecasting (3)

Students who are on a previous catalog can count POM 4410, MKT 4220 and MKT 4900 as requirements for the Supply Chain Specialization.

Lean and Quality Management Specialization

Minimum of 23 Credits

Specialization Advisor: *Eugene Fliedner*

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.

Required for OM Major:

- POM 3430 - Operations Management (4)
- 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 4900 (HRD 4600) - Lean Kaizen in Organizations (4)
- ACC 3200 - Managerial and Cost Accounting II (3)

Electives:

Choose one (1) from the list of Electives

- POM 4350 - Service Operations Management (3)
- POM 4420 - Supply Chain Management (3)
- POM 4480 - Project Management (3)
- POM 4900 - Procurement and Global Sourcing (3)

- QMM 4400 - Management Science (3)
- QMM 4520 - Forecasting (3)

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

Project Management Specialization

Minimum of 23 Credits

Specialization Adviser: *Eugene Fliedner*

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.

Required for OM Major:

- POM 3430 - Operations Management (4)
- POM 3990 - Achieve III - Operations Management (0)

Required for Project Management Specialization:

- POM 4410 - Operations Analytics
- POM 4480 - Project Management (3)
- POM 4900 - Procurement and Global Sourcing (3)
- ACC 3180 - Accounting Information Systems: Planning and Analysis (3)
- ORG 4310 - Leadership and Group Performance (4)

Electives:

Choose one (1) from the list of Electives

- POM 4350 - Service Operations Management (3)
- POM 4400 - Process Management (3)
- POM 4420 - Supply Chain Management (3)
- POM 4430 - Operations Planning and Control (3)

- POM 4900 (HRD 4600) - Lean Kaizen in Organizations (4)
- QMM 4400 - Management Science (3)
- QMM 4520 - Forecasting (3)

Students on a previous catalog can use POM 4410 as a required course for Project Management Specialization.

Business Analytics Minor

Coordinator: *Mark Isken*

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: (MTH 1221 or MTH 1441) and (MTH 1222 or MTH 1554); QMM 2400 (or STA 2220 or STA 2226),(QMM 2410 or QMM 2500), MIS 1000 (MIS 4460 or MIS 5460), and (MIS 4470 or MIS 5470); and any two courses chosen from ECN 4050, ECN 4060, FIN 4250, MIS 4360, MIS 4500, MIS 4900,(POM 4410 or MIS 4410), QMM 4400. 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 480 or MIS 4900 or POM 480 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.

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

Information Security Management Minor

Coordinator: *Xiaodong Deng*

The minor in information security management (ISM) consists of a minimum of 12 credits 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 4180, MIS 4800 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.

Students cannot obtain both the ISM Minor and Major with ISM Specialization.

Management Information Systems Minor

Coordinator: *Vijayan Sugumaran*

The minor in management information systems (MIS) consists of a minimum of 12 credits 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 or MIS 3020), MIS 3050, MIS 3140, MIS 4050, and one 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 4180, MIS 4460, MIS 4470, MIS 4500, MIS 4700, MIS 4750, MIS 4800, MIS 5460, MIS 5630 or MIS 5640 under a previous catalog will be able to count these courses as electives.

Operations Management Minor

Coordinator: *Vijayan Sugumaran*

The minor in operations management (OM) consists of a minimum of 13 credits 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 1221 or higher, QMM 2400 or STA 2220 or STA 2226, QMM 2410 or QMM 2500, ACC 2000 , ACC 2100, POM 3430 and three courses chosen from POM 4350, POM 4400, POM 4410/MIS 4410, POM 4420, POM 4430 or POM 4480. 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 QMM 4400, POM 4410/MIS 4410, and POM 4350 under a previous catalog will be able to count these courses as an elective.

Courses

MIS 1000 - Business Problem Solving with Information Technology (3)
Introduction to the use of information technology in business problem solving and business modeling. Includes hands-on exercises using Windows, Microsoft Office (Word, Excel, PowerPoint and Access), Web browsers, and HTML.

MIS 3000 - Management Information Systems (3)
This course shows how information technology can improve business processes and help managers be more effective decision makers. Topics include network functions, database management and decision support.

Prerequisite(s): MIS 1000 or CSI 1200 with a minimum grade of (C) in each course and sophomore standing.

MIS 3010 - Survey of Management Information Systems (3)
Course focuses on the use of information systems in business. Topics include components, types and development of information systems, and uses and benefits of information systems. Relevant technology issues such as security, privacy and ethics will also be introduced. Business majors, pre-business students and business-undecided students cannot take this course. Offered each fall.
Prerequisite(s): sophomore standing and MIS 1000 or CSI 1200 with a minimum grade of (C).

MIS 3020 - Information Systems and Healthcare Informatics (3)
Introduces students to the nature of healthcare data and healthcare information management by focusing on the use of information systems in healthcare. Topics include: components, types and development of information systems in healthcare. Relevant information technology issues such as security, privacy and ethics will also be introduced.
Prerequisite(s): CSI 1200 or MIS 1000 with a minimum grade of (C) in each course.

MIS 3050 - Information Technology Foundations (3)
Covers the technology at the heart of information systems. Topics include operating systems, programming and networks. Includes hands-on projects.
Prerequisite(s): MIS 1000 or CSI 1200 with a minimum grade of (C).

MIS 3130 - Information and Data Management (3)
This course introduces the basics of information generation, management, and dissemination using spreadsheets and databases to support managerial decision-making. Students will study the principles of data modeling, the database development process, entity-relationship model, relational database and SQL. Developing database applications using modern software tools will be emphasized. Students will also examine data warehouses, as well as challenges in large-scale data integration. Course involves hands-on work and students complete case studies and projects, both individually and in teams.
Prerequisite(s): MTH 1555 and EGR 1400 (may be taken concurrently) with a minimum grade of (C) in each course.

MIS 3140 - Business Database Systems (3)
This course discusses the basic concepts in data management and the techniques used to design, implement and maintain modern database applications. It covers various approaches to data modeling, such as entity-relationship diagramming and object modeling with UML. The course also focuses on designing relational databases from data models, querying designing

forms, and generating reports. Students are also exposed to contemporary topics such as data warehousing, data mining, and web databases. Includes projects.
Prerequisite(s): MIS 3000 or MIS 3010, and MIS 3050 with a minimum grade of (C). MIS 3050 may be taken concurrently.

MIS 3990 - Achieve III - Management Information Systems (0)
Guide students through job search process within the Management Information Systems major.
Prerequisite(s): major standing and SBC 1990 and SBC 2990

MIS 4050 - Business Systems Analysis and Design (3)
Introduces the software development life cycle and information requirements analysis. Examines process modeling with UML methods and use case analysis. Exposes students to contemporary methodologies for the analysis, design, and development of information systems. Emphasizes system design (translating requirements specifications and process models into design specifications using object-oriented techniques), interface design, and software testing. Includes projects.
Prerequisite(s): MIS 3050 and MIS 3140 with a minimum grade of (C) in each course, and major standing.

MIS 4060 – Managing Information Projects (3)
Examines issues involved in managing information projects including project scheduling, measurement, assessment, budgeting and human resource management issues.
Prerequisite(s): MIS 4050 with a minimum grade of (C).

MIS 4130 - Networks (3)
Technology, design, management, and use of data, voice, image, and video communication networks. Topics include local area networks, wide area networks, telephone systems, electronic mail, transborder data flows and communications protocols. Includes exercises using various network configurations.
Prerequisite(s): MIS 3000 or MIS 3010 and MIS 3050 with a minimum grade of (C) in each course.

MIS 4140 - Information Security Lab (3)
This course seeks to improve the students' understanding of the field of information security and assurance with coverage of recent innovations and methodologies for security infrastructure design and implementation, computer forensics, risk assessment and analysis of security requirements of a business operation, while allowing them to apply the basics of their security knowledge in a hands-on laboratory environment.

Prerequisite(s): MIS 3000 or MIS 3010 and MIS 3050 with a minimum grade of (C) in each course.

MIS 4180 - IS Risk Analysis and Controls Development (3)
This course introduces the fundamental concepts and techniques for conducting risk analysis of an information system and, then, developing security controls for the system. The major topics include information assets classification, risk identification, risk assessment, security controls design, security control implementation, and maintenance and monitoring. Involves projects.
Prerequisite(s): MIS 3000 or MIS 3010 and MIS 3050 with a minimum grade of (C) in each course.

MIS 4200 - Electronic Commerce (3)
This course provides students with an analytical and technical framework to understand the emerging world of e-commerce. Topics include the complexities of the marketplace, design and implementation of an Internet business, and issues surrounding privacy, security, and the protection of intellectual property on the Internet.
Prerequisite(s): MIS 3050 with a minimum grade of (C).

MIS 4220 - Business Object Development (3)
The primary focus of the course is on the principles and applications of object-oriented methods in information systems. Object-oriented concepts and software design and programming principles will be introduced. The purpose of the course is to train students to write reasonably complex business application programs using higher level languages such as Java.
Prerequisite(s): MIS 3000 and MIS 3050 with a minimum grade of (C) in each course.

MIS 4240 - Business Application Architecture (3)
This course focuses on issues related to server-side aspects of web-based applications. It introduces several solution architectures and their relative advantages and disadvantages. Server-side technologies are introduced, such as Java Servlets, Java Server Pages and Java Beans. This project-based course allows students to design and build server-side applications.
Prerequisite(s): MIS 4220 with a minimum grade of (C).

MIS 4260 - Business Application Technology (3)
Students develop business applications with current tools. Topics include client/server systems, user interaction, validation, event-driven programming, and interacting with databases. The course emphasizes hands-on projects.
Prerequisite(s): MIS 3050 with a minimum grade of (C).

MIS 4360 - Decision Support Systems (3)
Using data, model and information systems to support managerial decision making.
Prerequisite(s): MIS 3000 or MIS 3010 or MIS 3020; and MIS 3050 with a minimum grade of (C) in each course.

MIS 4410 - Operations Analytics (3)
This course focuses on modeling and analyzing business operations using computer simulation including discrete event, Monte-Carlo, and systems dynamics. Topics include simulation modeling, input and output analysis, and managing simulation projects. The course includes hands-on work related to application of computer simulation modeling in the context of managerial decision making under uncertainty and designing business processes. Cross-listed with POM 4410.
Prerequisite(s): QMM 2410 and POM 3430 with a minimum grade of (C) in each course.

MIS 4460 - Business Analytics (3)
Introduces a range of topics, tools and technologies for modeling, analysis and visualization of business related data using spreadsheets. In addition to providing an introduction to more advanced analytics techniques such as simulation, optimization and data mining, students learn the basics of Excel VBA programming for creating spreadsheet based analysis tools.
Prerequisite(s): (QMM 2410 or STA 2226) and (MIS 1000 or CSI 1200) with a minimum grade of (C) in both courses.

MIS 4470 - Practical Computing for Data Analytics (3)
This course provides hands-on experience necessary to analyze and identify patterns and insights from large business data sets. Programmatic analytical tools such as R, Python and SAS will be introduced. Data warehousing and analytics tasks such as data acquisition, data cleansing and preparation, analysis and visualization and communication of the results will be emphasized. Students will also be exposed to building, training and testing various machine learning, data mining and statistical models.
Prerequisite(s): QMM 2410 or STA 2226 and MIS 3050 or MIS 4460 with a minimum grade of (C) in both courses.

MIS 4500 - Web Analytics (3)
This course will introduce web analytics terminology and the implementation of various web analytics tools. It will also examine the analysis/interpretation of web metrics data, the implementation and measurement of web marketing strategies, and how to take action based on web metrics. The course work will include case studies, data analysis and interpretation, and the implementation of web analytics tools on sample websites.
Prerequisite(s): MIS 3000 or MIS 3010 with a minimum grade of (C).

MIS 4520 - Computer and Network Security (3)
This course focuses on fundamentals of network and computer security technologies. It also explores management and implementation of these technologies in multi-user computer systems (such as LANs) and distributed computer systems (such as the Internet). The course may be taken by either undergraduate or graduate students.
Prerequisite(s): MIS 3050

MIS 4700 - IS Security (3)
This course addresses issues pertaining to ensuring the security of organizational and personal information systems. Topics include: cryptography, analysis of threats, problems particular to networks, vulnerability and risk assessment, identification and authentication, certificates, credentials, organizational security policies, and the human factors.
Prerequisite(s): MIS 3000 or MIS 3010 and MIS 3050 with a minimum grade of (C) in each course.

MIS 4750 - Mobile Security and Secure Application Development (3)
This course presents fundamental concepts of wireless security and the use of mobile apps in organizations. It introduces how to design and code secure mobile apps with PHP and SQL. Involves projects.
Prerequisite(s): MIS 3000 or MIS 3010 and MIS 3050 with a minimum grade of (C) in each course.

MIS 4800 - Information Security Project (3)
This course introduces a Cyber Security Framework that organizations can use to implement a sound information security program. It will provide hand-on experience with tools, techniques and processes including lab exercises, demos, case studies and homework assignments. Emphasis on how to interpret an information security framework and build it into a measurable and effective security program.
Prerequisite(s): MIS 3000 or MIS 3010 and MIS 3050 and MIS 4180 with a minimum grade of (C) in each course. MIS 4180 may be taken concurrently.

MIS 4900 - Special Topics in MIS (3)
A class in a topic of interest to a faculty member such as ecommerce, artificial intelligence, Java or ethics. Topics vary. See Schedule of Classes for current offerings. May be repeated for a total of six credits as long as topic is different.
Prerequisite(s): MIS 3000 and MIS 3050 with a minimum grade of (C) in each course.

MIS 4996 - Independent Study (1 TO 3)

Qualified and highly motivated students may engage in individual research, directed readings or group study under the supervision of a faculty member. Offered every term. May be repeated for a total of six credits.
Prerequisite(s): overall (3.0) GPA and approved contract.

POM 3000 - Survey of Operations Management (3)
This course introduces the student to the operation of both manufacturing and service organizations. Topics included are capacity planning, facility location and layout, production control and scheduling and quality assurance. Business majors, pre-business students and business undecided students cannot take this course. Offered every other winter semester.
Prerequisite(s): junior standing.

POM 3430 - Operations Management (4)
Study of operations of manufacturing and service organizations. Introduction to operational design and control issues such as forecasting, capacity planning, facility location and layout, production control, material requirements planning, scheduling and quality assurance. Includes international, legal and ethical aspects.
Prerequisite(s): QMM 2400 or QMM 2410 or QMM 2500 or STA 2226 or STA 2220 and ACC 2100 with a minimum grade of (C) in each course.

POM 3990 - Achieve III - Operations Management (0)
Guide students through the job search process within the Operations Management major.
Prerequisite(s): major standing and SBC 1990 and SBC 2990

POM 4350 - Management of Service Operations (3)
This course seeks to improve the student's understanding of the nature of organizations that produce services in addition to, and instead of, goods. It explores some of the operating and other management issues, problems, and decisions found in such organizations. The course takes a general management viewpoint with a bias towards operations, marketing, and human resource management. It establishes a framework for the evaluation of existing and new service concepts and examines similarities and differences between management in the service and manufacturing sectors. It exposes students to important service concepts and practices and makes us aware of problems, issues, and opportunities in the service sector.
Prerequisite(s): POM 3430 with a minimum grade of (C).

POM 4400 - Process Management (3)
This course examines the management of business processes in order to attain objectives including productivity enhancement, cost reduction and quality improvements. Organizational

efforts to continuously improve processes and enhance customer satisfaction are examined with a primary focus on the complementary subjects of Lean and Total Quality Management (TQM). Special topics such as leadership styles: costs of quality; employee empowerment, participation, and teamwork; statistical process control tools; process improvement techniques; product design; variance reduction; value and non-value adding activities; waste eliminating; and numerous lean practices and tools will be examined.
Prerequisite(s): POM 3430 with a minimum grade of (C).

POM 4410 - Operations Analytics (3)
This course focuses on modeling and analyzing business operations using computer simulation including discrete event, Monte-Carlo, and systems dynamics. Topics include simulation modeling, input and output analysis, and managing simulation projects. The course includes hands-on work related to application of computer simulation modeling in the context of managerial decision making under uncertainty and designing business processes. Cross-listed with MIS 4410.
Prerequisite(s): QMM 2410 and POM 3430 with a minimum grade of (C) in each course.

POM 4420 - Supply Chain Management (3)
This course will examine several issues on effective management of today's supply chains. They include planning and design for supply chains, mass customization and postponement, distribution networks, management of supplier relationships, benefits/challenges of global sourcing, management of supply chain risks, integration and evaluation of supply chains.
Prerequisite(s): POM 3430 with a minimum grade of (C)

POM 4430 - Operations Planning and Control (3)
Studies the economic conversion of inputs into goods and services for both manufacturing and service organizations. Managerial and technical aspects of planning and controlling resources within a transformation system are examined including demand management, lean manufacturing, master production scheduling, materials requirements planning, capacity planning and inventory control.
Prerequisite(s): POM 3430 with a minimum grade of (C)

POM 4480 - Project Management (3)
Project management topics examined will include: project selection, project plan elements including statements of work, scope statements, budgets, alternative organizational structures, work breakdown structures, the role of the project manager, leadership styles, teamwork approaches, conflict resolution, schedule development and risk management. Project monitoring and control and project termination will be investigated as well.
Prerequisite(s): POM 3430 with a minimum grade of (C).

POM 4500 - Operations Strategy (3)
This capstone course examines the formulation and implementation of an operations strategy as part of overall business strategy. It will examine managing operations of competitive advantage (cost, quality, speed, and flexibility) in service and manufacturing firms. Cases are used to illustrate various concepts. Only offered winter terms.
Prerequisite(s): POM 3430 and POM 4430 and POM 4350 or POM 4400 or POM 4420 or POM 4480 or QMM 4400 with a minimum grade of (C) in each course and major standing.

POM 4900 - Special Topics in Operations Management (3)
Intensive study of a selected topic in production/operations management. Topics vary. See Schedule of Classes for current offering. May be repeated for a total of six credits as long as the topic is different.
Prerequisite(s): POM 3430 with a minimum grade of (C)

POM 4996 - Independent Study (1 TO 4)
Qualified and highly motivated students may engage in individual research, directed readings or group study under the supervision of a faculty member. Offered every term. May be repeated for a total of eight credits.
Prerequisite(s): overall (3.0) GPA and approved contract.

QMM 2400 - Statistical Methods for Business I (3)
Descriptive statistics, probability, probability distributions, sampling distributions, estimation, and hypothesis tests. Emphasizes business applications and computer analysis of data. Includes report writing and computer projects, and presentations. *Satisfies the university general education requirement in the knowledge applications integration area. Prerequisite for knowledge applications: completion of the general education requirement in the formal reasoning knowledge foundation area.*
Prerequisite(s): MTH 1221 or MTH 1222 or MTH 1441 or MTH 1554 and MIS 1000 or CSI 1300 with a minimum grade of (C) in each course, and sophomore standing.

QMM 2410 - Statistical Methods for Business II (3)
Continuation of QMM 2400. Analysis of variance, nonparametric statistics, correlation, regression, statistical process control, and time series analysis. Emphasizes business applications and computer analysis of data. Includes report writing, computer projects, and presentations. *Satisfies the university general education requirement in the knowledge applications integration area. Prerequisite for knowledge applications: completion of the general education requirement in the formal reasoning knowledge foundation area.*

Prerequisite(s): MTH 1222 or MTH 1554 and STA 2220 or STA 2226 or QMM 2400 with a minimum grade of (C) in each course, and sophomore standing.

QMM 2500 - Statistical Methods for Business (6)
Covers the same topics as QMM 2400 and QMM 2410 combined. Intended for motivated students with good writing and analytical skills. *Satisfies the university general education requirement in the knowledge applications integration area. Prerequisite for knowledge applications: completion of the general education requirement in the formal reasoning knowledge foundation area.*
Prerequisite(s): MTH 1222 or MTH 1554 and MIS 1000 or CSI 1300 with a minimum grade of (C) in each course and sophomore standing.

QMM 4400 - Management Science (3)
This is a survey course of management science topics such as Decision Trees, Linear Programming, Transportation and Scheduling Models, Linear and Logistic Regression, Markov Chains and Queuing. Course emphasis is on problem formulation or drawing the link between a business problem and a mathematical model that allows studying or optimizing the business process. The course uses standard software tools and meets in a computer lab.
Prerequisite(s): QMM 2410 or QMM 2500 with a minimum grade of (C) in each course.

QMM 4520 - Forecasting (3)
Survey of time-series forecasting methods used in business, including trends, exponential smoothing, decomposition, ARIMA, and neural nets. Econometric topics include seasonal binaries, autocorrelation, and lagged variables. Includes case studies and discussion of current economic conditions. Computer tools are used for individual and team projects.
Prerequisite(s): QMM 2410 or QMM 2500 with a minimum grade of (C) in each course.

QMM 4900 - Special Topics in Quantitative Methods (3)
An advanced course involving study of current issues and recent developments in Quantitative Methods. Topics vary. See Schedule of Classes for current offering. Course may be repeated for a maximum of 6 credits. Same topic cannot be repeated.
Prerequisite(s): QMM 2400 or QMM 2410 or QMM 2500 or STA 2220 or STA 2226 with a minimum grade (C) in each course.

QMM 4996 - Independent Study (2 OR 4)
Qualified and highly motivated students may engage in individual research, directed readings or group study under the supervision of a faculty member. Offered every term. May be repeated for a total of 8 credits.
Prerequisite(s): overall GPA of (3.0) or better and an approved contract.

Department of Management and Marketing

Department Chair: *Janell Townsend*

General Management Program Adviser: *Cynthia Miree-Coppin*

Human Resources Management Program Adviser: *Lizabeth Barclay*

Marketing Program Adviser: *John Kim*

Schedule of classes

Specific offerings for each semester may be found in the Schedule of Classes.

Programs

- Business Administration, General Management Major, B.S.
- Business Administration, Human Resources Management Major, B.S.
- Business Administration, Marketing Major, B.S.
- Business Minor
- Entrepreneurship Minor
- Human Resources Management Minor
- International Management Minor
- Marketing Minor

Business Administration, General Management Major, B.S.

Requirements for the major in general management

Major adviser: *Cynthia Miree-Coppin*

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.

Required major course

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

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

Requirements for the major in human resources management

Major adviser: *Lizabeth Barclay*

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.

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 **(4)**
- MGT 4900 - Seminar: Current Business Topics **(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 wishing to earn a 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

    a. HRME contract -

        - Student must receive HRM faculty adviser approval prior to beginning the work experience.
        - For students wishing 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. You may have to provide additional support when using previous experience for this requirement.
        - The student's work experience must meet the minimum contact hours requirement (280 hours).

    b. 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

Major adviser: *John Kim*

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 and execute the conception, pricing, promotion, and distribution of ideas, goods and services by creating exchanges which satisfy individual and organizational goals. The program includes broad coverage of such topics as marketing management, marketing research, selling and sales management, advertising and communications, sales promotion, business-to-business marketing, not-for-profit marketing, business logistics, retailing, international marketing and internet 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 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 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 takenMKT 4210 , MKT 4220 ,MKT 4400 , or MKT 4600 will be able to count these courses toward an elective requirement.

Required in the core -- 4 credits

- MKT 3020 - Marketing **(4)**

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 4210 - Distribution Channels Management and Retailing **(3)**
- MKT 4220 - Marketing Logistics and Supply Chain Management **(3)**
- MKT 4300 - Personal Selling **(3)**
- MKT 4400 - Product Innovation and Management **(3)**
- MKT 4500 - International Marketing **(3)**
- MKT 4600 - Entrepreneurial Marketing **(3)**
- MKT 4700 - Business to Business Marketing **(3)**
- MKT 4900 - Seminar in Marketing **(3)**

25 total credits

Business Minor

Coordinator: *Jennifer Thor*

The minor in business consists of a minimum of 20 credits, described as follows, and any prerequisites for these courses: (Take six of the following seven choices) ECN 1500 (or ECN 1600 or ECN 2000 or ECN 2010 or ECN 2020 or ECN 2100), FIN 3000, ACC 3000 (or ACC 2000), MKT 3000, MIS 3010, MGT 3000, and POM 3000. 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. Students selecting the business minor cannot earn any other SBA minor. None of the 3000-level courses in this minor can be used to fulfill the requirement of any other SBA major or minor. In addition, none of the 3000-level courses can 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.

Entrepreneurship Minor

Coordinator: *Jae Kang*

This minor helps business and non-business majors launch successful new ventures. For business majors, the minor consists of a minimum of 15 credits including two required courses ENT 3010, ENT 4400, and two elective courses including either ENT 3050, MKT 4400 , MKT 4600 , MGT 4540, ORG 4310 or ENT 4900. For non-business majors, the minor consists of a minimum of 23 credits and six courses. This includes ENT 2010 and ENT 2020 to help prepare the non-business major for the rest of the program. A minimum grade of C must be earned in each course and in the prerequisites for each course. This minor is open to all students.

Human Resources Management Minor

Coordinator: *Kenneth M. York*

The minor in human resources management consists of a minimum of 18 credits, described as follows: ORG 3300, ORG 3310 and ORG 4340 and eight additional credits 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.

International Management Minor

Coordinator: *Joy Jiang*

The minor in international management consists of a minimum of 14 credit hours for business students and 20 credit hours for students from all other majors, along with any prerequisites for these courses.

All business majors: ECN 3730 (3), MGT 4230 (4), and MGT 4250 (4), plus one area elective required; choose from ECN 3260 (3), ECN 3740 (3), FIN 4190 (3), MKT 4500 (3), or ORG 4700 (4).

All non-business majors: ECN 2020 (4), ENT 2010 (4), ENT 2020 (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

Coordinator: *John Kim*

The minor in marketing consists of a minimum of 19 credits, described as follows: MKT 3020, MKT 4040, MKT 4050, MKT 4530 and one course chosen from MKT 4060, MKT 4210 , MKT 4220 , MKT 4300, MKT 4400 , MKT 4500 , MKT 4600 , MKT 4700, MKT 4900, and 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 4210, MKT 4220, MKT 4400, or MKT 4600 will be able to count these courses toward an elective requirement.

Courses

ENT 2010 - Prep for Entrepreneurship 1 (4)
This course introduces students to accounting, finance and economic issues most relevant to entrepreneurs. It is only required of non-business students. MIS 1000 or CSI 1200 recommended.
Prerequisite(s): sophomore standing.

ENT 2020 - Prep for Entrepreneurship 2 (4)
This course introduces students to Marketing, MIS, POM and Organizational issues most relevant to entrepreneurs. It is only required of non-business students. MIS 1000 or CSI 1200 are recommended.
Prerequisite(s): sophomore standing.

ENT 3010 - Developing New Venture Ideas (4)
Provides an overview of different types of entrepreneurial business models and endeavors, thereby helping students determine the entrepreneurial path that best suits their goals, interests and skills. The course also teaches general entrepreneurial success principles and how to avoid common mistakes.
Prerequisite(s): Non-business students: ENT 2010, ENT 2020 with a minimum grade of (C). Business students: QMM 2400 or QMM 2500 or STA 2220 or STA 2226, ECN 2020 or [ECN 2000 or ECN 2100], ACC 2100, MIS 1000 or CSI 1300, MKT 3020 with a minimum grade of (C).

ENT 3050 - The Psychology of Creativity and Innovation (4)
Introduces writings from various disciplines that elucidate the nature and function of creativity and the conditions that stimulate it. Includes writing, design assignments and group projects. Discussions include non-traditional thinking, receptivity, risks, ethics, personal mastery and social responsiveness.

ENT 4400 - New Venture Creation (4)
Explores the process for creating new ventures, including ideation, evaluation of business opportunities, business planning, financial planning, financial analysis, and assembling business resources. Students will focus on integrating all aspects of a start-up while recognizing the external environment. Other concepts include competitive analysis, competitive positioning, market segmentation, and issues related to launching new ventures. ENT 3010 and MKT 4600 recommended.
Prerequisite(s): Non-business students: ENT 2010, ENT 2020 with a minimum grade of (C). Business students: QMM 2400 or QMM 2500 or STA 2220 or STA 2226, ECN 2020 or ECN 2000 or ECN 2100, ACC 2100, MIS 1000 or CSI 1300, MKT 3020 with a minimum grade of (C).

ENT 4900 - Seminars in Entrepreneurship (4)
Study of selected topic or current issue relevant to the practice of entrepreneurship. Topics may include Social Entrepreneurship, Family Businesses, High Tech Entrepreneurial Ventures or any area not covered by a specific course. May be repeated for a total of 8 credits. ENT 3010 is recommended.
Prerequisite(s): Non-business students: ENT 2010, ENT 2020 with a minimum grade of (C). Business students: QMM 2400 or QMM 2500 or STA 2220 or STA 2226, ECN 2020 or ECN 2000 or ECN 2100, ACC 2100, MIS 1000 or CSI 1300, FIN 3220, MKT 3020 with a minimum grade of (C).

MGT 1100 - Contemporary World Business (4)
This course introduces students to the global business environment. It focuses on how differences in economic systems, national culture, socio-demographics, and political orientations affect business operations. It also provides an introduction to key business activities. *Satisfies the university general education requirement in the global perspective knowledge exploration area. Satisfies the university general education requirement for a writing intensive course in general education.*
Prerequisite(s): completion of the university writing foundation requirement. Course is only recommended for non-SBA majors or business students who have not achieved major standing.

MGT 2350 - Commerce in Western Civilization (3)

Traces the development of commerce throughout Western Civilization within the context of continuously evolving political, social, cultural and ethical institutions, philosophies and beliefs that define and legitimize the conduct of business and industry within society. The course examines the complex inter-relationships among these institutions, values and beliefs, and how these have affected the development of commerce in Western Civilization to its modern industrial form. Satisfies the general education requirement in the western civilization knowledge exploration area.

MGT 3000 - Survey of Management (3)
Course covers traditional business management ideas, recent management thinking, and their application to the management functions of planning, organizing, leading and controlling. Course provides survey of topics such as goal setting, managerial decision making, design of organizations, corporate culture, and organizational change and development.
Prerequisite(s): Sophomore standing. Open to non-business students only.

MGT 3500 - Legal Environment of Business (3)
The legal framework of business decisions. Introduction to the legal system and a survey of government regulation of business. Legal, ethical and political issues in employment, consumer protection, antitrust and business associations.
Prerequisite(s): COM 2000 or COM 2403 with a minimum grade of (C) and junior standing.

MGT 3990 - Achieve III - General Management (0)
Guide students through the job search process within the General Management major.
Prerequisite(s): major standing and SBC 1990 and SBC 2990

MGT 4230 - International Business (4)
Analysis of the scope, structure and environment - social, cultural, political, legal, economic and technological- of international business. Emphasizes the roles played by the various business functions, in presenting an integrated view of how managers of multi-national firms cope with the complex international environment.
Prerequisite(s): [ECN 2010 and ECN 2000 or ECN 2020] or ECN 2100, junior standing students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

MGT 4250 - Global Business Strategy (4)
The course is developed as a capstone to the undergraduate international management minor, where all facets of knowledge acquired through foundational classes is used to analyze, assess, and formulate strategic plans to address the complex issues in the global marketplace.
Prerequisite(s): MGT 4230 with a minimum grade of (C)

MGT 4350 - Management Strategies and Policies (4)
Covers the concepts, methodologies and analytical tools used by managers to formulate and implement a firm's strategy. This course also explores the complexities of a firm's internal and external environment and applies knowledge from economics, accounting, finance, POM, marketing, HRM and organization behavior to understand appropriate competitive behavior and resultant firm performance. *Satisfies the university general education requirement for a writing intensive course in general education or in the major, not both. Prerequisite for writing intensive: completion of the university writing foundation requirement. Satisfies the university general education requirement for the capstone experience.*
Prerequisite(s): [WRT 3082 or ENG 3110] and MKT 3020, ORG 3310, FIN 3220, POM 3430 with a minimum grade of (C) in each course, major standing and senior standing. One of the five prerequisites for this course may be taken concurrently with MGT 4350. For SBA majors only.

MGT 4540 - Business Entities (4)
This course emphasizes appropriate selection, formation and operation of the six basic forms of business entity organization. Particular focus is upon issues such as insurance, licensing, capitalization, valuation, distributions, redemptions, formation documentation, annual reporting, state and federal taxation, dissolution, choosing professional assistance, intellectual property, restrictive covenants, employment handbooks, employment agreements, common operating documents, and federal laws affecting entity operation. ENT 3010 is recommended.
Prerequisite(s): Sophomore standing. Non-business students: ENT 2010, ENT 2010 with a minimum grade of (C). Business students: QMM 2400 or QMM 2500 or STA 2220 or STA 2226, ECN 2020 or ECN 2000 or ECN 2100, ACC 2100, MIS 1000 or CSI 1300 with a minimum grade of (C).

MGT 4700 - Business Management Ethics (4)
This course will examine business ethics from a management perspective. Both duty-based and outcome based ethical theories will be discussed. Students will utilize behavioral ethics theories to find solutions for unethical behavior in the workplace. Ethical decision making models will be explored and a concentration on stakeholders will be emphasized.
Prerequisite(s): Junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

MGT 4900 - Seminar: Current Business Topics (4)
The analysis of topics of current interest in management. Outside faculty and managers may participate in the seminar as an integral part of the course. May be repeated for a total of 8 credits.
Prerequisite(s): Junior standing and students without major standing in the SBA must have a

cumulative GPA of 2.6 or better to take this class. Additional prerequisites may be required depending on the type of course being offered.

MGT 4996 - Independent Study (1 TO 4)
Qualified and highly motivated students may engage in individual research, directed readings or group study under the supervision of a faculty member. Offered every term. May be repeated for a total of 8 credits.
Prerequisite(s): an overall GPA of (B) or better, junior standing, major standing in the SBA and an approved contract prior to registration.

MKT 3000 - Survey of Marketing (4)
This course introduces students to marketing from multiple perspectives: societal, managerial, business, not-for-profit, etc. Serves as foundation to the introductory marketing course if the student opts for a marketing major later. Course is not open to students who are pre-business, business undecided, or business majors.
Prerequisite(s): sophomore standing.

MKT 3020 - Marketing (4)
Analysis of the principles of marketing, marketing concepts and trends, and their relationship to other business principles. Special emphasis is placed on the study of the marketing mix.
Prerequisite(s): ECN 1500 or ECN 2010 or ECN 2100 and WRT 1060 and QMM 2400 or STA 2220 or STA 2226 with a minimum grade of (C) in each course. Students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

MKT 3990 - Achieve III - Marketing (0)
Guide students through the job search process within the marketing major.
Prerequisite(s): major standing and SBC 1990 and SBC 2990

MKT 4040 - Consumer Behavior (4)
Study of factors influencing consumer behavior, structuring and managerial use of consumer decision-making models. Examination of social, psychological and economic variables of buying behavior, including learning, motivation, attitude, personality, small group dynamics, demographic and economic factors and culture.
Prerequisite(s): MKT 3020 with a minimum grade of (C), junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

MKT 4050 - Marketing Research (4)
Focuses on the generation and management of information in marketing decisions. Covers the evaluation of additional marketing information, how it is acquired and used, the manager's role

in market research and the researcher's role in supplying marketing information.
Prerequisite(s): MKT 3020, MKT 4040, and QMM 2410 or QMM 2500 with a minimum grade of (C) in each course, junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class. MKT 4040 and/or QMM 2410 may be taken concurrently with MKT 4050.

MKT 4060 - Integrated Marketing Communications (3)
A review of the selection and integration of advertising, promotion, public relations and personal selling budgets. Focused on understanding the whole process from planning to evaluating campaign results.
Prerequisite(s): MKT 3020 with a minimum grade of (C), junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

MKT 4210 - Distribution Channels Management and Retailing (3)
This course focuses on the management of inter-organizational channel systems. Distribution channels will be analyzed as social, economic and political systems. Special attention will be given to channel behavior, the role of the marketing mix in channel management, and the management of retailing efforts. As a part of this course, students will be exposed to distribution channels management practices and retailing through a variety of teaching approaches. This course seeks to foster the development of strategic channel management skills.
Prerequisite(s): MKT 3020 with a minimum grade of (C), junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

MKT 4220 - Marketing Logistics and Supply Chain Management (3)
The focus of this course will be on the various dimensions of logistics, which together constitute a very large part of supply chain management. As a part of this course, Participants will be exposed to logistics management practices through a variety of teaching approaches. This course seeks to foster the development of logistics management skills that contribute to the development of strategic supply chain management skills.
Prerequisite(s): MKT 3020 with a minimum grade of (C), junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

MKT 4300 - Personal Selling (3)
Focuses on the activities of personal selling in consumer and industrial markets. Emphasis is on the processes salespeople should follow when interacting with customers and prospects to ensure the needs of customers are successfully met.
Prerequisite(s): MKT 3020 with a minimum grade of (C), junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

MKT 4400 - Product Innovation and Management (3)
This course focuses on the development and management of new products from a marketing perspective. It investigates various stages of the new product develop process, such as concept generation, project evaluation, development and product launch, and the role of marketing in making new products more successful. The structure of the course is designed to help you understand the management issues involved in the process of new product development, and develop strategic thinking and learn tools and techniques to make better decisions in the management of new products.
Prerequisite(s): MKT 3020 with a minimum grade of (C), junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

MKT 4500 - International Marketing (3)
The application of marketing principles to problems associated with marketing products and services to different nations. Cases in international marketing will be analyzed.
Prerequisite(s): MKT 3020 with a minimum grade of (C), junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

MKT 4530 - Strategic Marketing Management (4)
This course takes an integrated approach to marketing strategy as it relates to the firm and competitive market environments. It explores and addresses issues through multi-method techniques, including case studies. This course requires knowledge of the foundations of marketing thought and marketing research tools.
Prerequisite(s): MKT 3020, MKT 4040 and MKT 4050 with a minimum grade of (C), junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class. MKT 4050 may be taken concurrently with MKT 4530.

MKT 4600 - Entrepreneurial Marketing (3)
The course addresses the role of marketing in newer/smaller companies which usually have accumulated fewer resources to support marketing. They also often struggle to establish their credibility. Thus entrepreneurial marketing poses a unique set of marketing challenges which becomes the focus of this course. ENT 3010 is recommended.
Prerequisite(s): Business students: MKT 3020 with a minimum grade of (C), and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class. Non-Business Students may be able to take this course as part of an approved SBA minor. Permission from the minor coordinator is required before registration.

MKT 4700 - Business to Business Marketing (3)
The study of the interaction of businesses with one another in the buying and selling of goods that facilitate the production process or are used as components in the goods manufactured by

the buying firm. Focus is on how business-to-business marketing decisions are or should be made in the business environment.
Prerequisite(s): MKT 3020 with a minimum grade of (C), junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

MKT 4900 - Seminar in Marketing (3)
Study of a selected topic or current marketing interest relevant to marketing management. Topics may include retail management, new product development, web marketing, e-commerce, services marketing or any area not covered by a specific course. May be repeated for a total of 8 credits. Additional prerequisites may be required depending on the type of course being offered.
Prerequisite(s): MKT 3020 with a minimum grade of (C), junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

MKT 4996 - Independent Study (1 TO 4)
Qualified and highly motivated students may engage in individual research, directed readings or group study under the supervision of a faculty member. Offered every term. May be repeated for a total of 8 credits.
Prerequisite(s): MKT 3020 with a minimum grade of (C), junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class. An overall GPA of (B) or better and an approved contract prior to registration is also required.

ORG 3300 - Introduction to Organizational Behavior (3)
Examination of the theoretical and empirical issues that affect the management of individual, group and organizational processes, including structure, motivation and leadership.
Prerequisite(s): [ECN 2010 and ECN 2000 or ECN 2020] or ECN 2100 with a minimum grade of (C), sophomore standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

ORG 3310 - Introduction to the Management of Human Resources (3)
Examination of applied issues relevant to the management of human resources including recruitment, selection, performance appraisal, introduction to applied research, international human resources management and organizational development. Projects applying course concepts are required.
Prerequisite(s): ORG 3300 with a minimum grade of (C), junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

ORG 3990 - Achieve III - Human Resource Management (HRME) (0)

Completion of the HR Experience Requirement.
Prerequisite(s): major standing and SBC 1990 and SBC 2990

ORG 4300 - Organizational Research Methods (4)
Use of various behavioral research strategies as input for managerial problem solving. Review of data collection and feedback procedures, including formal research designs and action research. Computer-based exercises will be required.
Prerequisite(s): ORG 3310 and QMM 2410 or QMM 2500 with a minimum grade of (C) in each course and junior standing.

ORG 4310 - Leadership and Group Performance (4)
Comprehensive examination of selected theories of leadership. Emphasis on relevant empirical evidence and application of the theories to case studies that involve leadership behavior and group functioning.
Prerequisite(s): ORG 3300, junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

ORG 4320 - Motivation and Work Behavior (4)
Analysis of individual and organizational factors affecting employee motivation, performance and satisfaction in the work environment. Topics include the role of leadership, job design, environmental variation, compensation policies, goal-setting techniques and group influences, as each affects employee attitudes and behavior.
Prerequisite(s): ORG 3300, junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

ORG 4330 - Labor/Management Relations (4)
Analysis of management/employee relations in the private and public sector. Topics include factors influencing the supply and demand for labor, evolution and governance of unions, collective bargaining and public policy.
Prerequisite(s): ORG 3310, junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

ORG 4340 - Advanced Human Resources Management (4)
Discussion of advanced topics in human resources. Topics include compensation, employee involvement, information systems, development, assessment and selection. A project is required.
Prerequisite(s): ORG 3310 and QMM 2410 or QMM 2500, with a minimum grade of (C) in each course and junior standing.

ORG 4600 - Compensation and Benefits (4)
This course introduces issues in compensation and benefit administration. It examines practice context, the criteria used for compensation and benefits, design and implementation issues. Exercises and case studies will demonstrate these concepts.
Prerequisite(s): ORG 3310 and QMM 2410 or QMM 2500 with a minimum grade of (C) in each course and junior standing.

ORG 4700 - International Organizational Behavior and Human Resources Management (4)
Examines both international organizational behavior and human resource management in order to prepare for work in a global environment. Cross-cultural training, managing global managers, compensation, labor relations and repatriation are among the topics covered. Offered every other year.
Prerequisite(s): ORG 3310, junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class.

ORG 4900 - Topics in Organizational Management (4)
Intensive study of organizational behavior and/or human resource management topics. Topics vary from term to term. Sample topics: career development, industrial health and safety, etc. May be repeated for a total of eight credits.
Prerequisite(s): ORG 3310, junior standing and students without major standing in the SBA must have a cumulative GPA of 2.6 or better to take this class. Additional prerequisites may be required depending on the type of course being offered.

ORG 4996 - Independent Study (1 TO 4)
Qualified and highly motivated students may engage in individual research, directed readings or group study under the supervision of a faculty member. Offered every term. May be repeated for a total of eight credits.
Prerequisite(s): major standing, junior standing, an overall GPA of (B) or better and an approved contract prior to registration.

Department of Economics

Department Chair: *Ronald Tracy*

Economics Program Adviser: *Ronald Tracy*

Actuarial Science Program Adviser: *Ronald Tracy*

Schedule of classes

Specific offerings for each semester may be found in the Schedule of Classes.

Programs

- Actuarial Science, B.S. **(Business Administration - Offered Jointly with CAS)**
- Business Administration, Business Economics Major, B.S.
- Economics, B.A. **(Business Administration - Offered Jointly with CAS)**
- Economics, B.S. **(Business Administration)**
- Economics Minor
- Economics Secondary Teaching Minor

Actuarial Science, B.S.

Requirements for the liberal arts 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 as well as 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 our 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 complete a minimum of 124 credits. All required and cognate courses must be completed with a minimum grade of a C.

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 Requirement

- ECN 2100 - Principles of Economics **(6)**

  or both
  ECN 2010 - Principles of Microeconomics and ECN 2020 - Principles of Global Macroeconomics
  (or ECN 2000 - Principles of Macroeconomics)
- 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)** *(Students on 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 [**ECN 4060 - Time Series Econometrics (3)**] or **STA 4330 - Time Series I (4) or STA 4228 - Introduction to Mathematical Statistics II (4)**

5. Complete Accounting and Finance Requirements

- ACC 2000 - Introductory Financial Accounting **(4)**
- FIN 3550 - Finance for Actuarial Science **(4)**

- FIN 3600 - Investment Analysis **(3)** or FIN 4250 - Financial Derivatives *(Note: students who have taken FIN 480 or FIN 425 under a previous catalog may use these courses as a substitute for FIN 3600)*

6. Complete Regression Requirements

- ECN 4050 - Econometrics **(3)** or STA 4002 - Applied Linear Models I
- ACS 4550 **- Financial Mathematics (3)**

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)**
- MIS 4460 - Business Analytics **(3)**

8. Complete one of the following electives

- APM 2555 - Introduction to Differential Equations with Matrix Algebra **(4)**

  or APM 2559 - Introduction to Differential Equations (4)

9. Complete cognate course

- WRT 3082 - Business Writing **(4)**

10. 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*)

11. Earn a minimum grade of a 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 Economics Major, B.S.

Requirements for the major in business economics

Major adviser: *Ronald Tracy*

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.

Requirements for major standing

Admission to major standing in economics requires:

1. Completion of the writing requirement.
2. Completion of the following courses, or their equivalents, with a grade of C or better in each course: ACC 2000, ACC 2100, COM 2000 (or COM 2403) MTH 1221-MTH 1222, ECN 2100 (or ECN 2000 and ECN 2010), MIS 1000, ((QMM 2400 and QMM 2410), or QMM 2500)), SBC 1990 and SBC 2990.

3. Completion of these courses with a C in each course and an overall 2.6 GPA.
4. Approval of an ''Application for Major Standing in Economics.''

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.

Required in the pre-core and core -- 9-11 credits

- ECN 2010 - Principles of Microeconomics **(4)**

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

  or
- ECN 2100 - Principles of Economics **(6)** (combines ECN 2010 and ECN 2020)
- ECN 3030 - Managerial Economics **(3)**

Required major courses -- 9 credits

- ECN 3020 - Intermediate Macroeconomics **(3)**
- ECN 3040 - Consumer and Welfare Economics **(3)**
- ECN 3990 - Achieve III - Business Economics **(0)**
- ECN 4050 - Econometrics **(3)**

Electives -- choose four courses, at least one of which is a 4000-level course -- 12 credits

- 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 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 4180 - Seminar in Economic Policy **(3)**
- ECN 4210 - Monetary Economics **(3)**
- ECN 4560 - Public Finance **(3)**
- ECN 4900 - Special Topics in Economics **(3)**

30-32 credits total

Students on a previous catalog may use 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

- 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
- MIS 1000 - Business Problem Solving with Information Technology **(3)**
- QMM 2500 - Statistical Methods for Business **(6)**

  or QMM 2400 Statistical Methods for Business I (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 2100 - Principles of Economics **(6)**

  (a 6-credit course that covers tha material of both ECN 2010 and ECN 2020)
- ECN 3020 - Intermediate Macroeconomics **(3)**
- ECN 3030 - Managerial Economics **(3)**
- ECN 3040 - Consumer and Welfare Economics **(3)**

Economics major electives

Choose six economics electives at the 3000 level or above, one or more of which must be at the 4000 level. 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, B.S.

Requirements for the bachelor of science degree with a major in economics

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Major adviser: *Ronald Tracy*

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 128 credits as follows:

English composition -- 4-8 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)

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 -- 29 credits

- MTH 1221 - Linear Programming Elementary Functions **(4)** (or MTH 1441)
- MTH 1222 - Calculus for the Social Sciences **(4)** (or MTH 1554)
- ***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.

- MIS 1000 - Business Problem Solving with Information Technology **(3)** or
- CSI 1200 - Introduction to Computing and Programming using Excel **(4)**

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

- QMM 2400 - Statistical Methods for Business I **(3)** or STA 2220 or STA 2226) and
- QMM 2410 - Statistical Methods for Business II **(3)**
- or
- QMM 2500 - Statistical Methods for Business **(6)** (a 6 credit course that covers the material of both QMM 2410 and QMM 2400)

- FIN 3220 - Managerial Finance I **(4)**

Required courses -- 18-20 credits

- ECN 2010 - Principles of Microeconomics **(4)**
- and
- ECN 2000 - Principles of Macroeconomics **(4)**

- or
- ECN 2020 - Principles of Global Macroeconomics **(4)**
- or
- ECN 2100 - Principles of Economics **(6)** (a 6-credit course that covers the material of both ECN 2010 and ECN 2020 .)
- ECN 3020 - Intermediate Macroeconomics **(3)**
- ECN 3030 - Managerial Economics **(3)**
- ECN 3040 - Consumer and Welfare Economics **(3)**
- ECN 4050 - Econometrics **(3)**

Electives -- 15-16 credits

Choose five economics electives at the 3000 level or above, one of which must be at the 4000 level. 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. FIN 4180 or QMM 4520 can be substituted for a 3000 level elective. No more than three credits in ECN 3800, ECN 4900, or ECN 4996 may be counted as economic electives.

General electives -- 23-34 credits

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128 total credits

In addition, each student seeking a Bachelor of Science with a major in economics must:

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1. Complete at least 32 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 major;
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 2100 or both ECN 2010 and ECN 2020 (or ECN 2000); and QMM 2400 (or QMM 2500);

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.

Requirements for a liberal arts minor in economics

The minor in economics consists of a minimum of 18 credits in economics courses including any prerequisites for these courses. **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.**

1. Required course(s)

- ECN 2100 - Principles of Economics **(6)**

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

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 **(3 OR 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.

Courses

ECN 1500 - Economics in Today's World (4)
Provides an overview of both macroeconomics and microeconomics. Students will learn about the law of supply and demand, economics of business, industry structure, international trade, exchange rates, inflation, unemployment, and fiscal and monetary policy. This is a survey course intended for students who desire a broad familiarity with a wide range of economic concepts. It does not provide adequate preparation for degrees in business or economics, and does not provide sufficient background for the Professional Engineering (PE) examination. Economics or business major should not take this course (see specific requirements for those majors). *Satisfies the university general education requirement in the social science knowledge exploration area. Offered every fall and winter.*

ECN 1600 - Introduction to the Global Economy (4)
Explains and analyzes the comparative advantage, free trade, barriers to trade, and exchange rates. Composition of international trade is analyzed. GDP, growth, unemployment, inflation, poverty, and income distribution are discussed. Measures of each are shown for the US, other industrialized countries, as well as emerging, and developing countries. (Generally offered every semester.) Students cannot get credit for both ECN 2020 and ECN 1600. *Satisfies the university general education requirement in the global perspective knowledge exploration area. Satisfies the university general education requirement for a writing intensive course in the major. Prerequisite for writing intensive: completion of the university writing foundation requirement.*

ECN 2000 - Principles of Macroeconomics (4)
Examines a broad range of macroeconomic concepts such as determination of national income, fluctuations in the economy, fiscal and monetary policies, money and banking, inflation and unemployment, and international economics. It also provides an introduction to a few key microeconomic concepts, such as scarcity, opportunity cost, supply and demand, and market processes. May not receive credit for ECN 2100. Also, may not receive credits for both ECN 2020 and ECN 2000. *Satisfies the university general education requirement in the social science knowledge exploration area.*
Prerequisite(s): high school algebra.

ECN 2010 - Principles of Microeconomics (4)

Provides an introduction to key microeconomic concepts. Examines operations of markets, theory of consumer demand, elasticity, organization of the firm, production and cost in the long and short runs, competition, externalities, market failures, legal and regulatory environment of business and international economics. It also explores economic perspectives on issues of ethnicity and gender in the U.S. economy. (Generally offered every semester). May not also receive credit for ECN 2100. *Satisfies the university general education requirement in the social science knowledge exploration area.*
Prerequisite(s): high school algebra.

ECN 2010H - Principles of Microeconomics (4)
Provides an introduction to key microeconomic concepts. Examines operations of markets, theory of consumer demand, elasticity, organization of the firm, production and cost in the long and short runs, competition, externalities, market failures, legal and regulatory environment of business and international economics. It also explores economic perspectives on issues of ethnicity and gender in the U.S. economy. (Generally offered every semester). May not also receive credit for ECN 2100. *Satisfies the university general education requirement in the social science knowledge exploration area.*
Prerequisite(s): high school algebra

ECN 2020 - Principles of Global Macroeconomics (4)
Examines a broad range of macroeconomic concepts such as determination of national income, short-term fluctuations in the economy and long-term economic growth, fiscal and monetary policies, money and banking, inflation and unemployment, with special emphasis on their global significance, and on international comparisons of macroeconomic attributes. The course introduces key concepts that will strengthen understanding of the interlinked global economy, such as comparative advantage, balance of trade and payments, exchange rates, barriers to free trade, international growth convergence, and the impact of cultures and norms on economic performance. Students are highly recommended to take ECN 2010 prior to taking ECN 2020. (Generally offered every semester and term.) May not also receive credit for ECN 2100. Also, may not receive credits for both ECN 2020 and ECN 2000. *Satisfies the university general education requirement in the global perspective knowledge exploration area or in the social science knowledge exploration area, not both.*
Prerequisite(s): high school algebra.

ECN 2020H - Principles of Global Macroeconomics (4)
Examines a broad range of macroeconomic concepts such as determination of national income, short-term fluctuations in the economy and long-term economic growth, fiscal and monetary policies, money and banking, inflation and unemployment, with special emphasis on their global significance, and on international comparisons of macroeconomic attributes. The course

introduces key concepts that will strengthen understanding of the interlinked global economy, such as comparative advantage, balance of trade and payments, exchange rates, barriers to free trade, international growth convergence, and the impact of cultures and norms on economic performance. Students are highly recommended to take ECN 2010 prior to taking ECN 2020. (Generally offered every semester and term.) May not also receive credit for ECN 2100. *Satisfies the university general education requirement in the global perspective knowledge exploration area or in the social science knowledge exploration area, not both.*
Prerequisite(s): high school algebra

ECN 2100 - Principles of Economics (6)
Provides an introduction to principles of macroeconomics and microeconomics, covering the same topics as ECN 2010 and ECN 2020 combined but at an accelerated pace. Intended for highly motivated students with good writing and math ability. May not also receive credit for ECN 2010 and ECN 2000 or ECN 2020. *Satisfies the university general education requirement in the social science knowledge exploration area. (Generally offered fall semester).*
Prerequisite(s): high school algebra and a GPA of (B) or better.

ECN 2500 - Economics Principles - a Mathematical Approach (4)
Analyzes the principles of microeconomics and macroeconomics using mathematics. Topics include: demand and supply, consumer theory, theory of the firm, market equilibrium, market structure, monitoring economic performance, aggregate demand and supply, macroeconomic policies, and long-run economic growth.
Prerequisite(s): MTH 1554 and MTH 1555 with a minimum grade of (C) in each course.

ECN 3020 - Intermediate Macroeconomics (3)
Deals with construction, analysis and interpretation of models of aggregate economic behavior, including the policy implications of alternative models, international interrelationships and assessment of contemporary controversies in national policy (Generally offered fall semester).
Prerequisite(s): MTH 1222 or MTH 1554 and ECN 2010 and ECN 2000 or ECN 2020 or ECN 2100 with a minimum grade of (C) in each course.

ECN 3030 - Managerial Economics (3)
Explores microeconomic theory and its application to managerial decision making. Examines consumer behavior, cost and output estimation, optimization, pricing issues in competitive and non-competitive markets, decision making under uncertainty and capital budgeting. (Generally offered every semester). *Satisfies the university general education requirements in the knowledge applications integration area except for economics majors. Prerequisite for knowledge applications: completion of the general education requirement in the social science knowledge exploration and the formal reasoning knowledge foundation areas.*

Prerequisite(s): ECN 2010 and ECN 2000 or ECN 2020 or ECN 2100 and MTH 1222 or MTH 1554 with a minimum grade of (C) in each course.

ECN 3030H - Managerial Economics (3)
Explores microeconomic theory and its application to managerial decisionmaking. Examines consumer behavior, cost and output estimation, optimization, pricing issues in competitive and non-competitive markets, decision making under uncertainty and capital budgeting. (Generally offered every semester). *Satisfies the university general education requirements in the knowledge applications integration area except for economics majors. Prerequisite for knowledge applications: completion of the general education requirement in the social science knowledge exploration and the formal reasoning knowledge foundation areas.*
Prerequisite(s): ECN 2010 and ECN 2000 or ECN 2020 or ECN 2100 and MTH 1222 or MTH 1554 with a minimum grade of (C) in each course.

ECN 3040 - Consumer and Welfare Economics (3)
The course emphasizes theories of consumer behavior and their applications to areas such as the individual and market demand curves, supply of labor, inter temporal choice of consumption, tax and public policies, and decision-making under uncertainty. Also emphasizes general equilibrium welfare economics, issues relating to equity and efficiency, the nature of public goods and externalities, consumer protection, and property rights. (Generally offered winter semester)
Prerequisite(s): ECN 3030 with a minimum grade of (C)

ECN 3090 - State and Local Public Finance (3)
Provides explanation and analysis of state and local public finance practices and problems. Topics include public goods and externalities, benefit-cost analysis, organization of sub-national governments, the budget process and state and local revenues and expenditures. (Offered with sufficient student demand).
Prerequisite(s): ECN 1500 or ECN 2010 or ECN 2100, with a minimum grade of (C)

ECN 3100 - Economics of the Environment (3)
Involves the application of the tools of economic analysis to problems of energy, ecology and the environment. Topics include externalities and public goods, optimum use of fixed national resources, limits to economic growth and ecological aspects of principal pollution problems. Generally offered winter and summer semesters of odd years.
Prerequisite(s): ECN 1500 or ECN 2010, or ECN 2100 with a minimum grade of (C)

ECN 3150 - Economics of Gender and Ethnicity (3)

Employs basic economic principles and standard economic theories to explore and analyze issues of gender and ethnicity at the domestic, national and international levels. Also focuses on gender related outcomes over time and across ethnic groupings. Key topics include: the economics of family structure; patterns of household and labor market activity; patterns of education and occupational choice; gender and ethnic earnings gaps; interplay of gender and ethnicity in the economy; theories of discrimination; and gender/ethnic issues in international perspective. *Satisfies the university general education requirement in U.S. diversity.*
Prerequisite(s): ECN 1500 or ECN 2010 or ECN 2100, with a minimum grade of (C)

ECN 3210 - Financial Markets and Economy (3)
Focuses on three areas: an introduction to banking and financial institutions, study of the U.S. financial markets (stock, bond and money markets), and the study of the impact of macroeconomic policies on the nation's economy and financial markets. (Generally offered winter semester and summer semester).
Prerequisite(s): ECN 1500 or ECN 2010 or ECN 2100 with a minimum grade of (C)

ECN 3260 - International Economic Development (3)
The main theories of economic development applied to developing countries. Topics include decision-making at the individual and macro-levels; trade strategies; fiscal, monetary and exchange policies in promoting economic development; and the role of less developed countries in the global economy. (Generally offered winter semester of even years). *Satisfies the university general education requirement for a writing intensive course in general education. Prerequisite for writing intensive: completion of the university writing foundation requirement. Satisfies the university general education requirement in the global perspective knowledge exploration area.*
Prerequisite(s): ECN 1500 or ECN 2010 or ECN 2100, with a minimum grade of (C)

ECN 3330 - History of Economic Thought (3)
Surveys the history and development of economic theory. Examines the development of classical theory, the Marxian challenge, the neo-classical refinement (marginal revolution) and the Keynesian revolution. Emphasis will be placed on the development of economics as intellectual history. (Offered with sufficient student demand).
Prerequisite(s): ECN 1500 or ECN 2020 or ECN 2000 or ECN 2100 with a minimum grade of (C)

ECN 3380 - Economics of Human Resources (3)
Surveys the nature of labor markets. Topics include labor demand and supply, education and investment in human capital, unemployment, geographic and occupational mobility of labor, and effects of race, sex and age in labor markets. (Generally offered fall semester of odd years).
Prerequisite(s): ECN 1500 or ECN 2010 or ECN 2100 with a minimum grade of (C)

ECN 3670 - Economics of Health Care (3)
Application of tools of economic analysis to the health care industry and government health care policy. Examines the impact of the special characteristics of health care and the medical services industry on the pattern of health care produced, its distribution and resource allocation within the industry. (Generally offered winter semester of even years).
Prerequisite(s): [ECN 2010 and ECN 2000 or ECN 2020] or ECN 2100 with a minimum grade of (C) in each course.

ECN 3730 - International Trade (3)
Examines classical, neoclassical and modern theories of international trade, as well as trade policies. Topics include: the relationship between economic growth and international trade, the theory and practice of commercial policy, preferential trading arrangements, international factor movements, trade under imperfect competition, and trade between unequal partners. (Generally offered every fall semester and summer semester of even years).
Prerequisite(s): [ECN 2010 and ECN 2000 or ECN 2020] or ECN 2100 with a minimum grade of (C) in each course.

ECN 3740 - Economics of Intl Finance (3)
Examines issues of balance of payments adjustment, exchange rate determination, and the open economy. Topics include: theories of payments and foreign exchange, causes of disturbances and processes of adjustments in the balance of payments of the foreign exchange market under alternative exchange rate regimes, international capital markets, foreign debt, monetary integration, and the international monetary system. The course may not be substituted for FIN 4190. (Generally offered winter semester of odd years).
Prerequisite(s): [ECN 2010 and ECN 2000 or ECN 2020] or ECN 2100 with a minimum grade of (C) in each course.

ECN 3760 - U.S. and World Economic History (3)
This course covers the economic history of the United States from colonial settlement to the present time. It examines the sources of the U.S. economic growth, the creation of an integrated national economy, changes in income distribution, the evolution of political-economic institutions, and the impact of economic development on environment. This course also provides an overview of the world economic history, shifts of economic systems, patterns of industrialization, changing fortunes of leading economic powers, relationship between developed and developing economies, and the emergence of the U.S. as the leading economic and military power.
Prerequisite(s): [ECN 2010 and ECN 2000 or ECN 2020] or ECN 2100 with a minimum grade of (C) in each course.

ECN 3780 - Economic Analysis of Law (3)
Economic analysis of basic institutions of legal systems. Emphasis is on laws that are not directly intended to regulate the economy, including property, contract, tort, criminal and procedural law. Labor and antitrust law will be discussed only tangentially. (Generally offered winter and summer semesters of even years).
Prerequisite(s): [ECN 2010 and ECN 2000 or ECN 2020] or ECN 2100 with a minimum grade of (C) in each course.

ECN 3800 - Topics in Economics (3)
Study of a selected topic in economics. Emphasis is placed on the institutional rather than the theoretical aspects of the topic. May be repeated for a total of 6 credits as long as the topic covered is different. (Offered with sufficient student demand).
Prerequisite(s): [ECN 2010 and ECN 2000 or ECN 2020] or ECN 2100 with a minimum grade of (C) in each course.

ECN 3810 - Mathematical Analysis for Economists (3)
Advanced Mathematical Analysis for Economists. This course is designed to teach students the language of mathematics and how to use it to better understand economics. Emphasis is placed on the application of mathematical concepts to economic models. The course includes, among other concepts, the mathematics of, and economic applications of equilibrium, slopes and derivatives, differentials, optimization, constrained optimization, and integration. Applications include problems in consumer and producer theory, general equilibrium, econometrics and other relevant areas.
Prerequisite(s): ECN 2010 and [ECN 2000 or ECN 2020] or ECN 2100 and [MTH 1222 or MTH 1554] with a minimum grade of (C) in each course.

ECN 3850 - Economics of Industries (3)
Study of a selected topic in economics. Emphasis is placed on the institutional rather than the theoretical aspects of the topic. May be repeated for a total of 6 credits as long as the topic covered is different. (Offered with sufficient student demand).
Prerequisite(s): [ECN 2010 and ECN 2000 or ECN 2020] or ECN 2100 with a minimum grade of (C) in each course.

ECN 3990 - Achieve III - Business Economics (0)
Guide students through the job search process within the Business Economics major.
Prerequisite(s): major standing and SBC 1990 and SBC 2990

ECN 4010 - Analyzing Markets Using Bloomberg Terminals (1)

Students use Bloomberg terminals to view and analyze data. Bloomberg Essentials shows students how to navigate the terminals. Bloomberg Market Concepts teaches students how to use the terminals to analyze data. Financial aptitude is measured using the Bloomberg Aptitude Test. Analyzing data using the terminals is demonstrated with short papers. This course cannot be used as a course for either an economics major or minor elective.
Prerequisite(s): ECN 2020 or ECN 2000
Pre/Corequisite(s): ECN 3020 or ECN 3210 or MIS 4460 or ECN 3030 with a minimum grade of (C) in each course.

ECN 4050 - Econometrics (3)
Deals with estimation and testing of economic models using regression techniques. Class time includes weekly computer lab. Topics include: identifying and correcting violations of the regression assumptions, binary variables, distributed lag models, and simultaneous equation models. Must complete prerequisites or have instructor permission. (Generally offered every fall semester).
Prerequisite(s): or Corequisites: (QMM 2410 or STA 2226) and WRT 1060 and (ECN 3030 or ECN 3810) ((Can Be Concurrent)) with a minimum grade of (C) in each course.

ECN 4060 - Time Series Econometrics (3)
Survey of econometric methods related to time series data. Topics include: distributed lag models, spurious regression, time series decomposition, stationarity, autoregressive processes, moving average processes, random walks, unit roots, serial correlation, autoregressive conditional heteroscedasticity, economic forecasting, co-integration, error correction models, vector autoregressive models, panel data methods. (Generally offered during winter semesters).
Prerequisite(s): ECN 4050 with a minimum grade of (C)

ECN 4090 - Urban and Regional Economics (3)
Explores the application of microeconomic theory and empirical analysis to: residential choice and location of economic activities; migration patterns within and across states and metropolitan areas: major urban problems such as quality of life, transportation and optimum city size; urban sprawl; and Michigan's economy. *Satisfies the university general education requirement for the capstone experience. Satisfies the university general education requirement for a writing intensive course in the major. Prerequisite for writing intensive: completion of the university writing foundation requirement. Generally offered fall semester of odd years.*
Prerequisite(s): QMM 2410 or QMM 2500 and ECN 3030 with a minimum grade of (C) in each course.

ECN 4180 - Seminar in Economic Policy (3)
Involves analysis of economic policy. Topics vary but may include resource allocation, macroeconomic stability, economic growth, energy, public choice, transitional economics, privatization, global economic interdependence and the environment. *Satisfies the university general education requirement for the capstone experience and for a writing intensive course in the major. Prerequisite for writing intensive: completion of the university writing foundation requirement. (Generally offered fall semester of even years).*
Prerequisite(s): QMM 2500 or QMM 2410 and ECN 3030 with a minimum grade of (C) in each course.

ECN 4210 - Monetary Economics (3)
Conducts a systematic treatment of monetary economics. Particular attention is paid to issues such as money demand, money supply, effects of money on the real economy (output and employment) and inflation, and effectiveness of monetary policy. *Satisfies the university general education requirement for the capstone experience. Satisfies the university general education requirement for a writing intensive course in the major. Prerequisite for writing intensive: completion of the university writing foundation requirement. (Generally offered winter semester of even years).*
Prerequisite(s): ECN 3020 with a minimum grade of (C)

ECN 4500 - Risk Management (3)
Review of interest rate theory, probability theory, and probability distributions. Development of a variety of actuarial and risk models such as contingent payment models; life contingency models; frequency, severity and aggregate claims models. Risk metrics such as standard deviation and Value at Risk (VAR). Identical with APM 4550. *Satisfies the university general education requirement for the capstone experience. Cannot be used as an elective for the economics major or minor. Usually offered during summer semesters.*
Prerequisite(s): FIN 3220 and ACC 3010 and STA 4227 with a grade of (C) or higher.

ECN 4560 - Public Finance (3)
Studies the role and impact of the public sector in a market economy. It examines government spending programs and taxes within the context of efficiency and equity. There is a strong emphasis on current policy issues. *Satisfies the university general education requirement for capstone experience. Satisfies the university general education requirement for a writing intensive course in the major. Prerequisite for writing intensive: completion of the university writing foundation requirement.*
Prerequisite(s): QMM 2410 or QMM 2500 and ECN 3030 with a minimum grade of (C) in each course.

ECN 4900 - Special Topics in Economics (3)
Involves an intensive study of a selected topic in economics. Topics vary. See Schedule of Classes for current offering. May be repeated for a total of 6 credits as long as the topic covered is different. (Offered with sufficient student demand).
Prerequisite(s): ECN 3030 with a minimum grade of (C)

ECN 4996 - Independent Study (1 TO 3)
Qualified and highly motivated students may engage in individual research, directed readings or group study under the supervision of a faculty member. Offered every semester. May be repeated for a total of 6 credits. (Offered based on individual students' needs).
Prerequisite(s): overall GPA of (B) or better and an approved contract prior to registration.

School of Education and Human Services

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415 Carlotta and Dennis Pawley Hall

(248) 370-3050

Fax: (248) 370-4202

Dean: *Jon Margerum-Leys*

Associate Dean: *Michael G. MacDonald*

Office of the Dean: *Leigh Settlemoir Dzwik, assistant dean; Richard DeMent, information technology analyst; Julie Chapie, educational technology specialist; Donna Raymond, director of reporting and certification officer; James Silvestri, digital strategy manager; David Tindall, director of development; Stephanie Lawrence, development associate; Touhue Vang, business manager/budget analyst; Catherine Wigent, director of accreditation and continuous improvement*

Adult Career Counseling Center: *Department of Counseling, Todd W. Leibert, chair; Lauren Conibear, director*

Educational Resources Laboratory: *Barbara B. Campbell, coordinator*

Ken Morris Center for the Study of Labor and Work: *Department of Organizational Leadership, Eileen Johnson, chair; Michael P. Long, faculty director*

Lowry Center for Early Childhood Education: *Department of Human Development and Child Studies, Ambika Bhargava, chair; Julie Ricks-Doneen, faculty director*

Center for Autism: *Department of Human Development and Child Studies, Ambika Bhargava, chair; Janet Graetz, director of academics; Chaturi Edrisinha, director of research; , Kristin Rohrbeck, director of outreach*

Pawley Lean Institute: *Department of Organizational Leadership, Eileen Johnson, chair; Dennis Wade, director*

Office of Public School Academies: *Judeen Bartos, executive director; Karen Lloyd, associate director; Shawna Boomgaard, manager of academic accountability; Adam LeRoy, administrative coordinator of special services;*

Reading Recovery Center of Michigan: *Department of Reading and Language Arts, John McEneaney, chair; Mary Lose, director*

School of Education and Human Services Advising: *Roberta Rea, director; Jennifer Bellini, adviser; Melanie Chamberlain, adviser; Jenna Motyka, adviser; Laurie Shano, adviser; Adrienne Spitzer, adviser*

School of Education and Human Services Counseling Center: *Department of Counseling, Todd Leibert, chair; Ashley D. Karas, coordinator*

School of Education and Human Services Reading Clinic: *Department of Reading and Language Arts, John McEneaney, chair; Tanya M. Christ, director*

School of Education and Human Services Writing Clinic: *Department of Reading and Language Arts, John McEneaney, chair; S. Rebecca Leigh, Director.*

School and Field Services: *Beth Feiten, director; Holly Carruthers, field coordinator; David Secord, partnership coordinator*

Programs Offered

The School of Education and Human Services offers programs designed to prepare students for careers in teaching, counseling, and human resource development. The programs include a Bachelor of Science in elementary education, a five-year secondary education program leading to teaching certification for selected majors, and a Bachelor of Science in human resource development. Minors in human resource development, training and development, applied leadership skills and in labor and employment studies are also available. Students considering a major in elementary education should consult the Admissions section of this catalog for specific preparation requirements.

The School of Education and Human Services also offers programs leading to the Doctor of Philosophy in reading education; Doctor of Philosophy in education with a major in counseling; early childhood education or educational leadership; the Education Specialist in school administration; the Master of Arts in counseling; the Master of Arts in Teaching in reading and language arts; the Master of Arts in Teaching in elementary or secondary education; the Master of Education in five areas: early childhood, educational leadership, higher education leadership, teacher leadership, and special education; and the Master of Training and Development. For information on these programs, see the Oakland University Graduate Catalog.

Additional Services

Adult Career Counseling Center

Located within the SEHS Counseling Center is the Adult Career Counseling Center (ACCC), which provides services for adults from the community who seek guidance in examining career possibilities. The ACCC provides computer-assisted career guidance, individual career counseling and referral services at no charge. The ACCC is located in Room 250A Pawley Hall. Graduate students in the counseling program have an opportunity to work in the ACCC as graduate assistants or practicum counselors. The ACCC can be reached at (248) 370-3092 or visit the website.

Center for Autism

The Center for Autism includes outreach services (OUCARES), academic programs and research in the field of autism. Call 248-370-3077 for more information.

Educational Resources Laboratory

The Educational Resources Laboratory, 350 Pawley Hall, (248) 370-2485, provides support for the academic, research and development activities of the School of Education and Human Services. It houses circulating collections of children's and young adult literature as well as curriculum and professional materials. Patrons are provided with a functional setting for the examination, study, research, development, production and evaluation of instructional materials and technologies. Workshops, bibliographic instruction, and reference consultation services for youth literature, K-12 curriculum, instructional technology and research strategies are available.

Galileo Institute for Teacher Leadership

The Galileo Institute for Teacher Leadership is dedicated to improving the learning of all students, elevating the education profession, enhancing the leadership skills of teachers, and fulfilling the vital role of public education in achieving a civil, prosperous and democratic

society. The commitment to the concept of developing teacher leaders, to defining what teacher leadership is and why it is so important is at the heart of the institute.

Ken Morris Center for the Study of Labor and Work

The Ken Morris Center for the Study of Labor and Work, 495C Pawley Hall, (248) 370-3124, provides teaching, research, consultation and public service activities for labor organizations and their members. It coordinates the Minor in Employment Systems and Standards and oversees other credit and non-credit courses, primarily for adult working students who are active in unions. Courses, conferences, residential-institutes and special lectures and training, are offered at on- and off-campus locations, on topics related to work, the needs of working people and labor organizations, and other areas of special concern to union members, leaders and staff.

Lowry Center for Early Childhood Education

The Lowry Center for Early Childhood Education, (248) 370-4100, offers early childhood education programming for children from 18 months to five years of age. The center is a research and training facility for students and faculty interested in child growth and development and early childhood curriculum.

Public School Academies

Authorizing excellent schools is the focus of the Oakland University Office of Public School Academies. Their strategic priority is to ensure that each Academy provides a quality education to its students, utilizes sound governing policies, and fulfills its fiscal and legal responsibilities. Oakland University Board of Trustees approved the Public School Academy Chartering Policy in 1995 for schools to be located in Wayne, Oakland and Macomb counties with the hope of making a difference in the education of children in its external environs. With nine schools in close proximity to the university, opportunities exist for OU to have an involved and active relationship with the schools, as well as to foster an atmosphere of collaboration and partnership among the academies.

Pawley Lean Institute

Designed to benefit Oakland University students, schools, nonprofits, government and industry, the Pawley Lean Institute (PLI) shares concepts and practices of Lean thinking to create leaders and learners in the university, public and private sectors, and the community.

Reading Recovery Center of Michigan

The Reading Recovery Center of Michigan, 228 Pawley Hall, (248) 370-3057, is a collaborative program with school districts across Michigan to provide literacy intervention services for children having extreme difficulty learning to read and write. As Michigan's Reading Recovery

Training Center, post-masters educators prepare to become Reading Recovery teacher leaders through a yearlong graduate level training program. In addition, certified teachers participate in a yearlong graduate level training program offered throughout the state in one of three areas - Reading Recovery®, Literacy Lessons™, or Literacy Support - and learn to design and deliver individual lessons in reading and writing for lowest performing learners. Most children make accelerative progress after 12 to 20 weeks of daily, individual, 30-minute lessons. The Oakland University center supervises the initial training and the ongoing professional development and certification of these specialist teachers and works with Michigan schools to plan for, implement, and expand a range of literacy interventions for children in their schools.

School of Education and Human Services Advising Office

The School of Education and Human Services (SEHS) Advising Office, 363 Pawley Hall, (248) 370-4182 is responsible for providing academic advising and career counseling for undergraduate and post-baccalaureate students in the Bachelor of Science degree in elementary education, secondary teacher education program (STEP), Human Resource Development, and Master of Arts in Teaching with elementary or secondary certification.

School of Education and Human Services Counseling Center

The School of Education and Human Services (SEHS) Counseling Center offers no-cost counseling to Oakland University students and the general public.

The SEHS Counseling Center works with individual adults, adolescents, and children, as well as couples, families and groups. Counseling is provided for a wide variety of daily living issues, such as anxiety, stress, grief and loss, time management, life transitions, relationship issues and behavioral issues, to name a few. The SEHS Counseling Center is equipped with career assessments to aid those in their career exploration, educational goals and job search.

All sessions are conducted by a closely supervised masters or doctoral level counselor near the end of his or her training. Sessions are professional, ethical and confidential. Clients are assigned to counselors for a semester-long time period. The center is open Monday through Saturday year-round, with the exception of university breaks. There are three ways to register for an appointment: by phone, call (248) 370-2633; in person, go to 250 Pawley Hall (second level) or register online.

School of Education and Human Services Reading Clinic

The School of Education and Human Services (SEHS) Reading Clinic, (248) 370-3054, offers tutorial and small-group instruction for children in grades one through 12 to help overcome reading difficulties. Clinics are offered once or twice each year and are staffed by experienced teachers completing the practicum phase of their master's degrees in reading and language arts. Oakland University faculty supervise each clinic. Instruction typically focuses on

comprehension, word recognition (including phonics), writing, literature, study skills and oral language.

School of Education and Human Services Writing Clinic

The School of Education and Human Services (SEHS) Writing Clinic, (248) 370-3054, offers tutorial and small-group instruction for children in grades one through eight to help children improve their writing. The Writing Clinic is offered in summer only and is staffed by experienced teachers completing the practicum phase of their master's degrees in reading and language arts. Oakland University faculty supervise the clinic. Instruction occurs over a period of seven days and typically focuses on genre, author's craft, and illustration study to develop power of expression in writing.

School and Field Services

The Office of School and Field Services, 385 Pawley Hall, (248) 370-3060, is responsible for the support and placement of pre-service field students and interns in elementary, secondary, art and music education, as well as supporting the development of clinical partnerships with area schools and districts.

Department of Counseling

491B Pawley Hall

(248) 370-4179

Fax: (248) 370-4141

Chair: *Todd W. Leibert*

Professors emeriti: *Jane S. Goodman, Luellen Ramey, Howard Splete*

Professors: *James T. Hansen*

Associate professors: *Michael P. Chaney, Jr., Stephanie Crockett, Robert S. Fink, Lisa D. Hawley, Todd W. Leibert, Brian J. Taber*

Assistant professors: *Ashley Branson, Jennifer Matthews*

Within the School of Education and Human Services, the Department of Counseling offers undergraduate courses in career exploration, crisis intervention and foundations of counseling. See the Graduate Catalog for the Master of Arts in Counseling, specializations in Mental Health Counseling, Child and Adolescent Counseling, Couple and Family Counseling, Addictions Counseling, Advanced Career Counseling, School Counseling and Wellness Counseling. A Ph.D. program is offered with a focus on any of the above cognate areas.

Courses

CNS 1010 - Educational and Career Exploration (2)
Introduction of key aspects of personal career decision making, encompassing self assessment, occupational search, and the relationship between academic majors and future career options. Use of internet and computerized career assessment systems, inventories, and exercises in exploration, planning and goal setting.

CNS 2010 - Foundations of Counseling (4)
Foundations of Counseling is a survey course in which students will become familiar with the field of professional counseling. The course covers foundations of counseling including: role of counselors in contemporary society, ethical and legal issues, basic counseling techniques, multicultural counseling, and current issues in counseling.

CNS 2020 - Integrating Academic, Career, and Professional Development (2)
This course helps nontraditional students with their unique academic and career planning decisions. Academic and career choices are framed in terms of self-knowledge, decision-making skills, life experiences, family and other personal relationships, economic status, and goals. Small group experiences and assignments provide opportunities for reflection.

CNS 3010 - Introduction to Skills of Counseling (4)
This course consists of classroom and laboratory study of basic counseling skills applicable to a variety of helping professions. Audio and video recordings of role-played sessions are used to develop listening skills and build empathy for the experience of those who are recipients of helping processes.

CNS 3020 - Lesbian, Gay, Bisexual and Transgender Issues in Counseling (4)
The purpose of this course is to enhance students' multicultural competence by introducing students to major issues associated with sexual orientation and gender identity and expression, and how these issues historically and currently are addressed in the counseling and psychological literature. Issues addressed include mental and physical health, identity development and the coming out process across the lifespan, psychosocial consequences of internalized homonegativity and heterosexism, family and relationship issues, spirituality,

affirmative counseling, and professional ethics when working with LGBTQ clients. Mental health issues associated with LGBTQ individuals' intersecting identities are also examined (i.e., race, ethnicity, gender, social status, ability etc.).

CNS 3030 - Mental Health Policy (4)
Introduction to Mental Health Policy is a survey course in which the student will become familiar with mental health policy history and current impact of mental health policy on mental health services. The course covers the foundation of government and public mental health agencies and the current implementation of policies. Special attention to the impact of policy on individuals with mental health issues, families and the structures which serve them. Historical and current mental health advocacy approaches will also be discussed. Students are expected to obtain proficiency in knowledge and professional writing through project based instruction and knowledge exams.

CNS 4040 - Crisis Intervention and the Prevention of Self Harm (4)
Provides an introduction to crisis intervention and the prevention of self harm from a health promotion perspective.

Department of Human Development and Child Studies

405B Pawley Hall

(248) 370-3077

Fax: (248) 370-4242

Chairperson: *Ambika Bhargava*

Professors emeriti: *Sandra Alber, Marc E. Briod, Gerald F. Freeman, Ronald M. Swartz*

Associate professors: *Ambika Bhargava, Chaturi Edrisinha, Janet E. Graetz, Darlene A. Groomes, Andrew S. Gunsberg, James M. Javorsky, M. Shannan McNair, Sherri L. Oden, Julie Ricks-Doneen, Erica A. Ruegg, Sunwoo Shin, Tomoko Wakabayashi*

Assistant professors: *Jessica Korneder*

Special Instructor: *Nicholas P. Lauer*

Within the School of Education and Human Services, the faculty of the Department of Human Development and Child Studies offers courses in special education at the undergraduate level for students pursuing a career in teaching. A major in early childhood education that meets the ZS endorsement requirements is available for elementary education students. The department houses master's degree programs in early childhood education and special education; these graduate programs provide endorsements and/or professional education certification requirements. The department also offers a doctor of philosophy degree in early childhood.

Courses

EC 3320 - Child Development - Birth to Age 8 (4)
This course focuses on social, emotional, cognitive, physical linguistic development of children from birth to age 8. The focus will be on theories of development as well as developmental milestones.

EC 3322 - Language Arts, Literacy and Creative Arts - Curriculum and Assessment (4)
Focus: study of principles, methods, and materials for teaching young children language and literacy through a play-based integrated curriculum; planning, implementing, and evaluation of developmentally appropriate activities in art, music, movement, and play; the integration, evaluation and documentation of learning in language arts, literacy and creative arts.
Prerequisite(s): EC 3320 (B)

EC 3324 - Science and Mathematics - Curriculum and Assessment (4)
Focuses on a constructivist approach to teaching and learning, mathematics and science concepts and skills in early childhood (birth to age 8). Developing meaningful curricular content, supporting an inquiry approach to learning, planning for diverse learners, project based learning experiences, assessment and integration of Michigan early childhood standards are explored.
Prerequisite(s): EC 3320 (B)

EC 3326 - Supporting Self-Regulation in Young Children (4)
Focus: Development of self regulation in children during the early years. Particular attention is given to both normative and atypical growth in the areas of self control and executive functioning. Various theoretical perspectives will be integrated to develop child guidance principles and techniques applicable in early childhood classrooms.
Prerequisite(s): EC 3322 (B), EC 3324 (B)

EC 3328 - Family, Community School Partnership (4)
This course examines the family, community and school relationship and impact on children's lives. The impact of diverse families on child rearing and education are addressed as well as the

role of the teacher in collaborating with and maintaining relationships with the family and community.
Prerequisite(s): EC 3322 (B), EC 3324 (B)

EC 3330 - Professionalism, Leadership Advocacy (4)
This course will focus on current critical issues in early childhood education. Guidelines and standards will be used to focus on the legal, ethical, and professional dimensions of becoming an early childhood educator. Additionally, the course will attend to the development of leadership, administration, and management skills.
Prerequisite(s): EC 3326 (B), EC 3328 (B)

EC 4960 - Early Childhood Practicum 1 (3)
ECE Practicum experiences are designed to provide students with opportunities to observe and practice in supervised, high-quality early childhood settings. Students are involved in planning curriculum and assessment, observing and recording children's growth and learning, interacting with children, families and colleagues and practicing teaching skills.

EC 4961 - Early Childhood Practicum 2 (3)
See description for EC 4960. As students advance from Practicum 1 to Practicum 2, they will assume greater responsibility for planning and supervision, child evaluation, family conferences and family newsletters.
Prerequisite(s): EC 3326 (B), EC 3328 (B)

FE 3010 - Educational Psychology for K-12 Educators (4)

Development and stage theories of cognition and learning behavior, examined through research accounts of physical and mental variability, cultural background, social circumstances, lived experience, learning style and mode of cultural interactivity. Admission to major. Required field experience. Cross listed with FE 5996.

SE 4401 - Introduction to Students with Special Needs (4)
Introduction to special education, atypical children, individual differences, learner environment and instructional adaptations. Cross listing with SE 5510.

SE 4851 - Foundations of ABA (4)
This course focuses on the principles and concepts of Applied Behavior Analysis (ABA), historical perspective of ABA, fundamental vocabulary, philosophy, and methodology of the science of behavior management. Additional topics include the basics of defining behaviors, data collection, and the use of ABA with various populations. This course is open to undergraduate students interested in obtaining knowledge of Behavior Analysis and certification as a Board

Certified Behavior Analyst (BCBA). Students are expected to read professional literature, participate in discussions, complete literature research, and practice the application of behavioral principles. Completion of assignments and class participation are essential to meeting the course objectives.

SE 4852 - Behavioral Assessment (4)
Course provides an overview of assessment techniques used in behavioral intervention planning. Specific topics include the history and present use of functional assessments, completion of the functional assessment interview, descriptive and functional analysis, data collection and interpretation, preference assessment, and interpretation of evaluation tools for various populations. This course is open to undergraduate students interested in obtaining knowledge of Behavior Analysis and certification as a Board Certified Behavior Analyst (BCBA). Students are expected to read professional literature, participate in discussions, complete literature research, and practice the application of behavioral principles. Completion of assignments and class participation are essential to meeting the course objectives.
Prerequisite(s): SE 4851 (C+)

SE 4853 - Treatment Planning (4)
Techniques used in behavioral intervention planning, data collection, interpretation of assessments, development of goals and objectives, overview and application of treatment interventions, management, supervision, and team planning. Assignments include literature research and paper presentations, participation in discussions, and implementation of behavioral assessment principles. This course is open to undergraduate students interested in obtaining knowledge of Behavior Analysis and certification as a Board Certified Behavior Analyst (BCBA). Students are expected to read professional literature, participate in discussions, complete literature research, and practice the application of behavioral principles. Completion of assignments and class participation are essential to meeting the course objectives.
Prerequisite(s): SE 4851 (C+)

SE 4854 - Research Methods and Ethics (4)
Course includes an overview of the BACB ethical code of conduct, research method techniques, theoretical foundations of empirical research, principles of the scientific method, experimental designs, analyses of research designs, research protocol, and formation of research hypothesis; the majority of these topics will be devoted to methods related to single-case research (i.e., data collection, logic, designs). This course is open to undergraduate students interested in obtaining knowledge of Behavior Analysis and certification as a Board Certified Behavior Analyst (BCBA). Students are expected to read professional literature, participate in discussions, complete literature research, and practice the application of behavioral principles. Completion

of assignments and class participation are essential to meeting the course objectives. Prerequisite(s): SE 4852, SE 4853

SE 4900 - ST: Foundations of Applied Behavior Analysis (4)
Focuses on the principles and concepts of applied behavior analysis (ABA), historical perspective, fundamental vocabulary, philosophy, and methodology of the science of behavior management. Additional topics include the basics of defining behaviors, data collection, and the use of ABA with various populations.

SE 4930 - ABA Clinic Practicum (4)
The application of psychological concepts and methods in a non-academic setting. Includes job placement with a seminar component.

Department of Organizational Leadership

475E Pawley Hall

(248) 370-4109

Fax: (248) 370-4605

Chairperson: *Eileen S. Johnson*

Professors emeriti: *Susan M. Awbrey, William C. Fish, Eric J. Follo, James W. Hughes, Patrick J. Johnson, William G. Keane, Billy J. Minor, M. Sharon P. Muir, Sandra P. Packard, Robert G. Payne*

Professors: *Julia B. Smith, David C. Strubler*

Associate professors: *Cynthia L. Carver, Shannon R. Flumerfelt, Tomas R. Giberson, Eileen S. Johnson, Michael P. Long, Jana Nidiffer, James A. Quinn, Chaunda L. Scott, William L. Solomonson, V. Thandi Sulé, Caryn M. Wells*

Assistant professors: *Trent J. Jourian, C. Suzanne Klein,*

Special instructors: *Christine M. Abbott*

Visiting Assistant Professor: *Robert A. Martin*

The Department of Organizational Leadership of the School of Education and Human Services offers a program leading to the degree of Bachelor of Science in Human Resource Development. This field of study focuses on four areas: organization development, training and development, career/leadership development, and employment systems and standards. The degree program covers topics in these focus areas related to instructional design and delivery, lean leadership, program evaluation, performance appraisal, personnel selection, recruiting, ethics, organization development, principles of leadership, labor relations, employment law, employee involvement and cultural diversity. Graduates are prepared with conceptual knowledge and technical and interpersonal skills for a variety of careers.

Advising

Students should meet with the professional academic adviser for assistance with schedule planning, completing the program plan, interpreting degree requirements, admission to major standing, transfer credits, petitions of exception and graduation audits. The advising office is located in 363 Pawley Hall, (248) 370-4182. Students are encouraged to meet with their adviser at least once per academic year.

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.

Related Minors and Concentrations

Students who wish to obtain a minor offered by SEHS must obtain the approval of the human resource development program adviser. If the minor or concentration is within a school other than SEHS, students must obtain approval from the adviser of the selected minor. Please note that one course cannot be used to satisfy the requirements of three categories under the Department of Organizational Leadership. This means that one course cannot be used to meet the requirements of an HRD major and two HRD minors or to meet the requirements of all three HRD minors.

Departmental Honors

HRD honors are available to students who meet the following standards: a 3.50 or better cumulative average for all courses taken at Oakland University; a 3.70 or better cumulative average in department courses.

Schedule of classes

Specific offerings for each semester may be found in the Schedule of Classes.

Programs

- Applied Leadership Skills Minor
- Employment Systems and Standards Minor
- Human Resource Development Minor
- Human Resource Development, B.S.
- Lean Leadership Minor
- Training and Development Minor

Applied Leadership Skills Minor

Requirements - Minor in applied leadership skills

The School of Education and Human Services (Department of Organizational Leadership) offers the following interdisciplinary minor, which is available to all students at the university. The minor in Applied Leadership Skills is a program of study that 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. The aim of this program of study is twofold. First to allow students to develop an academic understanding of leadership. Then, to assist students in developing leadership capabilities. This program of study may be useful to any student interested in developing skills that will expand the student's leadership capabilities for application within their communities, businesses or other organizations.

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 the coordinator of the minor 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 course in Leadership Principles -- Must complete one of the following

- 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 may want to consider planning 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 coordinator of the minor. (See Director of International Education for opportunities.)

Employment Systems and Standards Minor

Department of Organizational Leadership

Pawley Hall, Room 480B
456 Pioneer Dr.
Rochester, MI 48309-4482

(248) 370-2730

Requirements - Minor in employment systems and standards

Employment Systems and Standards is an interdisciplinary minor that provides an academic background for understanding the practical and theoretical bases of the employee/employer relationship, both where a collective bargaining relationship exists and where it does not. This program may be particularly useful to individuals interested in the operational aspects of employment including the law, collective bargaining, employment regulations, personnel practices, philosophy of employment, and the dynamics of employment-related leadership and participative roles.

This minor is open to any student who has been admitted to the university. Coursework is scheduled to maximize accessibility to both full-time undergraduates and part-time working students. Students who seek to apply credits toward a degree must contact an adviser to design a degree plan and to select appropriate courses.

This minor requires 23 or 24 credits distributed among the areas of preparation listed below. The plan of study is subject to the approval of the coordinator for the minor. 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

- HRD 3330 - Presentation and Facilitation **(4)**
- HRD 4410 - The Study of Labor and Work Organizations **(4)**
- HRD 4510 - Negotiation for Personal Success **(4)**

- HRD 4430 - Collective Bargaining and Dispute Resolution **(4)**
- HRD 4420 - Employee Benefits **(4)**
- HRD 3530 - Cultural Diversity in the Workplace **(4)**
- WGS 3880 - Women in Modern America **(4)**
- HRD 4100 - Strategic Planning **(4)**

Human Resource Development Minor

The School of Education and Human Services offers a minor in human resource development for students other than HRD majors who wish to strengthen their academic majors with coursework in human resource development.

To obtain a minor in HRD, a student must:

1. Complete the minor authorization form with the approval of the HRD minor coordinator.
2. Complete the minor core courses (24 credit hours) with a minimum grade of C+ in each course.

Minor core -- 24 credits

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

Human Resource Development, B.S.

SEHS Advising Office

Pauley Hall, Room 363

456 Pioneer Drive

Rochester, MI 48309-4482

(248) 370-4182

Website

Requirements for the major in human resource development, B.S. program

The curriculum described in this catalog shall be followed by students admitted to pre-HRD status. Admission to pre-HRD status requires a cumulative grade-point average of 2.00 or better. Students admitted to Oakland University pre-HRD status prior to fall 2010 may choose to satisfy either the degree requirements listed in this catalog or those in the catalog of the academic year in which they were initially admitted to Oakland University pre-HRD status (or any catalog during the interim), provided that catalog is not more than six years old at the time of graduation. Students who transfer to the School of Education and Human Services after admission to the university or who are readmitted to the university are required to follow the requirements of the catalog in effect at the time they transfer or are readmitted. 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.

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

1. Complete a minimum total of 124 credits.
2. Complete at least 32 credits in courses at the 3000 level or above at Oakland University.
3. Take the last 8 credits needed to complete the baccalaureate degree requirements at Oakland University.
4. Have a cumulative grade point average of at least 2.00.
5. Satisfy the writing requirement (see Undergraduate degree requirements).
6. Complete the university general education requirement with a minimum total of 40 credits (see Undergraduate degree requirements).
7. Satisfy the university U.S. diversity requirement (HRD 3530 in the HRD major satisfies this requirement).
8. Complete the human resource development core (32 credits), human resource development focus area courses (32 credits), internship or alternative (8 credits), and

general electives (12 credits). Students must obtain a minimum grade of C+ in each HRD required 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 tool 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 3410 - Ethics in Human Resource Development **(4)**
- HRD 3100 - Introduction to Human Resource Development **(4)**
- HRD 3700 - Human Resource Information Systems **(4)**
- HRD 3300 - Instructional Design **(4)**
- HRD 3420 - Work and the Law **(4)**
- HRD 3210 - Group/Team Development and Leadership **(4)**
- HRD 3530 - Cultural Diversity in the Workplace **(4)**
- HRD 3430 - Staffing, Performance Evaluation and Interaction within Organizations **(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: Organization 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.

Organization Development

- * HRD 4200 - Change Process and Organizational Analysis **(4)**
- HRD 3600 - Lean Principles and Practices in Organizations **(4)**

- HRD 3230 - Fundamentals of Human Interaction **(4)**
- HRD 4600 - Lean Kaizen in Organizations **(4)**
- HRD 4100 - Strategic Planning **(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 at the 0500 level or higher, and may be from HRD or any other field of interest.

D. Human Resource Development Internship -- 8 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, eight 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.

Research internship

A research internship of eight 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 form available at the HRD internship office, 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 for approval or disapproval by a committee of the Department of Organizational Leadership.

Project internship

A project internship of eight 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 for approval or disapproval by a committee of the Department of Organizational Leadership.

Lean Leadership Minor

Lean Leadership is a specialized minor that is intended for students who want to enhance their career opportunities and add value to their employers through lean knowledge, practice, and leadership in the workplace. Students may use the minor to receive a Lean Green Belt. All students interested in pursuing the minor must meet with the HRD advisor in the School of Education and Human Services in Pawley Hall.

Requirements for minor in lean leadership

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

Training and Development Minor

Requirements - Minor in training and development

The minor in Training and Development is a specialized minor that is intended for students who are interested in training and development functions in the workforce. Students are provided 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 individuals majoring in human resources, management, nursing,

wellness and health promotion and education, as well as those with a general interest in designing, developing and delivering training and other presentations in their respective fields.

The minor is open to any student who has been admitted to the university. Courses are scheduled to maximize accessibility to both full-time undergraduates and working adult students. Students who seek to apply credits toward a degree must contact an adviser to design a degree plan and to select appropriate courses.

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.

The courses for the minor in training and development are as follows:

- HRD 3100 - Introduction to Human Resource Development **(4)**
- HRD 3330 - Presentation and Facilitation **(4)**
- HRD 3300 - Instructional Design **(4)**
- HRD 4320 - Program Evaluation **(4)**
- HRD 4300 - Instructional Methods **(4)**
- HRD 4700 - E-learning in Organizations **(4)**

Courses

HRD 3100 - Introduction to Human Resource Development (4)
Introduces strategic assumptions affecting individual and organizational development priorities. Investigates roles and competencies for HRD practitioners in a variety of workplace settings. Develops an understanding of HRD principles and practices and how they benefit the individual and organization.

HRD 3210 - Group/Team Development and Leadership (4)
Studies the use of small group and team-based structures to enhance quality and performance in the workplace. Topics include team development, leadership, group norms and goals, resolving group conflicts, group problem solving and decision making models, and group assessments.
Prerequisite(s): WRT 1060 or equivalent.

HRD 3230 - Fundamentals of Human Interaction (4)

Introduces key aspects of interpersonal relationships, such as self disclosure, feedback, conflict, trust and nonverbal communication. Examines various theories of healthy relationships and personal maturity. Self-appraisal, role plays, simulations and group interaction are used. *Satisfies the university general education requirement in the knowledge applications integration area. Prerequisite for knowledge application integration: completion of the general education requirement for a writing intensive course in general education or in the social science knowledge exploration area.*

HRD 3300 - Instructional Design (4)
Introduces the application of systematic instructional design principles to the design of instruction. Critically examines the components of an instructional design model and applies its principles to the design of instruction.
Prerequisite(s): WRT 1060 or equivalent.

HRD 3330 - Presentation and Facilitation (4)
Provides the knowledge and skills to facilitate and deliver professional presentations in various HRD and training settings. Focuses on the communications process, the analysis of the audience, the research and preparation of content, the selection of appropriate support materials, and the delivery or facilitation of professional presentations and meetings. *Satisfies the university general education requirement in the knowledge applications integration area.*
Prerequisite(s): completion of the general education requirement for a writing intensive course in general education or the social science knowledge exploration area.

HRD 3410 - Ethics in Human Resource Development (4)
Introduces the forces that shape ethical behavior in the workplace; ethical considerations in transactions with employees, supervisors and peers; ethical responsibility in the marketplace and society; and how to solve ethical problems.
Prerequisite(s): HRD 3100 (C+), WRT 1060 or equivalent.

HRD 3420 - Work and the Law (4)
A guide to the basic common law rights and responsibilities directly related to employment, as well as policies and procedures under the National Labor Relations Act. Includes a study of the principles used in employment related alternative dispute systems.

HRD 3430 - Staffing, Performance Evaluation and Interaction within Organizations (4)
Examines the strategic placement of HRD within an organization as well as the theories and practices of professional human resource development in the areas of staffing, setting performance standards and evaluating performance.

HRD 3440 - Introduction to Labor and Employment Relations (4)
Studies principles of both private and public sector labor relations. Includes discussions of the rights and responsibilities of all parties and traces labor relations through its origins and basic principles to current volatile issues and developing trends.

HRD 3445 - Introduction to Public Sector Labor and Employment Relations (4)
Studies principles of public sector labor relations. Concentrates on public employment relations in Michigan, and includes discussions of the rights and responsibilities of all parties and traces labor relations through its origins and basic principles to current volatile issues and developing trends.

HRD 3510 - Principles of Leadership (4)
This course focuses on the major leadership theories and their application in a wide variety of settings. Includes opportunities for students to evaluate and enhance their own leadership potential.

HRD 3520 - Career Development (4)
Studies of career development theory, practices and resources in the workplace. Topics include development and implementation of career development programs, career materials and resources, trends and placement activities in working with individuals and organizations. Prerequisite(s): WRT 1060 or equivalent.

HRD 3530 - Cultural Diversity in the Workplace (4)
Identifies relevant culture-specific issues related to race, gender, ethnicity, socioeconomic status, sexual orientation, disabilities and religion. Examines historical context of culture-specific issues (knowledge). Facilitates awareness of values and their significance in helping relationships (self awareness). Presents an ecological framework for developing effective practices (skills). *Satisfies the university general education requirement in U.S. diversity.* Prerequisite(s): WRT 1060

HRD 3600 - Lean Principles and Practices in Organizations (4)
This course focuses on the application of systems theory as it relates to lean implementation on the human component in an organization. *Satisfies the university general education requirement in the knowledge applications integration area. Prerequisite for knowledge applications: completion of the general education requirement for a writing intensive course in general education or the social science knowledge exploration area.*

HRD 3700 - Human Resource Information Systems (4)

Examines trends in technology that are transforming HRD practices, including HRIS, portals, knowledge management, service centers, and distance learning. Explores building a technology plan and using technology strategically within the organization.
Prerequisite(s): HRD 3100 (C+)

HRD 4100 - Strategic Planning (4)
Development of long-range plans to accomplish the training and development mission. Simulation, group problem solving and preferred future planning used to acquire strategic planning skills.
Prerequisite(s): senior standing.

HRD 4200 - Change Process and Organizational Analysis (4)
Study of structure of HRD services in organizations and the processes of effecting individual and group change. Influence of assigned roles of administrators and workers on attitude and behavior. Theory and research of institutional growth and change.
Prerequisite(s): HRD 3100 (C+)

HRD 4300 - Instructional Methods (4)
Provides knowledge and skills in the development of instructional materials for adults. Explores the application of theories of message design, communication, and learning to the development of instruction.
Prerequisite(s): HRD 3300 (C+)

HRD 4320 - Program Evaluation (4)
Provides knowledge and skills to design and conduct program evaluations. Develops skills in basic data collection, data analysis, and reporting of results.

HRD 4410 - The Study of Labor and Work Organizations (4)
An in-depth study of employment systems and relationships, and employee organizations.

HRD 4420 - Employee Benefits (4)
Introduction to employee benefits includes planning and administration of programs in changing employment and social contexts. Includes legally required and discretionary offerings such as Social Security, Workers' and Unemployment Compensation, health, disability and life insurance, retirement, pay for time not worked, leaves, flextime, and others as well as benefit costing.

HRD 4430 - Collective Bargaining and Dispute Resolution (4)

In-depth study of the principles and practices of private and public sectors collective bargaining and dispute resolution including strategic planning and preparation, position formulation, negotiation techniques, and agreement/ratification processes. Exploration of employment dispute resolution through observation of formal arbitration presentations, decision-making exercises, and active participation in formal arbitration presentations.

HRD 4440 - Civil Rights and Regulations in Employment (4)
Study of the principles, regulations, policies and procedures of federal and state Civil Rights laws. Additional study includes Age Discrimination in Employment Act, Americans with Disabilities Act, Family Medical Leave Act, Pregnancy Discrimination Act, and related principles of civil rights and employment regulations.

HRD 4510 - Negotiation for Personal Success (4)
This course integrates the intellectual analysis of negotiation theory with the development of negotiation skills. The course focuses on two core approaches to negotiation, the psychological sub-processes of negotiation and the strategies that can be used by the parties to resolve breakdowns in the negotiation process. *Satisfies the university general education requirement in the knowledge application integration area. Prerequisite for knowledge application: completion of the general education requirement in the social science knowledge exploration area.*

HRD 4600 - Lean Kaizen in Organizations (4)
This course provides students with a comprehensive "learn-do" experience about how successful Lean Kaizens are conducted. The six focus areas are: Lean Philosophy, Lean Tools Techniques, Teambuilding, Kaizen Methodology, Organization Change and Presentation Facilitation. Students will participate on a kaizen team and work on a dysfunctional real-world process. *Satisfies the university general education requirement in the knowledge applications integration area. Prerequisite for knowledge applications integration: completion of the general education requirement in the social science knowledge exploration area.*

HRD 4610 - Lean Green Belt Certificate (2)
This course is taken in conjunction with the HRD 3600, HRD 4600 or POM 4900. Students who achieve a (B) or greater GPA in one of these courses and successfully complete the required field experiences, case analyses and assessments will earn a Lean Green Belt Certificate of Completion.

HRD 4700 - E-learning in Organizations (4)
Examines concepts, strategies and applications of multimedia and web-based instruction. Explores the design and development of computer-based instruction, popular authoring tools,

roles of instructors and learners, and characteristics of effective instructional materials.
Prerequisite(s): HRD 3300 (C+), HRD 4300 (C+)

HRD 4900 - Workshop: Career Development (4)
Opportunity for industry/agency personnel and students to focus on various programs and practices for career development. This is a special topics course. It allows the course to fit the need of professional development.

HRD 4950 - Internship in HRD (8)
A culminating experience where students apply learning in a supervised HRD setting. Students must submit applications to the internship coordinator by designated dates on the internship application approximately three months prior to the semester in which the internship will be served. May be repeated only with department permission. *Satisfies the university general education requirement for the capstone experience. Satisfies the university general education requirement for a writing intensive course in the major. Prerequisite for writing intensive: completion of the university writing foundation requirement.*
Prerequisite(s): full admission to major standing; completion of 100 credits (minimum); an overall GPA of (C) or better; completion of the following courses with a minimum grade of (C+) in each (core) HRD 3410, HRD 3100, HRD 3700, HRD 3300, HRD 3420, HRD 3210, HRD 3530, and HRD 3430, (focus area) HRD 3440, HRD 3520, HRD 4200 and HRD 4300; permission of internship coordinator by application to department.

HRD 4970 - Seminar in HRD (4)
Scope is predefined and based on a broad topic in the HRD field. Students select research areas and contribute their findings to the class. Visiting consultants and the instructor provide direction and content. May be taken more than once for a total of eight credits.
Prerequisite(s): course work or experience in the seminar topic

HRD 4996 - Independent Study in HRD (2 OR 4)
Directed reading or research in an HRD topic. May be elected for independent study. Student selects topic, obtains faculty sponsor's permission before registration and writes report. May be taken, with special permission, more than once for eight credits total.
Prerequisite(s): permission of a faculty sponsor by application to department

Department of Reading and Language Arts

490A Pawley Hall

(248) 370-3054

Fax: (248) 370-4367

Chairperson: *Linda M. Pavonetti*

Professors emeriti: *Richard F. Barron, Jane Bingham, Gloria T. Blatt, Harald C. Cafone, Robert J. Christina, James F. Cipielewski, George E. Coon, Ronald L. Cramer, W. Dorsey Hammond, Harry T. Hahn, Anne Porter, Robert M. Schwartz, Toni S. Walters*

Professors: *Mary K. Lose, John E. McEneaney, Gwendolyn M. McMillon, Linda M. Pavonetti*

Associate professors: *Tanya M. Christ, S. Rebecca Leigh, Ledong Li*

Assistant professors: *Kristin McIlhagga, Jason Moore, Paul Morsink*

As a department within the School of Education and Human Services, the instructional staff of the Reading and Language Arts Department offers courses in reading, language arts, digital literacies and learning and children's literature at the undergraduate level for students pursuing a career in teaching. For detailed information and the requirements of an Elementary Education Bachelor of Science degree with a major (36 credits) or minor (24 credits) in Language Arts, please go to the on-line academic catalog.

The department offers a master's degree program in reading and language arts, certificate programs in digital literacies and learning, post-master's certificate programs, K-12 reading specialist endorsements, and a doctor of philosophy degree in reading education.

Courses

DLL 4196 - Digital Technologies in the Elementary Classroom (4)
Students will develop understanding and skills in the integration of digital technologies to support teaching and learning at the elementary level.
Prerequisite(s): Major standing.

DLL 4197 - Digital Technologies in the Secondary Classroom (4)
Students will develop understanding and skills in the integration of digital technologies to support teaching and learning at the secondary level.

DLL 4399 - Secondary Education- Uses of Computers and Related Technologies (4)
A general computer literacy course designed with focus on educational applications to enable secondary education students to utilize computers and related technologies for career and

personal goals. This course is a requirement of secondary education majors for the computer science minor.
Prerequisite(s): 12 credits in Computer Science.

DLL 4464 - Applying Digital Technologies to Issues of Practice (4)
Students learn how to facilitate application of digital technologies to issues of practices from organizational development and change perspective.
Prerequisite(s): DLL 4196 or DLL 4197

DLL 4996 - Independent Study in Digital Literacies and Learning (2 OR 4)
Students pursue a digital literacies topic of interest to independently study under instructor guidance. A written proposal is prepared and must be approved by faculty sponsor
Prerequisite(s): DLL 4196 or DLL 4197

DLL 4998 - Final Project in Digital Literacies and Learning (4)
Students formulate a project in an area of digital literacies interest to study independently under instructor guidance. A written proposal is prepared and must be approved by faculty sponsor.
Prerequisite(s): DLL 4196 or DLL 4197

RDG 3132 - Literature for Children (4)
Focuses on the critical evaluation of children's literature, understanding its history, assessing children's needs and developmental levels, and selecting and using quality literature with children.
Prerequisite(s): WRT 1060 or equivalent.

RDG 3134 - Teaching Writing in the Elementary and Secondary School (4)
Basic course in teaching the writing process. Students participate in writing workshops, discuss instructional issues and methods, and experience writing through personal engagement in the writing process.
Prerequisite(s): WRT 1060

RDG 3231 - Teaching of Reading (4)
Basic course in the teaching of reading in the elementary and middle grades. Content includes strategies for teaching comprehension, phonics, emerging literacy, methods of reading instruction, and other pertinent issues. Includes a required field experience.
Prerequisite(s): EED 3000 (B)
Corequisite(s): RDG 3233

RDG 3233 - Teaching the Language Arts (4)
Preparation for teaching language arts in elementary arts in elementary and middle grades. Content includes oral language development, listening, writing, spelling and the reading-writing connection. Includes a required field experience.
Prerequisite(s): EED 3000 (B)
Corequisite(s): RDG 3231

RDG 4214 - Reading Appraisal in the Elementary Classroom (4)
Focuses on the assessment of reading. Uses formal and informal assessment instruments. Students learn to use assessment data to develop instructional programs. Specifically involves reading instruction with pupils and involvement with school personnel. Includes a required field experience.
Prerequisite(s): RDG 3231 (B), RDG 3233 (B)

RDG 4238 - Teaching Reading in the Content Areas (4)
Designed for content subject learning in the secondary classroom. Focuses on the reading process, strategies and materials for teaching reading in English, social studies and other subjects. Includes a required field experience.
Prerequisite(s): admission to secondary education program or permission of instructor.

RDG 4996 - Independent Study and Research (2 OR 4)
Directed individual reading research. May be repeated for a maximum of four credits. Departmental permission required. Students must obtain written faculty agreement to supervise their study before permission is granted.
Prerequisite(s): RDG 3231, RDG 3233

Department of Teacher Development and Educational Studies

485B Pawley Hall

(248) 370-2613

Fax: (248) 370-2639

Chairperson: *Cynthia Carver*

Elementary Program Coordinator: *Cynthia Carver*

Secondary Program Coordinator: *Anthony Tuf Francis*

Professors emeriti: *James W. Hughes, M. Sharon P. Muir, Dyanne Tracy, Dawn Pickard*

Professors: *Ji-Eun Lee, Jon Margerum-Leys, Mary T. Stein, [TEJ1]*

Associate professors: *Michael MacDonald, Mark Olson, Richard Pipan*

Assistant professors: *Anica Bowe, Anthony Tuf Francis, Danielle Ligocki, Paul Weinberg*

Visiting assistant professor: *Terri Jongekrijg*

Special instructor: *Linda Tyson*

Visiting Special Instructor: *Elizabeth Crowder*

General Information

The Department of Teacher Development and Educational Studies offers programs designed to prepare students for careers in elementary and secondary school teaching. Both programs are approved by the Council for the Accreditation of Education Preparation (CAEP) and the Michigan Department of Education.

In conjunction with the Departments of Human Development and Child Studies and Reading and Language Arts, the Department of Teacher Development and Educational Studies offers programs enabling students to concurrently earn a Bachelor of Science degree from Oakland University and recommendation for a Michigan elementary standard certificate **(see*: Michigan Teacher Certification*)**.

The Department offers a fifth-year program, the Secondary Teacher Education or STEP program, that prepares students majoring in selected academic fields in the College of Arts and Sciences for recommendation for a Michigan secondary standard certificate. Students interested in secondary education programs should consult the College of Arts and Sciences section of the catalog.

Students who already hold a four-year degree from an accredited college or university will need to complete the Bachelor degree requirements, excluding the general education requirements, or can consider the Master of Arts in Teaching program (elementary or secondary).

Admission to the Major

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 major are:

1. Meeting the basic skills requirement for the State of Michigan, which can be met using minimum SAT scores of 480 in Evidence-Based Reading and Writing and 530 in Mathematics. Please note: students must request that SAT scores be sent to OU.
2. Completion of 12 credits of General Education Requirements coursework with a minimum grade of a C or 2.0 in each course.
3. A minimum of 60 documented clock-hours experience working with children in noncustodial activities. Field experience in EED 2000/ EED 2001 meets30 hours of this requirement. Examples of activities and documentation forms are available on the advising website.
4. Minimum grade of B or 3.0 in EED 2000/ EED 2001. (New transfer students who have taken an approved "Introduction to Education" course at their previous institution as well as first-year undergraduates who have participated in an approved teacher cadet program and students completing EED 1000 may be approved to take EED 2001 in lieu of EED 2000.)
5. A cumulative grade-point average (GPA) of at least 2.80.
6. Submission of a completed major standing application to the SEHS Advising Office.

Advising

The SEHS Advising Office is located in 363 Pawley Hall, (248) 370-4182. Students are encouraged to meet with an academic adviser at least once per academic year. Academic advisers assist with schedule planning, interpreting degree requirements, admission to major standing, transfer credits, state testing requirements, certification information and graduation audits.

Professional Program

Upon being admitted to the elementary education program, students are expected to maintain continuous enrollment during the fall and winter semesters in at least one (1) and no more than four (4) professional education courses. Students must follow the required sequence of courses provided at the time of admission to major. Prerequisites are required for some professional education courses. See course offerings for prerequisites and corequisites. All General Education and Professional Education courses must be completed prior to student teaching.

Retention in the SEHS Professional Education Programs

Retention in the SEHS professional education programs is based on the expectation that students will demonstrate the characteristics of and conduct themselves as members of the profession as described in the program materials. Students may be removed from a program, removed from a field placement, or may not be recommended for certification for: (i) failure to fulfill any such expectations to Oakland University's satisfaction, including, without limitation,

the expectation that they demonstrate adequate and appropriate communication ability and character, and develop, maintain and fulfill their professional relationships, responsibilities and competencies: (ii) academic misconduct; (iii) violations of the Michigan Code of Ethics for Teachers; (iv) failure to fulfill any Oakland University academic or conduct requirements; or (v) violations of any other program or Oakland University's policies, rules, regulations or ordinances.

Students may also be removed from field placements: (i) upon request of a building administrator; (ii) for a failure to comply with the requirements of this Competency and Retention Statement; (iii) if Oakland University determines that removal is in the best interests of the student, Oakland University, the professional education programs, or the schools where the student is placed; (iv) inadequate planning, classroom management, and/or discipline; (v) lack of content knowledge; (vi) deficiency in oral or written communication skills; (vii) inappropriate personal or professional behavior; (viii) ethical impropriety; (ix) violation(s) of community standards or policies; or (x) failure to exercise appropriate, professional judgments.

Field placements: In addition to the student teaching internship, participation is required in 4 field placements, each anchored to a specific course (EED 2000 /EED 2001, EED 3001, RDG 3231, EED 4270) The Office of School and Field Services arranges placements, including placement in culturally and economically diverse school districts. Depending on school district requirements, students may be required to be fingerprinted and have a state police and FBI background check, at their expense, before beginning a field placement.

Internship: EED 4950 must be taken in the final semester of the degree program.

Application for the internship, EED 4950, must be made one full academic year in advance of the intended enrollment. Students must check the School and Field Services website for the date of the required seminar meeting (held in the fall semester for both fall and winter student teacher applicants) at the time that application is made. Admission criteria for the internship are: a) satisfactory grade-point average and minimum required grades; b) completion of all professional education coursework and field placements; c) completion of all required coursework for the teaching major and/or minors; and d) students placed in K-5 classrooms must have passed the MTTC (Michigan Test for Teacher Certification) Elementary Education test (103); students placed in a middle school must have passed the MTTC Elementary Education test (103) and the MTTC Endorsement tests for their major and/or minors prior to beginning the internship semester. Students will be required to be fingerprinted and have a state police and FBI background check at their own expense. EED 4950 may not be repeated.

Students must obtain approval from the Petition of Exception Committee to enroll in more than 12 credits during the internship semester. A minimum grade of C or 2.0 in EED 4950 is required for graduation and a minimum grade of B or 3.0 for recommendation for certification. Students who do not earn the minimum grade for certification can earn a B.S. without certification with an approved petition of exception.

Michigan Teacher Certification

To be recommended for a standard elementary certificate, elementary education majors must successfully complete requirements for the Elementary Education, B.S., earn a minimum grade of a B or 3.0 in EED 4950, and successfully pass the elementary education MTTC #103 exam, The State also requires a certificate in first aid and adult/child CPR before certification may be recommended. Successful completion of our program and internship does not guarantee certification by the State of Michigan.

Applicants should be aware that a conviction for a felony or misdemeanor may constitute grounds for denial of a certificate by the State of Michigan. (See complete policy on the School and Field Services website.)

Teaching Certification for Elementary Education: The Michigan elementary standard certificate is valid for teaching all subjects in grades K-5, all subjects in self-contained classrooms for grades 6-8 in which one teacher provides a majority of the instruction, and in teaching majors and minors in departmentalized programs for grades 6-8.

Students who complete the ESL endorsement earn K-12 certification in this content area.

Schedule of classes

Specific offerings for each semester may be found in the Schedule of Classes.

Course descriptions

For FE and SE course descriptions, see the Department of Human Development and Child Studies; for RDG and IST courses, see the Department of Reading and Language Arts. The department offers courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in SAIL. All professional courses may be retaken only once.

Programs

- Elementary Education, B.S.
- Secondary Education (OU STEP)

Elementary Education, B.S.

SEHS ADVISING OFFICE

Pawley Hall, Room 363
456 Pioneer Drive
Rochester, MI 48309-4482

(248) 370-4182

SEHS Advising

Students who wish to pursue an elementary education major are admitted by the Admissions Office and given 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, Pawley Hall (Room 363), 456 Pioneer Drive.

Pre-elementary education students may only register for the following categories of coursework: Math (MTH 0661, MTH 0662, MTE 2110 , MTE 2111) Writing (WRT 1020, WRT 1050, WRT 1060), General Education, Major/Minor endorsement area courses, EED 2000/EED 2001, SCS 2060 and the 20-credit planned program.

Requirements for the Bachelor of Science degree with a major in elementary education

Program requirements

Admission to major standing is required before beginning the professional sequence. 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.

To earn the BS degree - students must:

1. Complete 132-159 credits, depending on the student's core content major or minor areas of concentration. At least 32 credits, including the last eight, must be taken at Oakland University and at least 32 credits must be at the 3000 level or above. Education credits may not be older than six years upon completion of the program.
2. Meet university General Education Requirements.
3. Complete one teaching major or two teaching minors (from the core content areas described below) with a minimum grade of B- or 2.7 in each course.

4. Complete a 20-credit planned program consisting of EED 3220, EED 4180, EED 4181, MTD 3001, and three additional core content area courses that are not in the student's one teaching major or two minors.

5. Complete pre-professional and professional coursework with a minimum grade B or 3.0 in each course, unless otherwise noted, and a minimum grade of C or 2.0 in EED 4950 (B or 3.0 required for recommendation for teaching certification). Pre-professional courses: MTE 2110 C or 2.0, MTE 2111 C or 2.0, EED 2000/EED 2001 B or 3.0, SCS 2060. Professional courses: EED 3000, EED 3001, FE 3010 , EED 3220, DLL 4196, MTD 3001, SE 4401, RDG 3231, RDG 3233, EED 4230, EED 4260, EED 4180, EED 4181, EED 4270, and RDG 4214 . Students with a major or minor in a modern language must also take EED 4240.

6. Earn a minimum grade of C or 2.0 in each general education course and maintain a cumulative GPA of 2.80 or better.

7. Be in compliance with all legal curricular requirements for Michigan certification.

General education

Some General Education Requirements courses fulfill major/minor and 20-credit planned program requirements. Students should consult their adviser before selecting courses.

Core content area majors/minors

In keeping with state requirements, one teaching major selected from the following are required for certification. A teaching major/minor identifies subjects that a graduate is certified to teach in grades 6-8. Coursework is limited to the classes listed and those on the approved list available in the advising office. Students must earn a minimum grade of B- (or 2.7) in each teaching major/minor course. Courses transferred from institutions that assign letter grades must have a minimum grade of B- to be accepted. Course exemption granted based on Advanced Placement credit may substitute for major/minor coursework when applicable. This list may change to reflect changes in state-approved major and minor programs. Transfer courses may be reviewed by advisers to determine if content meets the endorsement standards.

Language arts teaching minor -- 24 credits

ENG (choose one (1) course from the list of approved Literature General Education courses):

- RDG 3132 - Literature for Children **(4)**

- ALS 1101 - The Humanity of Language **(4)**
- RDG 3231 - Teaching of Reading **(4)**
- RDG 3233 - Teaching the Language Arts **(4)**
- RDG 4214 - Reading Appraisal in the Elementary Classroom **(4)**
- Students in the Honors College may use HC 2020 in place of the ENG requirement.

Language arts teaching major -- 36 credits

Meet requirements of the language arts minor plus 12 additional credits selected with at least one course from the Writing Component:

- RDG 3134 - Teaching Writing in the Elementary and Secondary School **(4)**
- ENG 2110 - Fundamentals of Grammar **(4)**
- ENG 3110 - Advanced Critical Writing **(4)**
- CW 3200 - Workshop in Fiction **(4)**
- WRT 3086 - Workshop in Creative Non-Fiction **(4)**
- JRN 2000 - Introduction to Journalism and News Writing **(4)**
- JRN 3120 - Feature Writing **(4)**
- WRT 3062 - Writing Center Studies and Tutoring Practice **(4)**
- WRT 3060 - Global Rhetorics **(4)**
- WRT 3064 - Writing About Culture: Ethnography **(4)**

One course from the Oral Language Component:

- COM 2000 - Public Speaking **(4)**
- COM 2403 - Group Dynamics and Communication **(4)**
- COM 3000 - Relational Communication Theory **(4)**
- COM 3400 - Relational Communication **(4)**

- COM 2702 - Performance Communication **(4)**
- COM 3406 - Listening in Communication **(2)**
- THA 1000 - Introduction to Theatre **(4)**
- THA 1004 - Acting for Non-Theatre Majors **(2)**
- THA 3030 - Stage Management **(2)**

And one course from a combination of the two or one of the following:

- ALS 4334 - Language Development in Children **(4)**
- ALS 4335 - Psycholinguistics **(4)**
- ALS 4374 - Cross-Cultural Communication **(4)**
- ALS 4375 - Language and Culture **(4)**
- ALS 4376 - Language and Society **(4)**
- DLL 4464 - Applying Digital Technologies to Issues of Practice **(4)**
- LIN 2201 - Introduction to Linguistics **(4)**
- RDG 4996 - Independent Study and Research **(2 OR 4)**

Mathematics teaching minor -- 20 credits

- MTE 2110 - Mathematics for Elementary Education I **(4)**
- MTE 2111 - Mathematics for Elementary Education II **(4)**
- MTE 3118 - Advanced Topics in Mathematics for Elementary Education **(4)**
- MTE 4110 - Elementary School Mathematics and the Computer **(4)**
- STA 2220 - Introduction to Statistical Concepts and Reasoning **(4)**

Mathematics teaching major -- 30 credits

Meet requirements of the mathematics minor plus at least 10 credits from:

- MTH 1118 - Mathematical Sciences in the Modern World **(4)**

- MTH 1222 - Calculus for the Social Sciences **(4)**
- MTH 1441 - Precalculus **(4)**
- MTH 1554 - Calculus I **(4)**
- CSI 1300 - Introduction to Computer Programming **(4)**
- MTE 4905 - Special Topics **(2 OR 4)**

Modern languages teaching minor -- 20 to 24 credits - All credits must be at the 3000-4000 level.

In addition, EED 4240 - Foreign Language Teaching Methods in Elementary and Middle School, is required.

In Chinese

- CHE 3140 - Advanced Chinese Grammar **(4)**
- CHE 3160 - Chinese Conversation **(2)**
- CHE 3180 - Chinese Composition **(2)**
- CHE 3510 - Chinese Civilization **(4)**
- CHE 3550 - Translation: Chinese **(4)**
- CHE 4080 - Advanced Chinese Conversation and Reading **(4)**

In French

- FRH 3140 - French Grammar Review **(4)**
- FRH 3160 - French Conversation **(2)**
- FRH 3180 - French Composition **(2)**
- FRH 3510 - French Civilization **(4)**
- FRH 3700 - Introduction to French Literature **(4)**
- plus 4 credits elective at the 3000-4000 level

In German

- GRM 3140 - Adv GRM Grammar/Texts/Contexts **(4)**
- GRM 3160 - German Conversation **(2)**
- GRM 3180 - German Composition **(2)**
- GRM 3710 - Introduction to the Study of German Literature **(4)**
- GRM 4400 - German Culture II **(4)**
- plus 4 credits elective at the 3000-4000 level

In Japanese

- JPN 3140 - Advanced Japanese Grammar **(4)**
- JPN 3180 - Japanese Composition **(4)**
- JPN 3510 - Japanese Civilization **(4)**
- JPN 3700 - Introduction to Japanese Literature **(4)**
- plus 4 credits elective at the 3000-4000 level

In Spanish

- SPN 3140 - Spanish Grammar Review **(4)**
- SPN 3170 - Intermediate Spanish Conversation and Composition **(4)**
- SPN 3510 - Spanish Civilization **(4)**
- SPN 3800 - Introduction to Spanish-American Literature **(4)**
- SPN 4080 - Advanced Spanish Conversation and Composition **(4)**
- plus 4 credits elective at the 3000-4000 level

Note:

At least 12 credits of those required for the elementary teaching minor in a modern language must be taken at Oakland University.

Modern languages teaching major -- 32 credits - All credits must be at the 3000-4000 level

In addition EED 4240 - Foreign Language Teaching Methods in Elementary and Middle School is required.

In French

- FRH 3140 - French Grammar Review **(4)**
- FRH 3160 - French Conversation **(2)**
- FRH 3180 - French Composition **(2)**
- FRH 3510 - French Civilization **(4)**
- FRH 3700 - Introduction to French Literature **(4)**
- FRH 3800 - Survey of French Literature **(4)**
- plus 12 credits elective at the 3000-4000 level

In German

- GRM 3140 - Adv GRM Grammar/Texts/Contexts **(4)**
- GRM 3160 - German Conversation **(2)**
- GRM 3180 - German Composition **(2)**
- GRM 3710 - Introduction to the Study of German Literature **(4)**
- GRM 3810 - Great Works in German Literature **(4)**
- GRM 4400 - German Culture II **(4)**
- plus 12 credits elective at the 3000-4000 level

In Japanese

- JPN 3140 - Advanced Japanese Grammar **(4)**
- JPN 3160 - Japanese Conversation **(4)**
- JPN 3180 - Japanese Composition **(4)**
- JPN 3510 - Japanese Civilization **(4)**
- JPN 3700 - Introduction to Japanese Literature **(4)**

- JPN 4080 - Advanced Japanese Conversation and Reading **(4)**
- IS 2200 - Perspectives on Japan **(4)**
- plus 4 credits elective at the 3000-4000 level

In Spanish

- SPN 3140 - Spanish Grammar Review **(4)**
- SPN 3170 - Intermediate Spanish Conversation and Composition **(4)**
- SPN 3500 - Latin American Civilization **(4)**
- SPN 3510 - Spanish Civilization **(4)**
- SPN 3700 - Introduction to Spanish Literature **(4)**
- SPN 3800 - Introduction to Spanish-American Literature **(4)**
- SPN 4080 - Advanced Spanish Conversation and Composition **(4)**
- plus 4 credits elective at the 3000-4000 level

Integrated science teaching minor -- 28 credits

- SCS 2060 - Science for the Elementary Teacher **(4)**
- SCI 1000 - Physical Sciences in Life, the World and Beyond **(4)**
- BIO 1002 - Human Biology **(4)** (or BIO 1006 or BIO 2100 and 2600)
- BIO 3000 - Biology and Society **(4)** (or BIO 1200 or BIO 1300)
- CHM 1040 - Introduction to Chemical Principles **(4)** (or CHM 1440 and CHM 1450)
- PHY 1040 - Astronomy: The Solar System **(4)**
- PHY 1060 - Earth Science/Physical Geography **(4)**
- PHY 1080 - Principles of Physics I **(4)** (or PHY 1010 /PHY 1100, or PHY 1610, or PHY 1510/PHY 1100)

Integrated science teaching major -- 36 credits

Meet requirements of the integrated science minor plus four credits from:

- PHY 1040 - Astronomy: The Solar System **(4)** or
- PHY 1060 - Earth Science/Physical Geography **(4)**

And four credits of electives selected from:

- BIO 1200 - Biology I **(4)**
- CHM 3000 - Chemistry, Society Health **(4)** (or CHM 167)
- SCS 4360 - Environmental/Outdoor Education for Elementary/Middle School Levels **(4)**
- PHY 1090 - Principles of Physics II **(4)** (or PHY 1020 /PHY 1110, or PHY 1620, or PHY 1510/PHY 1110)
- PHY 1200 - The Physics of Everyday Life **(4)**

Social studies teaching major -- 36 credits

- HST 1100 - Introduction to American History Before 1877 **(4)**
- HST 1200 - Introduction to American History Since 1877 **(4)** or HST 2010 World History **(4)**
- ECN 2000 - Principles of Macroeconomics **(4)**
- ECN 2010 - Principles of Microeconomics **(4)**
- GEO 2000 - Global Human Systems **(4)**
- GEO 1060 - Earth Science/Physical Geography **(4)**
- PS 1100 - Introduction to American Politics **(4)**
- SST 3070 Social Studies for Elementary and Middle School Teachers

Plus one additional PS course selected from:

- PS 1400 - Comparative Politics **(4)**
- PS 1600 - Issues in World Politics **(4)**
- PS 3040 - International Politics: Theory and Practice **(4)**
- PS 3420 - European Political Systems **(4)**

If additional elective credits are needed, they should be selected from either the list of approved courses detailed above or:

- HST 1400 - Introduction to European History Since 1715 **(4)** (or HST 1300) or
- HST 3210 - History of American Foreign Relations in the Twentieth Century **(4)**
- SST 4996 - Independent Study in Social Studies Education **(1 TO 4)**

Early Childhood Education - 30 credits

B (or 3.0) minimum grade in each course

- EC 3320 - Child Development - Birth to Age 8 **(4)**
- EC 3322 - Language Arts, Literacy and Creative Arts - Curriculum and Assessment **(4)**
- EC 3324 - Science and Mathematics - Curriculum and Assessment **(4)**
- EC 3326 - Supporting Self-Regulation in Young Children **(4)**
- EC 3328 - Family, Community School Partnership **(4)**
- EC 3330 - Professionalism, Leadership Advocacy **(4)**
- EC 4960 - Early Childhood Practicum 1 **(3)**
- EC 4961 - Early Childhood Practicum 2 **(3)**

In addition to their one core area major, or two minor, students may add an additional endorsement in:

English as a Second Language - 20 credits

- LIN 2201 - Introduction to Linguistics **(4)**
- ALS 4317 - Models of Second Language Acquisition **(4)**
- ALS 4375 - Language and Culture **(4)**
- ALS 4418 - Teaching English as a Second Language **(4)**
- ALS 4438 - Theory/Practice in Language Testing **(4)**

- ALS 4960 - Practicum **(4)**

Secondary Education (OU STEP)

363 Pawley Hall

(248) 370-4182

Advising

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 (Oakland University STEP) leading to recommendation for Michigan secondary provisional teacher certification. This certification is valid for teaching content area majors and minors in grades 6-12, except art, foreign language, English as a second language, and music, which are valid for grades K-12. The major areas in which Oakland program participants may become certified to teach are: art, biology, chemistry, English, French, German, Japanese, Spanish, history, mathematics, music and physics. Students may also earn endorsements in Social Studies or Integrated Sciences. Students interested in music education need to contact the Department of Music, Theatre and Dance to learn about content-specific course and sequence requirements. Students interested in K-12 art education should see the requirements of the Department of Art and Art History included in the College of Arts and Sciences section of this catalog.

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 certification. Art and Music majors complete a one-semester internship.

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, history, mathematics, modern languages, 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 also 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 the STEP:

SED 3000 - Introduction to Secondary Education **(4)** or SED 3001 - Public Education for Prospective K-12 Teachers **(2)**
(includes a 50-hour field assignment in the major in addition to course time.)
Overall GPA of at least 2.80 is required to enroll. May only be retaken once. A minimum grade of a B or 3.0 is required for STEP application. Must be completed no less than one semester before application to STEP.

Courses to be taken during the STEP Program:

- DLL 4197 Digital Technologies in the Secondary Classroom (4) (K-12 Art and Modern Language Students may elect DLL 4196 instead.)
- FE 3010 - Educational Psychology for K-12 Educators **(4)** (includes a required field experience)
- RDG 4238 - Teaching Reading in the Content Areas **(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 **(12)**

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, skills, and conduct of members of the teaching profession.

Retention in the SEHS professional education programs

Retention in the SEHS professional education programs is based on the expectation that students will demonstrate the characteristics of, and conduct themselves as members of, the profession as described in the Expected Competencies. Students may be removed from a program, removed from a field placement, or may not be recommended for certification for the following reasons: (i) failure to fulfill any such expectations to Oakland University's satisfaction, including without limitation the expectation that they demonstrate adequate and appropriate communication ability and character and develop, maintain and fulfill their professional relationships, responsibilities and competencies: (ii) academic misconduct; (iii) violations of the Michigan Code of Ethics for Teachers; (iv) failure to fulfill any Oakland University academic or conduct requirements; or (v) violations of any other program or Oakland University's policies, rules, regulations or ordinances.

Students may also be removed from field placements: (i) upon request of a building administrator; (ii) for a failure to comply with the requirements of this Competency and Retention Statement; (iii) if Oakland University determines that removal is in the best interests of the student, Oakland University, the professional education programs or the schools where the student is placed; (iv) inadequate planning, classroom management, and/or discipline; (v) lack of content knowledge; (vi) deficiency in oral or written communication skills; (vii) inappropriate personal or professional behavior; (viii) ethical impropriety; (ix) violation(s) of community standards or policies; or (x) failure to exercise appropriate professional judgments.

Field experiences

SED 3000 /SED 3001 ,FE 3010, SED 4100, SED 4130, RDG 4238, SED 4200, SE 4401, SED 4951 and SED 4952 require field experiences in the public schools, which must be arranged through the SEHS coordinator or director of School and Field Services, (248) 370-3060. Prior or current full- or part-time teaching will not satisfy this requirement. SED 3000 /SED 3001 requires 50 hours of field experience to be completed during the semester in which a student is enrolled. FE 3010 and SED 4100, SED 4130, and RDG 4238 or the equivalent course

requirement for the K-12 Foreign Language or the K-12 Art endorsement programs require 30 hours of field experience to be completed during the semester in which a student is enrolled. (Modern language majors will be required to complete a 30-hour field experience during the semesters they are enrolled in FE 3010, EED 3001, and SE 4401.) If professional courses are taken out of this sequence in the summer semester, an additional field will be required. Sustained experience in diverse settings is required. Students will have experiences in classrooms of their major and minor areas of certification.

SED 4951 in the **fall semester** requires half-day participation at a field school for 3 - 4 hours per day, 4 - 5 days per week. SED 4952 in the **winter semester** requires full-day participation at the field school during the entire student teaching semester.

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.

Applicant eligibility

Eligibility to apply to the OU STEP requires:

1. Completion of SED 3000 /SED 3001 with a minimum grade of a B or 3.0. *This course should be taken at least one semester prior to the semester of application to the program. Student must have documented successful completion of the 40-hour field requirement*.
2. Minimum average GPA of 3.00 in both CAS major and minor.
3. A minimum overall GPA of 2.80.
4. A minimum grade of a B or 3.0 in WRT 1060 - Composition II (or an equivalent course as approved by the registrar's office or the Department of Writing and Rhetoric).
5. Passing scores on the Michigan Basic Skills requirement, currently this requirement is met with an SAT evidence-based reading and writing score of 480 or higher and Math score of 530 or higher. This is not required prior to admission to STEP, but must be completed prior to SED 4951.

Program admission

The process of admission is designed to identify and select a number of well-qualified applicants who demonstrate high potential for success in the teaching profession. This number

is determined by the capacity of the university to provide quality teacher preparation within its resources.

Factors considered in the applicant selection process include GPA, written responses to a set of application questions, field evaluations, and letters of recommendation. 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.

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 4952 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. The program status of a student whose grades or GPA fall below these levels will be placed on hold until deficiencies are remedied.

Students must pass the MTTC subject area test for each major and minor in which they plan to be certified. The state requires one major and one minor for certification. 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.)

Application deadline

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 School and Field Services website.

Courses

AED 4120 - Visual Culture, Theories in Art Education (2)
This course develops knowledge of the theories and historical foundations of art education. Through lectures, readings, and discussion, students will explore historical and current trends in art education and visual culture as they learn to construct effective instruction and curricula in the visual arts using current instructional models and assessment strategies. This course is cross-listed with EST 5120.

AED 4220 - Teaching Art in the Elementary School (4)
This course develops knowledge and skills for teaching art in elementary schools. Through lectures, readings, discussion, and field experience, students explore current trends in art education, visual literacy, and visual culture while constructing and practicing effective instruction and designing curricula in the visual arts using current instructional and assessment strategies. This course is cross listed with EST 5220. Field placement required.
Prerequisite(s): AED 4120 (B)

AED 4221 - Teaching Art in the Middle School (2)
This course is designed to develop knowledge and skills for teaching art in middle schools. Through lectures, readings, discussion and field experience, students explore current trends in art education, visual literacy, and visual culture while constructing and practicing effective instruction and designing curricula in the visual arts using current instructional assessment strategies. This course is cross-listed with EST 5221. Field placement required.
Prerequisite(s): AED 4120 and AED 4220
Corequisite(s): AED 4320

AED 4320 - Teaching Art at the Secondary Level (4)
This course develops knowledge and skills for teaching art at secondary levels. Through lectures, readings, field and studio experience, students explore historical and current trends in art education, visual culture, and visual literacy while constructing effective instruction and curricula in the visual arts using current instructional and assessment strategies. This course is cross-listed with EST 5320. Field placement required.
Prerequisite(s): AED 4120, AED 4220
Corequisite(s): AED 4221

AED 4950 - Internship in Art Education (12)
Provides teaching and other appropriate activities in an area classroom with guidance by university supervisor and cooperating teachers. General and specific instructional interns concerns are explored in multiple concurrent seminars. Completion of a program evaluation is required before a grade is reported to the registrar. Grade (B) or above is required for certification recommendation. May not be repeated.

AED 4996 - Independent Study in Art Education (1 TO 4)
Pursues directed individual reading and research in art education. May include a field placement, as well as development of specific teaching materials. May be repeated for a total of four credits.
Prerequisite(s): permission of department (present written consent by faculty who will supervise study).

EED 1000 - Careers in Teaching and Learning (1)
An introduction to programs and opportunities for students considering teaching as a career. Career information, professional pathways for teachers, diversity in education, and examination of the profession of teaching are major course topics. Successful course completion grants eligibility for enrollment in EED 2001 or SED 3001.

EED 2000 - Exploring K-8 Teaching: Responsibilities and Opportunities in Education (3)
Explores teaching as a profession as it relates to power, responsibilities and opportunities in K-8 learning environments. Assists students in determining whether they possess the desire and skills needed for pursuing teaching as a career. Includes required experiences in various learning environments. Satisfies general education requirement of intensive writing in the major.
Prerequisite(s): WRT 1060

EED 2001 - Advanced Exploration of K-8 Teaching (2)
Students transitioning from community college programs to the Teacher Education Programs at Oakland University will explore teaching as a profession as it relates to power, responsibilities and opportunities in K-8 learning environments. Includes required experiences in various learning environments. Satisfies general education requirement of intensive writing in the major.
Prerequisite(s): EED 1000, WRT 1060

EED 3000 - Instructional Design and Assessment (3 OR 4)
Prepares prospective teachers to design instruction based on best practices including effective use of formal and informal teacher-created assessment techniques in the process of planning,

implementing and evaluating instruction based on standards and benchmarks. Includes a required field experience.
Prerequisite(s): admission to major.

EED 3001 - Managing the Classroom Community for U.S. Diverse Learners (4)
Acquaints prospective teachers with the importance of interactive skills associated with diversity, including race, ethnicity, religion, gender, sexual orientation and/or socioeconomic status as it influences and enhances the classroom community; provides students with the fundamentals of classroom management; requires substantive written assignments. Includes a required urban field experience. *Satisfies the university general education requirement in U.S. diversity. Satisfies the university general education requirement for a writing intensive course in general education or the major, not both. Prerequisite for writing intensive: completion of the university writing foundation requirement.*
Corequisite(s): for Elementary Education major: EED 3000

EED 3220 - Educating Children in Art (3)
Provides students with an understanding of discipline-based art education, a knowledge of children's artistic development, and a commitment to and skills for educating children about the visual arts.
Prerequisite(s): EED 2000 or EED 2001 and EED 3000 and EED 3001 and FE 3010 and DLL 4196

EED 4180 - Health Curriculum at the Elementary-Middle Levels (1)
Students develop understandings related to a rationale for teaching health at the elementary/middle levels by exploring health education content, research, legal requirements, content expectations, and relevant curriculum for teaching health as well as philosophies that guide health education efforts. This is an online course with initial and final meetings on-campus.

EED 4181 - Teaching Fitness and Wellbeing in Elementary and Middle Level Classrooms (2)
Students admitted to K-8 Education Program examine and practice teaching in a supervised peer laboratory setting, gaining experience with a classroom repertoire of PE foundations, unit planning, lesson design, assessment, and overall program evaluation leading to the physiological, biomechanical, social, and emotional health of children.

EED 4230 - Teaching Mathematics at the Elementary-Middle Levels (4)
Assists prospective teachers in developing sound pedagogical strategies and instructional techniques for teaching mathematics in the elementary and middle school. Includes a required field experience.
Prerequisite(s): EED 3000 (B), MTE 2110 (B)

EED 4240 - Foreign Language Teaching Methods in Elementary and Middle School (3)
This course addresses theories, learning styles, multicultural and value issues, ACTFL's Standards for Foreign Language Learning, classroom management, professional growth and other topics of interest suggested by class members. Through examination of these conceptual frameworks students will understand that foreign language classroom fosters creative and communicative language practices. Required field experience.
Prerequisite(s): EED 3000 (B) or SED 4100 (B) or ENG 4000 (B) or ALS 4418 (B)

EED 4260 - Teaching Science at the Elementary-Middle Levels (4)
Develops philosophies, rationale and methods for teaching elementary and middle school science. Explores knowledge and skills for planning instruction, using instructional models, integrating the curriculum, using current instructional materials and evaluating outcomes. Includes a required field experience and additional science teaching experience.
Prerequisite(s): EED 3000 (B), SCS 2060 (B)

EED 4270 - Teaching Social Studies at the Elementary-Middle Levels (4)
Examines instructional objectives and strategies, curriculum materials and evaluative procedures for social studies education grades K-8. Upon completion of the course, students are able to develop, defend and implement an elementary social studies program. Includes a required field experience.
Prerequisite(s): EED 3000 (B)

EED 4910 - International Experiences in a Foreign Country (1)
Through directed study in international settings, students will develop first-hand awareness of cultural diversity. They will explore ways of creating or enriching existing curricular materials with their new found understandings of comparative perspectives at a global level. Cross-listed withSED 4910.

EED 4950 - Internship in Elementary Education (12)
Provides teaching and other appropriate activities in an area classroom with guidance by a university supervisor and a cooperating teacher. General and specific instructional concerns of interns are explored in five or more concurrent seminars. Completion of a program evaluation survey is required before a grade is reported to the registrar. May not be repeated. *Satisfies the university general education requirement for the capstone experience.*
Prerequisite(s): completion of all required program course work, passing scores on elementary education MTTC (Michigan Test for Teacher Certification) exams. Students who are doing an internship in middle school or junior high must also pass the appropriate MTTC subject matter tests.

EED 4996 - Independent Study (1 TO 4)
Pursues directed individual reading and research. May include a field placement as well as development of specific teaching materials. May be repeated for a total of four credits.
Prerequisite(s): permission of department (present written consent by faculty who will supervise study).

SCS 2060 - Science for the Elementary Teacher (4)
Develops science concepts and processes based on recent elementary school curricula in the fields of earth, physical and chemical science. For elementary education majors only; includes laboratory experiences.
Prerequisite(s): grade of (C) in one of BIO 1002, BIO 1004, BIO 1200, BIO 1300, BIO 3000, CHM 1040, CHM 3000, ENV 3080, GEO 1060, PHY 1010, PHY 1040, PHY 1050, PHY 1060, PHY 1200, PHY 1510, or SCI 1000

SCS 4360 - Environmental/Outdoor Education for Elementary/Middle School Levels (4)
Methods, materials and sites for teaching science-related topics in an environmental/outdoor context. Topics may include terrestrial and aquatic ecology, water quality studies, bringing the outdoors indoors, and program planning. Field trips are included. With laboratory. Cross-listed with EST 5360.
Prerequisite(s): SCS 2060 or permission of instructor.

SCS 4996 - Independent Problems in Science Education (1 TO 4)
Individual work in science for educators. Credits may be applied to a major or minor in science for teachers. May be repeated for a total of four credits.
Prerequisite(s): permission of instructor.

SED 1000 - Careers in Teaching and Learning (1)
An introduction to programs and opportunities for students considering teaching as a career. Career information, professional pathways for teachers, diversity in education, and examination of the profession of teaching are major course topics. Successful course completion grants eligibility for enrollment in EED 2001 or SED 3001.

SED 3000 - Introduction to Secondary Education (1 TO 4)
This is the first course in the Secondary Teacher Education Program (STEP) leading to Michigan teacher certification. Eligibility to apply to the OU STEP includes attainment of a grade B or above in SED 3000 and completion of 50 hours of field experience during the semester: 20 hours tutoring and 30 hours observation. Can only be repeated once. Cross-listed with SED 3001. Overall GPA of (B) required to enroll. *Satisfies the university general education*

requirement for a writing intensive course in the major. Prerequisite for writing intensive: completion of the university foundation requirement.

SED 3001 - Public Education for Prospective K-12 Teachers (2)
This is the first course in the Secondary Teacher Education Program (STEP) leading to Michigan teacher certification. Eligibility to apply to the OU STEP includes attainment of a (B) GPA in SED 3001 and completion of 30 hours of field experience during the semester. Can only be repeated once. Overall GPA of (B) required to enroll. Cross-listed with SED 3000. *Satisfies the university general education requirement for a writing intensive course in the major. Prerequisite for writing intensive: completion of the university foundation requirement.*
Prerequisite(s): SED 1000 or adviser approval.

SED 4100 - ST: Teaching Secondary in the Minor Methods (3 OR 4)
Emphasizes the development of teaching strategies and human interaction techniques unique to secondary students. Topics include: discipline, motivation, instructional technology, skill assessment, evaluation, writing and reading across the curriculum, and affective learning. This course is cross-listed with TD 5110.
Prerequisite(s): admission to Secondary Education. Field placement required.

SED 4130 - Teaching in Your Minor Field: Mathematics (4)
Emphasizes the development of mathematics teaching strategies and human interaction techniques unique to secondary students. Topics include: discipline, motivation, instructional technology, skill assessment, evaluation, writing and reading across the curriculum, and effective learning. Field placement required.
Prerequisite(s): admission to secondary education. Minor field mathematics only.

SED 4200 - ST: Teaching Secondary of the Major Methods (3 OR 4)
Develops specific knowledge, competencies and skills required for effective teaching in the student's major field. Field placement required. This course is cross-listed with TD 5210.
Prerequisite(s): admission to Secondary Education and internship placement.

SED 4910 - International Experiences in a Foreign Country (1)
Through directed study in international settings, students will develop first-hand awareness of cultural diversity. They will explore ways of creating or enriching existing curricular materials with their new-found understandings of comparative perspectives at a global level. Cross listed with EED 4910.

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

Provides an academic year internship in an assigned school district under the guidance of a clinical instructor and university instructor. Grade of (B) is required for certification recommendation.
Prerequisite(s): admission to the internship.

SED 4952 - Internship in Secondary Education (4 TO 12)
Provides an academic year internship in an assigned school district under the guidance of a clinical instructor and university instructor. Enrollment for a total of 12 credits is required for completion of the internship. Grade of (B) or above required for certification recommendation. May not be repeated. *Satisfies the university general education requirement for the capstone experience.*
Prerequisite(s): admission to the internship.

SED 4996 - Independent Study in Secondary Education (1 TO 4)
Pursues directed individual reading, research and fieldwork in secondary education. May be repeated for a total of four credits.
Prerequisite(s): permission of department (or written consent by faculty who will supervise study).

SST 3070 - Social Studies for Elementary and Middle School Teachers (3 OR 4)
Social studies integrate ideas from the social sciences and humanities to educate for informed decision-making of the people, by the people, for the people. In SST 3070 students revisit concepts from the disciplines that will inform them when teaching children for conscious participation in a rapidly changing global society. Social studies integrates ideas from the social sciences and humanities to educate for informed decision-making of the people, by the people, for the people. Students revisit concepts from the disciplines that will inform when teaching children for conscious participation in a rapidly changing global society.
Prerequisite(s): Grade of (C) or better in a course identified as meeting Social Science or Western Civilization General Education requirements.

SST 4996 - Independent Study in Social Studies Education (1 TO 4)
Individual work in social studies for educators. Credits may be applied to a major or minor in social studies for teachers. May be repeated for a total of four credits.
Prerequisite(s): permission of instructor.

School of Engineering and Computer Science

301 ENGINEERING CENTER
(248) 370-2217
Fax: (248) 370-4261

Dean: *Louay M. Chamra;* **Executive Secretary:** *Jane Dietrich*

Associate Dean: *Qian Zou;* **Administrative Secretary***: Katie Loodeen*

Business Manager: *Keith Harvey;* **Accounting Clerk IV:** *Barbara Kline*

Financial Analyst: *Esther McCoy*

Director of Undergraduate Advising: *Carmen Etienne*

Academic Advisers: *Kurtis Kirkpatrick, Eman Shammo; Sarah Konrad; Debra Wheeler; Kelly Gianetto*

Office Assistant I: *Marlene McKean*

Director of Career Services: *Kathleen Livelsberger*

Career Consultant: *Kelli Foskic*

Computer Support - Computer Network Administrator: *Nicholas LaForge*

Computer Technologist: *Terrence P. Heinz, Margie Scuhtya*

Communications Manager: *Emily Prawdzik-Genoff*

Director of Recruitment and Outreach: *Krzysztof Kobus*

Assistant Director of Outreach: *Marianne Donoghue*

Laboratory Manager: *Matt Bruer*

Project Engineer: *Pete Taylor*

Machine Shop Assistant: *Derek Hurley*

Major Gift Officer: Anthonie Burke

Advisory Board

The Advisory Board for the School of Engineering and Computer Science (SECS) is composed of leaders in industry. They assist the school in developing educational and research programs to meet the rapidly expanding requirements in the technical world. The board is available as a body or individually for consultation on such matters as curriculum, research, facilities, equipment requirements, special subjects and long-range planning. Board members are:

Robert Fascetti, Chair of Advisory Board. Retired Vice President, Powertrain Engineering, Powertrain Product Development, Ford Motor Company

William H. Mattingly, Vice Chairperson, Advisory Board, Executive in Residence, Third Shore Group

David Agnew, Director, Advanced Engineering, MOBIS Technical Center of North America

Sara Blackmer, President and General Manager, RAVE Computer

Michael Bolon, Retired Senior Vice President, General Dynamics Land Systems, Engineering Design and Land Development

Glenn Denomme, Consultant, Fiat Chrysler Automobiles

Gerald "Gerry" Deren, America's Business Development, Siemens PLM

John Garcia, Principal, Be-Energy Solutions

Grant R. Gerhart, Ph.D., Retired Senior Research Scientist, TARDEC

Richard Haller, Retired, President and Chief Operating Officer, Walbridge

Jim Hassenberger, President, SolidThinking (an Altair Company)

Aftab Khan, Ph.D., Vice President Engineering, Global Innovation, E-Systems, Lear Corporation

Fred Killeen, Chief Technology Officer, General Motors LLC, Information Technology

Bob Lee, Vice President and Head of Engine Powertrain and Electrified Propulsion Systems Engineering, Chrysler Group LLC

Joseph Long, Chief Engineer, Door Systems, Inteva Products

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Juergen Peters, JP & Associates, LLC

Robert Richard, Senior Vice President, Major Enterprise Projects, DTE Energy, Energy Distribution

George Saikalis, Ph.D., Senior Vice President and General Manager, Research and Development, Hitachi America, Ltd.

Kristen Siemen, Executive Director - Global Thermal/HVAC, Engineering and Mexico Engineering, General Motors Corporation

James Toeniskoetter, Chief Operating Officer, Hirotec America

Jeff Van Dorn, Partner, Android Industries, L.L.C

Diana Wagner, Executive Director of Global Cost, Engineering and Methods, Fiat Chrysler Automobiles

Mazin Yousif, Ph.D., Chief Technology Officer, Shell Global Account, T-Systems International

Mission

The overall mission of the School of Engineering and Computer Science (SECS) is threefold:

- to provide high-quality undergraduate and graduate programs of instruction in engineering and computer science to prepare graduates for careers in the coming decades,
- to advance knowledge through basic and applied research in relevant branches of engineering and computer science, and
- to provide service to both the engineering profession and public in the State of Michigan.

In carrying out its mission, the School will address the needs of the automotive and related industries in southeast Michigan for the:

- education of engineers and computer scientists,
- development of research programs, and
- fulfillment of the demands for professional service.

General Information

Accreditation

The undergraduate programs in computer engineering, electrical engineering, industrial and systems engineering, mechanical engineering are accredited by the Engineering Accreditation Commission (EAC) of ABET. The undergraduate computer science program and information

technology program are accredited by the Computing Accreditation Commission (CAC) of ABET. Note: bioengineering program, is expected to pursue ABET accreditation.

Undergraduate programs

The School of Engineering and Computer Science (SECS) offers instruction leading to the degrees of Bachelor of Science in Engineering, with majors in computer, electrical, industrial and systems, and mechanical engineering, and Bachelor of Science, with a major in computer science, and information technology. In addition, programs leading to the Bachelor of Science degree in engineering chemistry, engineering physics and bioengineering are offered jointly with the College of Arts and Sciences.

Through its engineering programs, the SECS prepares students for careers in an industrial-based society. Recognizing that today's engineers must be able to solve complex, highly focused problems, as well as those transcending narrow fields of specialization, the SECS blends an interdisciplinary core with specialized study in the elected major for each program.

Oakland University engineering graduates are prepared to enter the traditional fields of government, product design, development, manufacturing, sales, service and systems analysis - as well as specialized areas, such as robotics, transportation, pollution control, energy systems, computer engineering, communications, medical electronics and automotive engineering. They are also prepared to pursue graduate study for careers in research and teaching. A growing number of students find their undergraduate engineering education is excellent preparation for careers in business, law and medicine.

The baccalaureate program in computer science provides a solid foundation for a career in that field. Since both the engineering and computer science programs are offered within the school, computer science majors are exposed to the software as well as the hardware aspects of the profession. Thus, students in the computer science program prepare themselves for careers in the traditional fields of systems programming, data processing and systems analysis, as well as in such interdisciplinary fields as artificial intelligence, robotics, bioinformatics, computer architecture, computer graphics, pattern recognition and scientific computation. The baccalaureate program in information technology is focused on the applied aspects of software technology. The program provides sufficient technical depth and a comprehensive understanding of information technology in the context of problem-solving relevant to both engineering and service industries. The SECS also offers minors in computer science and in computing or information technology.

Professional Societies

The school has a number of professional societies such as the Association of Computing Machinery (ACM), Aerial Systems Club (ASC), American Society of Mechanical Engineers (ASME), Engineering in Medicine and Biology Society (EMBS), Engineering Society at Oakland University (ESOU), For Inspiration and Recognition of Science and Technology (FIRST Robotics),

Institute of Electrical and Electronics Engineers (IEEE), International Association for Hydrogen Energy (IAHE), Institute of Industrial and Systems Engineers (IISE), Oakland Robotics Association (ORA), SAE (formerly known as Society of Automotive Engineers) , Society of Women Engineers (SWE), National Society of Black Engineers (NSBE), National Society of Professional Engineers (NSPE), Theta Tau fraternity and honor societies Eta Kappa Nu and Tau Beta Pi. Students are encouraged to become active members of one or more of these organizations.

Graduate programs

The SECS offers programs leading to the Master of Science degree in 1) computer science, 2) software engineering and information technology, 3) cyber security 4)electrical and computer engineering, 5) embedded systems, 6) mechatronics systems engineering, 7) industrial and systems engineering, 8) mechanical engineering, and 8) systems engineering. The SECS also offers programs leading to Doctor of Philosophy degrees in 1) computer science and informatics, 2) electrical and computer engineering, 3) mechanical engineering, and 4) systems engineering; the Ph.D. in Systems Engineering program is a school-wide program allowing for a blending of various disciplines. The school also offers a Master of Science degree in engineering management in cooperation with the School of Business Administration. For more information, see the Oakland University Graduate Catalog.

Centers/Institutes

Center for Robotics Unmanned and Intelligent Systems (CRUIS)

The Center will facilitate opportunities for OU faculty to lead start-up initiatives to work with business and government agencies to transition technical knowledge from academia to industry commercialization opportunities by enabling a research, development, test and evaluation capabilities. CRUIS will seek opportunities to support robotics and unmanned systems challenges in the defense industry that will lead to development of expertise that can be translated to various sectors - security, commercial, social, medical and others that are mainstream to our daily lives.

Fastening and Joining Research Institute (FAJRI)

Fastening and joining significantly affects the safety, quality and reliability of many mechanical and structural systems, machinery and equipment. The FAJRI is the only known academic facility of its kind in the world dedicated solely to the research and development of fastening and joining of materials in industries such as automotive, aerospace and nuclear. The research programs at FAJRI benefit both the commercial and defense sectors of the economy, while improving the safety of the public.

Automotive Tribology Center (ATC)

The Automotive Tribology Center is an academic research unit within the Mechanical Engineering department. It is the only university research center in the United States that is dedicated to automotive tribology research and is uniquely positioned to advance the reliability, mobility and efficiency of automotive components. The ATC is mainly dedicated to performing fundamental and applied research that lowers frictional energy losses. Particular emphasis is placed on engine and transmission tribology. The research results of ATC benefit the US military and different governmental and industrial sectors of the economy.

Clean Energy Research Center (CERC)

Energy affects all aspect of our lives from the economy to recreation to health care. The Clean Energy Research Center explores sustainable ways to meet our future energy needs utilizing unique renewable energy feed sources, from biomass to wind to solar with a focus on overall energy conservation. The CERC has launched an academic effort to teach and train the next generation of students on energy issues, has begun the green campus initiative to demonstrate the benefit of alternative energy technology on campus, and continues to perform research towards developing environmentally friendlier technologies.

Chrysler Learning and Innovation Center for Sheet Metal Forming Technology (CLIC-form)

Chrysler Learning and Innovation Center for Sheet Metal Forming prepares OU students to work in sheet metal stamping manufacturing environment by learning stamping processes and equipment, die design and manufacturing methods, materials for tools and sheet metal components. A unique feature of CLIC-form is its highly selective, industry-hosted academic program in which OU undergraduate and graduate students take classes and conduct stamping related research during the academic year and participate in industrial projects during the summer interacting with faculty members and industry experts who specialize in sheet metal stamping.

Center for Advanced Manufacturing and Materials (CAMM)

Center of Advanced Manufacturing and Materials (CAMM) is a unique research center in North America specializing in sheet metal stamping and joining with substantial emphasis on tool wear, and mechanics of material fracture in stamping and joining operations, and performance of sheared edges of stamped panels. CAMM includes a fully automated press cell capable of physically simulating interactions of die surface with sheet metal taking into consideration specific lubrication and coating conditions for variety of high volume sheet metal stamping processes. CAMM is developing innovative sheet metal forming and joining processes achieving substantial enhancement of formability of lightweight materials. CAMM also serves as a base for CLIC-Form center.

Hardware in the Loop (HIL)

Hardware-in-the-loop (HIL) simulation is used widely in the development and testing of complex real-time embedded systems, such as automotive engine controllers. The OU HIL Lab is a unique multi-disciplinary academic facility, which was established in 2012 with support from Chrysler LLC, and is located in Dodge Hall. The HIL lab contains five automotive-hardware-in-the-loop simulators that allow testing and development of production and prototype engine and transmission controllers using simulated (software) automobiles. Research projects have included fuel economy strategies, engine thermal modeling, and advanced control techniques for transmission shift control.

Admission

High school preparation

Entering engineering and computer science freshmen should have taken at least four years of high school mathematics, including trigonometry, and should have a strong grasp of English composition. Additional preparation should include coursework in chemistry and physics. Exposure to computer aided design (CAD), machine shop tooling, computer programming and electronics shop devices is useful, but is not required for admission. Entering information technology freshmen should have at least three years of high school mathematics with some preparation in science. Normally, a 3.0 (B) grade-point average is required for admission into the SECS programs.

Transfer policy

The programs offered by the SECS are designed to meet accreditation criteria, as well as to reflect the Oakland University philosophy of education. The programs are more than an assemblage of courses; they are designed to blend theory and experiment, and to integrate fundamental mathematical and scientific backgrounds into advanced analysis and design work.

To ensure the integrity of its programs, the SECS has adopted the following transfer policy: Records of students transferring to Oakland University from other academic institutions are evaluated and transfer credit is granted as appropriate. Students may transfer applicable community college credits at any time during their course of study. However, at least one-half of the credits required for completion of a specific baccalaureate degree program must be from regionally accredited four-year institutions, with at least 32 credits earned at Oakland University.

Students planning to transfer into one of the engineering programs should present the following: four semester courses in analytic geometry and calculus, including linear algebra and differential equations; two semester courses in introductory calculus-based college physics; and one or two semester courses in chemistry. Other credits in mathematics, science or engineering will be evaluated with reference to engineering graduation requirements. Technician course credits generally do not apply to these requirements. Community college students who plan to transfer into an engineering program are advised to follow the transfer equivalency guides

found on Oakland University's website. Students planning to transfer into the computer science program should complete one year of coursework in calculus, one course in linear algebra, one course in discrete mathematics if possible and two semester courses in introductory calculus-based physics. A course in programming in a high-level language is desirable. Whenever possible, further coursework in computer science should be planned with an Oakland University adviser to ensure compatibility with university requirements. Students transferring into the information technology program should include a course in calculus, a course in statistics, and a course in a science elective. A course in programming in a high level language is also desirable.

Transfer students from **non-ABET-accredited foreign institutions** must complete a minimum of 20 credits in their major program of study (professional subjects) at Oakland University including the capstone design course. All of the courses presented for transfer from such programs must receive school approval, before the student receives official transfer credit. See Transfer Student information for additional details.

Internal transfer

Oakland University students wishing to transfer into engineering or computer science programs in the SECS from other majors, undecided status, or engineering/computer science candidate status will be considered upon the completion of the following courses: MTH 1554, MTH 1555; PHY 1610 and PHY 1620. Engineering physics students must complete PHY 1510 and PHY 1100 as well as PHY 1520 and PHY 1110 in addition to MTH 1554, MTH 1555. Similarly, students wishing to transfer into the information technology program will be considered upon completion of MTH 1554 or MTH 1222, STA 2221, APM 1663 and an approved science elective. An overall Oakland University GPA of 2.6 is also required.

Academic Advising and Plans of Study

The programs of study for all entering freshmen are focused toward acquiring math, science, writing and programming skills. One of the early courses taken by engineering students is EGR 1200, Engineering Graphics and CAD, which introduces students to the special software tools used in engineering. In consultation with the faculty mentors and advising office, students should ensure that they satisfy all of the requirements of their programs of study.

The school's academic advising office oversees specific program requirements. Students who have questions about transfer credit, academic standing, major standing, petitions or the details of degree requirements should consult an academic adviser in the SECS Undergraduate Advising Office. Students of the SECS must complete a Plan of Study form, which is a timetable of courses to be taken for undergraduate credit. They should complete the form as early as possible, but no later than the end of the semester in which they complete 48 credits. Transfer students should consult with an academic adviser when they enter Oakland University, and complete a Plan of Study form. Students are responsible for updating their plans regularly, preferably each semester. Although advisers are obligated to help students plan their

programs, the responsibility for fulfilling degree requirements remains with students. The SECS Undergraduate Advising Office is located in 255 Engineering Center, (248) 370-2201.

Degree Requirements

General requirements for the baccalaureate degrees

The following general requirements must be met by students seeking a bachelor's degree in computer engineering, electrical engineering, industrial and systems engineering, mechanical engineering, engineering chemistry, engineering physics, bioengineering, computer science, and information technology:

1. Complete at least 128 - 130 total credits (See the corresponding program description for the exact total). At least 32 credits must be in courses at the 3000 level or above.
2. Complete at least 32 credits at Oakland University (Refer to the transfer policy of the SECS for further clarification.) The credits taken at Oakland must include the following for students majoring in computer, electrical, industrial and systems, or mechanical engineering: at least 24 credits in engineering core or professional subjects required for the major; engineering chemistry, engineering physics, and bioengineering: at least 16 credits in required engineering courses, and 16 credits in chemistry or physics or biology courses required for the major; Computer science: at least 24 credits in computer science courses required for the major. Information Technology: at least 24 credits in information technology courses required for the major.
3. Fulfill the university General Education Requirements (see below and in the Oakland University Undergraduate Degree Requirements section of this catalog).
4. Be admitted to major standing in the major of the student's choice.
5. Complete the requirements specified for the elected major.
6. Earn a cumulative grade point average of at least 2.0 (C) in courses taken at Oakland University.
7. All students must apply to graduate by submitting an Application for Degree online.

Writing foundation, writing intensive, and U.S. diversity

The baccalaureate degree requirements include completion of WRT 1060, with a grade of C or higher to satisfy the university general education requirement in writing as part of the foundations area. Students who believe their skills warrant exemption from WRT 1060 may also submit a portfolio. (Refer to the Oakland University Undergraduate Degree Requirements section of this catalog). Students must also satisfy requirements for a writing intensive course in general education, a writing intensive course in the major, a U.S. diversity course, and a capstone course (please refer to the Oakland University Undergraduate Degree Requirements section of this catalog).

General education requirements

The General Education Requirements are comprised of three parts: Foundations, Exploration, and Integration. In addition, U.S. Diversity requirements must also be met. For details, refer to the General Education section of the catalog.

Foundations:

1. Writing foundations as indicated above.
2. Formal Reasoning (Satisfied by MTH 1222 or MTH 1554 for IT majors. Satisfied by MTH 1554 for all other majors.)

Exploration:

3. Art
4. Foreign Language and Culture
5. Global Perspective
6. Literature
7. Natural Science and Technology (Satisfied by EGR 2400 or EGR 2500 for engineering and computer science majors. Satisfied by BIO 1200, PHY 1510 and PHY 1100, CHM 1440 and CHM 1470, or ENV 3080 for IT majors.)
8. Social Science (Engineering majors must take one of the following: ECN 1500, ECN 2010, ECN 2020 or ECN 2100.)
9. Western Civilization (All Engineering, Engineering Science, Computer Science and Information Technology majors are required to take PHL 1310 **- Introduction to Ethics in Science and Engineering** to satisfy the general education requirement in Western Civilization.)

Integration:

10. Knowledge Applications (Satisfied by MTH 1555 for engineering and engineering science majors. Satisfied by APM 1663 for IT majors.)

Capstone: SECS students with majors in engineering and computer science, satisfy these areas by virtue of their required courses. However, information technology majors must take a course from the natural science and technology knowledge exploration area.
U.S. Diversity: May be met by an approved course in the Explorations area.

Engineering core

All engineering programs in the SECS have a common core program consisting of the following courses:

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)**

This core program introduces students to the nuances of the interdisciplinary nature of engineering and lays the foundations for the specialized studies in the student's major fields of study. These courses also provide substantial, real world laboratory experiences to students. It is important that students successfully complete these courses in order to achieve major standing (see below).

Major standing

To enroll in 3000- or 4000- level courses and to become candidates for the baccalaureate degree, students of the SECS must gain major standing in their selected majors. An application for major standing should be submitted during the semester in which students complete all requirements for major standing. Forms may be obtained from the SECS Undergraduate Advising office. For detailed requirements, please see the catalog for each individual program.

Typical schedule for the first two years (The following is a sample schedule for Mechanical Engineering students)

	Fall	**Winter**
Year 1	MTH 1554	MTH 1555
	CHM 1430	PHY 1610
	EGR 1200	EGR 2400
	EGR 1400	Gen. Ed.
	Gen. Ed.	
Year 2	APM 2555	MTH 2554
	PHY 1620	EGR 2600
	EGR 2500	EGR 2800
	Gen. Ed.	Gen. Ed.

Scheduling depends on students' selected majors, but should be tailored to meet the requirements for admission to major standing promptly. For sample schedules, refer to the department listings in this catalog or to the student handbook of the SECS. Students who are not prepared to enter the mathematics and science courses without additional preparation in these subject areas must modify their schedules accordingly. Such students may require additional time to complete degree requirements, unless they make up the deficiencies by enrolling during the summer semester following the freshman year.

Course load

Students should strike a balance between course load and other commitments. In general, students carrying a full load of 16 credits per semester should not be employed for more than 10 to 20 hours per week. Students who are employed 40 hours per week generally should not carry a course load of more than four credits per semester. The university's maximum course load policy is detailed in the Academic Policies and Procedures section (see Course and credit system).

Graduation check

To ensure that students have met all requirements, they must participate in a final program audit during the semester preceding the one in which they expect to graduate. A preliminary Graduation Review form should be submitted to the Academic Adviser in the SECS Undergraduate Advising Office.

Internships

Many employers seek SECS students for internship employment. Therefore, those SECS students who wish to combine relevant work experience with their college education are encouraged to participate in internship programs in association with engineering or computer science related employers. Participation in job fairs, which are hosted by the Oakland University Career Services, is often helpful for securing internships. To prepare for internship opportunities, SECS students should list their resume and participate in interview skills training through the Career Services office in 154 North Foundation Hall.

Double Major

To earn two majors in engineering or in engineering and computer science, students must complete all the requirements of both programs. Further, in addition to the credit hours needed for one major, the student must complete a minimum of 12 credit hours in pertinent technical courses applicable to the second major. Students seeking two degrees should consult the university's requirements (see Additional undergraduate degrees and majors).

Minors and Concentrations

Students who wish to add a minor or concentration or otherwise participate in an interdepartmental program must apply for admission and seek assistance in planning a program. Application may be made to the coordinator of the appropriate program committee or department involved. Students in the School of Engineering and Computer Science might be interested in the following minors or concentrations: Applied mathematics, applied statistics, biology, chemistry, economics, environmental studies, linguistics, and physics. For details, see Other Academic Options in the College of Arts and Sciences portion of the catalog. Other areas of interest might be: accounting, finance, general business, management information systems, production and operations management, and quantitative methods. For

details on these, see Minors in the School of Business Administration portion of the catalog. The School of Engineering and Computer Science offers the following minors:

Minor in International Orientation (for SECS students)

Coordinator: *Lunjin Lu*
In view of the ever-increasing globalization of industry, students in engineering and computer science need to be aware of their international opportunities and also to develop an intellectual background that enhances their ability to respond to professional challenges in the global environment. To obtain a minor in international orientation, engineering/computer science students must complete the following courses with a grade of at least C in each course:

Requirements

- ECN 2000 - Principles of Macroeconomics (4) or ECN 2020 - Principles of Global Macroeconomics (4)
- ECN 2100 - Principles of Economics (6)
- 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 - Introduction to China (4)
- IS 2200 - Introduction to Japan (4)
- IS 2300 - Introduction to Africa (4)
- IS 2400 - Introduction to India (4)
- IS 2500 - Introduction to Latin America (4)
- IS 2600 - Introduction to Russia and Eastern Europe (4)
- HST 3400 - Europe Since 1914 (4)

Note: 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.

Additional Minors (not open to computer science, computer engineering or information technology students)

- Minor in Computer Science (See description in Department of Computer Science section.)
- Minor in Computing (See description in Department of Computer Science section.)
- Minor in Information Technology (See description in Department of Computer Science section.)

Additional Information

Prerequisite courses

In planning their schedules, students should ensure that they satisfy prerequisite and corequisite conditions for courses, as listed under "Course Offerings." Students will have their registrations canceled if they register for courses for which they do not meet the prerequisite or corequisite conditions. Students will be liable for any financial penalties incurred by such cancellation.

Project and independent study courses

Project and independent study courses numbered 4900 and 4950 are available to provide enrichment opportunities to qualified students. They are not intended as substitutes for regular course offerings; rather, they allow students to investigate areas of interest outside the scope of regular courses, examine subjects more deeply than can be accommodated in regular courses, or gain educational experiences beyond that of regular coursework. To register for a project or independent study course, students must first submit a plan of work to the faculty member who will supervise the course. The plan must be approved in writing by the faculty member and the chair of the major department before students may register for the course.

Application forms are available in the departmental offices.

Petitions

Waivers of specific academic requirements may be initiated by submitting a petition of exception (see Petition of exception). Students seeking a review of their academic standing within the school or students who wish to make a formal complaint should submit a written petition to the chair of their major department or to the SECS associate dean. Petitions will be processed according to established university procedures.

Academic conduct

Students are expected to abide by the principles of truth and honesty, which are essential to fair grading. Academic misconduct in any form is not permitted. Students who are found guilty of academic misconduct as determined by the university Academic Conduct Committee, in any course offered by the school, may be subject to penalties that range from a reduced grade for the assignment, a grade of "F" for the entire course, academic probation, suspension or dismissal from the university. All assignments must be the independent work of each student, unless the professor of the course gives explicit permission relaxing this requirement. See the *Academic Conduct Policy* section of the catalog for more detailed information.

Academic standing

The performance of students in the School of Engineering and Computer Science will be reviewed at the end of each semester to determine academic progress. Good academic

standing in the school requires a cumulative grade-point average of at least 2.0 (C) in: a) courses required for the major; b) cognate courses in mathematics and science; and c) all courses taken at Oakland University. Students whose cumulative grade-point averages fall below 2.0 (C) in one or more of the three categories will be placed on probation status.

Students who fail to correct the conditions leading to probation after one semester are generally ineligible to continue their programs. However, probation status may be continued if students are judged to be making substantial progress toward correcting the deficiency. (For part- time students, 12 consecutive credits of coursework will be considered equivalent to one semester.

Students on probation status may not serve on committees of the School of Engineering and Computer Science. Students who become ineligible to continue enrollment in the School of Engineering and Computer Science may transfer to another school or college within the university subject to their requirements.

The above rules were established by the undergraduate curriculum committee of the School of Engineering and Computer Science. Students wishing to appeal a ruling on their academic status must address a written petition to the School's committee on academic standing. Petitions may be submitted to an SECS academic adviser or to the SECS associate dean.

Unsatisfactory performance

Unsatisfactory (U) grades and grades less than C are considered substandard. A student within the School of Engineering and Computer Science who repeats a course in which a grade below C has been earned must repeat that course at Oakland University. Courses in which a grade below C has been earned may not be subsequently passed by competency examination or independent study. See repeating courses for additional information.

Honors, awards and scholarships

The School of Engineering and Computer Science may, at its discretion, confer departmental honors on students who have completed a minimum of 62 credits in the School and demonstrated a high level of scholarly accomplishment by achieving a GPA of 3.5 or higher in SECS courses.

Each year the faculty selects graduating seniors to receive four special awards: Exceptional Achievement, Academic Achievement, Professional Development, and Service. In addition to scholarships available to all Oakland University students, the School of Engineering and Computer Science offers additional scholarship opportunities. Information about these opportunities may be found on the SECS website.

Course Offerings

Courses offered through the School of Engineering and Computer Science carry the following designations: computer science and information technology courses, CSI; electrical and computer engineering courses, ECE; industrial and systems engineering courses, ISE; mechanical engineering courses, ME. Courses offered under the general title of engineering are listed under EGR. For some of the courses, the semester(s) in which they are usually offered is indicated at the end of the course description. However, this is subject to change. To register for 3000- and 4000-level courses, students must have attained major standing. Schedule of classes

Department of Computer Science and Engineering

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546 ENGINEERING CENTER

(248) 370-2200

FAX: (248) 370-4625

Chairperson: *Lunjin Lu*

Professors emeriti: *David E. Boddy, Glenn A. Jackson, Janusz W. Laski, Sarma R. Vishnubhotla, Thomas G. Windeknecht*

Professors: *Huirong Fu, Ishwar K. Sethi, Gautam Singh*

Associate professors: *Debatosh Debnath, Dae-Kyoo Kim, Lunjin Lu, Nilesh Patel, Guangzhi Qu, Mohammad-Reza Siadat*

Assistant professors: *Mehdi Bagherzadhi, Jingshu Chen, Erik Fredericks, Anyi Liu, Khalid Mahmood, Hua Ming*

Visiting assistant professors: *Shital Joshi, Chaoyang Li, Xiaotong Lin*

Special instructor: *Laura Dinsmoor*

Lecturer: *Mary Schmotzer*

Adjunct faculty: *Preston Brooks, Theresa Rowe*

Advisory Board

The Computer Science and Engineering Advisory Board assists the department in enhancing its educational and research programs and ensuring their relevance to current and emerging technological needs. Board members are:

Tony Baker, EflexSystems

Linda Daichendt, Mobile Technology Association of Michigan

Laura Dillon, Ph.D., Michigan State University

Fred Killeen, General Motors Company

Gerald R. Lane, Great Lakes Systems & Technology

Gregory Mason, President, USDI

Jason Prater, PLEX Systems

Steve Polakowski, ESG Automotive Inc

Theresa Rowe, Oakland University

Ramasamy Uthurusamy, Ph.D., retired, Emerging Technologies, General Motors

Lawrence C. Wehner, Application Software Executive, Hewlett-Packard

Andre Weimerskirch, Lear Cooperation

General Information

The Department of Computer Science and Engineering carries out the mission of the School of Engineering and Computer Science by offering separate undergraduate majors in Computer Science and Information Technology. The department also offers masters programs in Computer Science, Cyber Security, Software Engineering and Information Technology, and a Ph.D. program in Computer Science and Informatics. The undergraduate programs in the Department of Computer Science and Engineering are accredited by the Computing Accreditation Commission of the Accreditation Board of Engineering and Technology (ABET).

Schedule of classes

Specific offerings for each semester may be found in the Schedule of Classes.

The 5000 level CSI courses are graduate level courses. These are open to undergraduate students with instructor permission and major standing (See Graduate Catalog for descriptions).

- CSI 5220 Objective Oriented Analysis and Design
- CSI 5380 Software Verification and Testing
- CSI 5420 Software Architecture and Components
- CSI 5490 Wireless and Industrial Networks
- CSI 5550 Visual Computing
- CSI 5810 Information Retrieval and Knowledge Discovery
- CSI 5830 E-Commerce and ERP

Programs

- Computer Science Minor
- Computer Science, B.S.
- Computing Minor
- Information Technology Minor
- Information Technology, B.S.

Computer Science Minor

The School of Engineering and Computer Science offers three minors, computer science minor, computing minor, and information technology minor, to students with majors other than computer science, computer engineering, and information technology.

Computer science

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. At least 12 of these credits must be taken at Oakland University. A grade of C is required in each course for this minor. Students must earn a minimum of 20 credits, including the following courses:

- CSI 1420 - Introduction to C Programming and Unix **(4)**

- CSI 2300 - Object-Oriented Computing **(4)**

Minor in computing and minor in information technology

The minors in computing and information technology are suitable for students with a major in liberal arts, business, or health sciences who may wish to emphasize applied data processing aspects of computing and information technology. At least 12 of the minor credits must be earned at Oakland University. An average grade of at least 2.0 (C) is required in courses counted toward this minor. Students must earn a minimum of 20 credits as follows for a minor in Computing: CSI 1200, CSI 1300 and 12 credits of 2000 level CSI courses. At least 12 of the minor credits must be earned at Oakland University. An average grade of at least 2.0 (C) is required in courses counted toward this minor. For an IT minor, students must earn a minimum of 20 credits in the following courses: CSI 1200, CSI 1220, CSI 1300, or CSI 1310 and any two courses from CSI 2300, CSI 2470, and CSI 2520 . At least 12 of these credits must be taken at Oakland University.

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 team work. 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, satisfy the general education requirements (also see Undergraduate degree requirements) and meet the following requirements:

General education (excluding math and science) -- 28 credits

- Students are required to take PHL 1310 - Introduction to Ethics in Science and Engineering to satisfy the general education requirement in Western Civilization.
- 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 -- 29 credits

- 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)**
- PHY 1510 - Introductory Physics I **(4)** and PHY 1100 General Physics Lab I **(1)***
- PHY 1620 - Fundamentals of Physics II **(4)** *

* PHY 1510 and PHY 1100 must be taken concurrently.

PHY 1620 does not satisfy the university general education requirement in the natural science and technology knowledge exploration area. Credit for both PHY 1520 and PHY 1620 is not permitted.

Computer science core -- 22 credits

- CSI 1420 - Introduction to C Programming and Unix **(4)**

- EGR 2400 - Introduction to Electrical and Computer Engineering **(4)**
- CSI 2300 - Object-Oriented Computing **(4)**
- CSI 2310 – Data Structures (4)
- CSI 2999 - Sophomore Project **(2)**
- CSI 3640 - Computer Organization **(4)**

Required professional subjects -- 32 credits

- CSI 2470 - Introduction to Computer Networks **(4)**
- CSI 3610 - Design and Analysis of Algorithm **(4)**
- CSI 3350 - Programming Languages **(4)**
- CSI 3370 - Software Engineering and Practice **(4)**
- CSI 3430 - Theory of Computation **(4)**
- CSI 3450 - Database Design and Implementation **(4)**
- CSI 4500 - Fundamentals of Operating Systems **(4)**
- CSI 4999 - Senior Capstone Project **(4)**

Professional training -- 4 credits

Select one of the following courses:

- CSI 4950 - Internship **(4)**
- CSI 4995 - Undergraduate Research **(4)**

Professional track -- 8 credits

Select courses from one of the following professional tracks:

- Computational Intelligence (CSI 5130, CSI 5810) **(8)**
- System Administration Track (CSI 3660, CSI 3670) **(8)**
- Bioinformatics Track (BIO 3400, CSI 4780) **(8)**

- Computer Security Track (CSI 4480, MTH 4772) **(8)**

Professional electives -- 5 credits

Any 3000, 4000, or 5000 level engineering or computer science or information technology courses.

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 of the following 5000 level courses (with departmental approval):

- **CSI 5220 Objective Oriented Analysis and Design (4)**
- **CSI 5380 Software Verification and Testing (4)**
- **CSI 5420 Software Architecture and Components (4)**
- **CSI 5490 Wireless and Industrial Networks (4)**
- **CSI 5550 Visual Computing (4)**
- **CSI 5810 Information Retrieval and Knowledge Discovery (4)**
- **CSI 5830 E-Commerce and ERP (4)**

Any math or science 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)**

- BIO 1200 - Biology I **(4)**
- CHM 1430 - Chemical Principles **(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)**
- or others by approved petition to the SECS Committee on Academic Standing

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.

To gain major standing in Computer Science, students must:

A) have an average of at least 2.0 in the following mathematics and science courses: MTH 1554, MTH 1555, MTH 2775, APM 2663, PHY 1510, PHY 1620.

B) have an average of at least 2.0 in the following computer science core courses: EGR 2400, CSI 2300, 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. Students may petition to repeat a course a fourth time.

E) have not repeated more than three different courses. 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.

Performance requirements

In addition to previously stated requirements, satisfactory completion of the program requires an average grade of at least 2.0 (C) within each group: namely, mathematics and sciences, core subjects and professional subjects. Within professional subjects, at most two grades below C are permitted, at most two different courses may be repeated and a total of three attempts is permitted.

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)**
- **WRT and general education (8)**

Winter semester -- 17 credits

- MTH 1555 - Calculus II **(4)**
- PHY 1510 - Introductory Physics I **(4)** and PHY 1100 General Physics Lab I (1)
- CSI 2300 - Object-Oriented Computing **(4)**
- **General education (4)**

Sophomore year

Fall semester -- 16 credits

- APM 2663 - Discrete Mathematics **(4)**
- CSI 2310 - Data Structures **(4)**
- EGR 2400 - Introduction to Electrical and Computer Engineering **(4)**
- PHY 1620 - Fundamentals of Physics II **(4)**

Winter semester -- 18 credits

- MTH 2775 - Linear Algebra **(4)**
- CSI 2470 - Introduction to Computer Networks **(4)**
- CSI 2999 - Sophomore Project **(2)**
- **General education (8)**

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 3350 - Programming Languages **(4)**
- CSI 3430 - Theory of Computation **(4)**
- CSI 3370 - Software Engineering and Practice **(4)**
- **General education (4)**

Senior year

Fall semester -- 16 credits

- **Professional Elective (4)**

- CSI 3450 - Database Design and Implementation **(4)**
- **One professional track course (4)**
- **Professional training (4)**

Winter semester -- 13 credits

- **Professional elective (4)**
- CSI 4500 - Fundamentals of Operating Systems **(4)**
- CSI 4999 - Senior Capstone Project **(4)**
- **One professional track course (4)**

Computing Minor

The minor in computing 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.

Students must earn a minimum of 20 credits as follows for a minor in Computing

- CSI 1200 - Introduction to Computing and Programming using Excel **(4)**
- CSI 1300 - Introduction to Computer Programming **(4)**

and three courses chosen from

- CSI 2470 - Introduction to Computer Networks **(4)**
- CSI 2520 - Interactive Web Systems **(4)**
- CSI 2300 - Object-Oriented Computing **(4)**

Note

At least 12 of these credits must be taken at Oakland University. An average grade of at least 2.0 (C) 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 4000 levels.

Information Technology Minor

The minor in information technology are 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)**
- CSI 1220 - Computer Animation **(4)**
- CSI 1300 - Introduction to Computer Programming **(4)**

and any two courses from

- CSI 2300 - Object-Oriented Computing **(4)**
- CSI 2470 - Introduction to Computer Networks **(4)**
- CSI 2520 - Interactive Web Systems **(4)**

Note

At least 12 of these credits must be taken at Oakland University. An average grade of at least 2.0 (C) 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 4000 levels.

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, the general education requirement (also see Undergraduate degree requirements) and meet the following requirements:

General education (excluding math and science) -- 28 credits

- Students are required to take PHL 1310 - Introduction to Ethics in Science and Engineering to satisfy the general education requirement in Western Civilization.
- 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 -- 16 credits

- 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

*Approved science electives for information technology majors are: biology courses numbered BIO 1200 or BIO 1300; CHM 1440 and CHM 1470; ENV 3080, PHY 1510 and PHY 1100.

Information technology core -- 22 credits

- CSI 1200 - Introduction to Computing and Programming using Excel **(4)**
- CSI 1310 - Computer Programming **(4)**
- CSI 2300 - Object-Oriented Computing **(4)**
- CSI 2470 - Introduction to Computer Networks **(4)**
- CSI 2520 - Interactive Web Systems **(4)**
- CSI 2999 - Sophomore Project **(2)**

Required professional subjects -- 32 credits

- CSI 2440 - Computer Systems **(4)**
- CSI 3370 - Software Engineering and Practice **(4)**
- CSI 3450 - Database Design and Implementation **(4)**
- CSI 3500 - Human Computer Interaction **(4)**
- CSI 3520 - Systems Analysis **(4)**
- CSI 3660 - System Administration **(4)**
- CSI 4480 - Information Security Practice **(4)**
- CSI 4999 - Senior Capstone Project **(4)**

Professional track -- 8 credits

Choose coursework from only one of the following tracks:

System Administration Track

- CSI 3670 - Advanced System Administration **(4)**
- CSI 3680 - Script Programming **(4)**

Bioinformatics Track

- BIO 3400 - Genetics **(4)**
- CSI 4780 - Bioinformatics **(4)**

Professional training -- 4 credits

- CSI 4950 - Internship **(4)**
- CSI 4955 - Industrial Project **(4)**
- CSI 4995 - Undergraduate Research **(4)**

Management and communications -- 8 credits

Choose two of the following courses:

- COM 2403 - Group Dynamics and Communication **(4)**
- COM 3401 - Communication in Organizations **(4)**
- CSI 4410 - CIT Project Management **(4)**

Electives -- 10 credits

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.

To gain major standing Information Technology, students must:

A) have an average of at least 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 of at least 2.0 in the following information technology core courses: CSI 1200, CSI 1310, CSI 2300, CSI 2470, CSI 2520, 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. Students may petition to repeat a course a fourth time.

E) have not repeated more than three different courses. 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.

Performance requirements

In addition to previously stated requirements, satisfactory completion of the program requires an average grade of at least 2.0 (C) within each group: namely, mathematics and sciences, core subjects and professional subjects. Within professional subjects, at most two grades below C are permitted, at most two different courses may be repeated and a total of three attempts is permitted.

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

- MTH 1222 - Calculus for the Social Sciences **(4)** or MTH 1554 - Calculus I (4)
- CSI 1310 - Computer Programming **(4)**
- **WRT and general education (8)**

Winter semester -- 16 credits

- CSI 1200 - Introduction to Computing and Programming using Excel **(4)**

- STA 2221 - Introduction to Statistical Methods **(4)**
- CSI 2300 - Object-Oriented Computing **(4)**
- **General education (4)**

Sophomore year

Fall semester -- 16 credits

- APM 1663 - Mathematics for Information Technology **(4)**
- CSI 2470 - Introduction to Computer Networks **(4)**
- CSI 2520 - Interactive Web Systems **(4)**
- **General education (4)**

Winter semester -- 16 credits

- CSI 2440 - Computer Systems **(4)**
- CSI 2999 - Sophomore Project **(2)**
- **Science elective (4)**
- **General education (4)**
- **Elective (2)**

Junior year

Fall semester -- 16 credits

- CSI 3370 - Software Engineering and Practice **(4)**
- CSI 3500 - Human Computer Interaction **(4)**
- CSI 3660 - System Administration **(4)**
- **Management and communications (4)**

Winter semester -- 16 credits

- CSI 3450 - Database Design and Implementation **(4)**

- CSI 3520 - Systems Analysis **(4)**
- **Professional track (4)**
- **General education (4)**

Senior year

Fall semester -- 16 credits

- **Professional training (4)**
- **General education (4)**
- **Professional track (4)**
- **Elective (4)**

Winter semester -- 16 credits

- CSI 4480 - Information Security Practice **(4)**
- **Management and Communications course II (4)**
- CSI 4999 - Senior Capstone Project **(4)**
- **Elective (4)**

Courses

CSI 1100 - Computer Literacy (2)
An introduction to the use of desktop computers. Topics include word processing, spreadsheets, PowerPoint, and the use of the worldwide web.

CSI 1200 - Introduction to Computing and Programming using Excel (4)
An introduction to computers and programming. It introduces algorithms for applications that contain integrated development environments (IDE), such as Microsoft Excel's IDE for Visual Basic for Applications (VBA). Algorithmic topics include repetitive and decision structures, functions, subroutines, and ActiveX controls. Programming topics include application automation and presenting information programmatically. Laboratory. *Satisfies the university general education requirement in the formal reasoning knowledge foundation area.*

CSI 1220 - Computer Animation (4)

Computer animation is an increasingly critical component of human-computer-interaction, computer games, movie industry, and scientific and engineering visualization. This course covers the fundamental concepts underlying animation, discusses the characteristics and constraints of the different techniques and how they fit together, and teaches students the skills to create animations and computer games. This course is lab-intensive. Offered fall, winter. *Satisfies the university general education requirement in the formal reasoning knowledge foundation area.*

CSI 1300 - Introduction to Computer Programming (4)
Introduction to digital computers and algorithmic programming. Topics include: data storage and manipulation control structures, functions and sub-programming. Introduction to object oriented programming. Students cannot receive credit for CSI 1300 and EGR 1400. Offered fall, winter. *Satisfies the university general education requirement in the formal reasoning knowledge foundation area.*
Prerequisite(s): MTH 0662 or equivalent.

CSI 1310 - Computer Programming (4)
Algorithmic programming using a high level, event-driven, language such as VB.NET. Topics include data storage and manipulation, graphical user interfaces, control structures, functions and sub procedures. Students cannot receive credit for either EGR 1400 or CSI 1300. Offered fall, winter. Intended for Information Technology majors and minors.
Prerequisite(s): MTH 0662

CSI 1420 - Introduction to C Programming and Unix (4)
Introduction to programming and problem solving using C and Unix. The topics include fundamentals of C programming and basic Unix commands including file organization, user commands, and utilities in Unix and creating, editing, executing, and debugging C programs. Introduction to shell programming.
Pre/Corequisite(s): MTH 1554 or equivalent.

CSI 2290 - Introduction to Data Structures in C (4)
C programming including arrays, structures, and pointers. Basic data structures such as stacks, queues, and lists. Implementation and analysis of fundamental sorting and searching algorithms.
Prerequisite(s): EGR 1400

CSI 2300 - Object-Oriented Computing (4)
Introduction to object-oriented computer programming using a high-level programming language such as Java. Classes, member functions, inheritance, polymorphism and operator

overloading. Design methodologies and introduction to software engineering principles and practices. Basic data structures, algorithms and event driven programming concepts are introduced. With laboratory.
Prerequisite(s): EGR 1400 or CSI 1300 or CSI 1310 or CSI 1420 or equivalent.

CSI 2310 - Data Structures (4)
This course covers data structures using object oriented programming. The fundamental data structures in computer science, including stacks, queues, lists and trees are covered in detail. Concepts of design, analysis and verification are discussed in the context of abstract data types. Examples of applications taken from numeric and symbolic domains are used. With laboratory.
Prerequisite(s): CSI 2300

CSI 2320 - C++ for Programmers (2)
A course in C++ programming for programmers with basic knowledge of data types and control structures in programming languages. Topics include pointers, memory management, classes, polymorphism, overloading, templates, input/output, parameter passing, multiple inheritance, standard template library, and philosophical differences in major object-oriented programming languages.
Prerequisite(s): CSI 2300 or equivalent.

CSI 2330 - Immersive Python (2)
This course introduces the fundamentals and applications of Python. The language fundamentals covered are statements, variables, comments, control structures, functions, modules, packages, and objects. The course also includes advanced concepts such as collections (Lists, Tuples and Dictionaries) with their practical use for Data Processing, Systems administration, and Web development applications.
Prerequisite(s): CSI 1300 or CSI 2300

CSI 2340 - Ruby for Web Developers (2)
This course introduces the dynamic programming language Ruby -- focusing on language fundamentals, debugging and external language binding techniques, and extremely popular web development framework Ruby on the Rail (ROR). The basic ROR topics include discussion of convention over configuration as used by ROR and RESTful web development with practical exercises.
Prerequisite(s): CSI 1300 or CSI 2300

CSI 2350 - Programming in Visual C# for .NET Technology (2)
This course covers C#.NET for programmers who already have the basic knowledge for object-oriented programming techniques. Topics include: Windows forms, Common Language Run

Time (CLR), assemblies, ADO.NET, XML, Web Services, Mobile and Embedded Development.
Prerequisite(s): CSI 2300

CSI 2360 - Embedded C Language (2)
Introduces concepts of C language programming for embedded system applications. Provides rigorous treatment of theory and embedded program practice. Topics covered include: Syntax, fixed and floating point arithmetic, flow control, functions, arrays, pointers, characters, strings, input/output, bit manipulation, data structure, preprocessor (define, pragma, etc.), Embedded C standards, DSP extensions for C.
Prerequisite(s): CSI 2300

CSI 2440 - Computer Systems (4)
Introduction to computer systems. Topics cover computer system components, including hardware components, storage devices, memory, graphics accelerators, device and communications interfaces, and CISC and RISC processors, operating systems, and system administration activities. Issues in cost, performance, security, and compatibility are also considered.
Prerequisite(s): CSI 2300 or equivalent.

CSI 2470 - Introduction to Computer Networks (4)
An introduction to fundamental concepts for design and analyses of computer networks. Topics covered include the physical layer, network protocols, Local Area Networks, Internet, wireless and mobile networks, network security, and socket programming.
Prerequisite(s): high level programming course or CSI 2300

CSI 2500 - Introduction to Operating Systems for System Administrators (4)
Introduces fundamental concepts of system administration for Unix and Windows operating systems. Concepts of operating system such as file system, memory management, processes and service management are discussed in view of System Administration. Script programming is introduced to automate system administration tasks.
Prerequisite(s): CSI 2440

CSI 2520 - Interactive Web Systems (4)
This course introduces the fundamentals of interactive multimedia in context of web technologies. Topics covered include use of modern web development tools, Markup Languages, server-side processing, and client-side processing using languages such as JavaScript. Students will use these tools to create interactive and dynamic web sites. *Satisfies the university general education requirement in the knowledge applications integration area. Prerequisite for knowledge applications integration: completion of the general education*

requirement in the formal reasoning knowledge foundation area.
Prerequisite(s): CSI 2300

CSI 2879 - Ethics and Social Impacts of Computing (2)
Ethical issues in computing and its social impacts are introduced. Topics include software piracy, hacking, privacy, professional conduct, and the impact of information technology on society.

CSI 2999 - Sophomore Project (2)
A team-oriented project work consisting of a small project to build skills in needs assessment, group problem solving, and written and oral technical presentations.
Prerequisite(s): CSI 2300

CSI 3350 - Programming Languages (4)
Fundamental concepts in programming languages. Several high-level languages are studied in depth and their approaches to the fundamental issues in language design are compared. Issues include: data types and structures, control structures, binding times, run-time storage organization, flexibility vs. efficiency, compiled vs. interpreted languages, strong vs. weak typing, block structure and scope of names. Offered fall.
Prerequisite(s): CSI 2310 and MTH 2775 and major standing.

CSI 3370 - Software Engineering and Practice (4)
Introduction to software engineering and practice. Topics include software process models, project management, requirements analysis, software quality assurance, and testing.
Prerequisite(s): major standing.

CSI 3430 - Theory of Computation (4)
Formal models of computation, ranging from finite state automata to Turing machines. Computational models are used to discuss the languages recognized by these machines and address issues of computability. Offered Winter. Identical with APM 3430.
Prerequisite(s): Major standing CS.

CSI 3450 - Database Design and Implementation (4)
Introduction to the design and implementation of database systems. Include designing a practical database for an application using normal forms, understanding relational database schemas, planning and implementing a database using software such as Oracle and Microsoft SQL Server, advanced database topics in redundancy, replication, load balancing, compatibility, ODBC and JDBC, and database systems administration.
Prerequisite(s): major standing in IT.

CSI 3500 - Human Computer Interaction (4)
Surveys various components, techniques of Human Computer Interaction (HCI). Topics include the basic perceptual, cognitive and performance capabilities of people and external factors that affect these capabilities, tools, techniques for understanding, predicting, evaluating the interactions of people with technology. Systematic processes for designing, evaluating and revising interactive systems are studied.
Prerequisite(s): major standing in IT/CS.

CSI 3520 - Systems Analysis (4)
Introduction to pervasive themes in information technology. Topics include history of information systems, information management, complexity management, methodologies for information centric requirements analysis, work flow analysis, and tools for system analysis.
Prerequisite(s): major standing in IT.

CSI 3610 - Design and Analysis of Algorithm (4)
Computer algorithms, their design and analysis. Strategies constructing algorithmic solutions, including divide-and- conquer, dynamic programming and greedy algorithms. Development of algorithms for parallel and distributed architectures. Computational complexity as it pertains to time and space is used to evaluate the algorithms. A general overview of complexity classes is given. Offered fall and winter. Identical with APM 3610.
Prerequisite(s): CSI 2310, APM 2663, and major standing in CS.

CSI 3640 - Computer Organization (4)
Assembly language, addressing modes, RISC and CISC architectures, assemblers, loaders, linkers arithmetic and logic unit, hardware functional units, input/output organization, memory organization, cache memory, virtual memory, control unit, pipelining, parallel computer organization.
Prerequisite(s): EGR 2400 and major standing in CS.

CSI 3660 - System Administration (4)
This course teaches the skills necessary to analyze, deploy, manage and troubleshoot enterprise computing infrastructures. Topics include user authentication management, system configuration and management, periodic tasks automation, network file systems and data backup techniques, server deployments, and system performance analysis techniques. The course has a significant lab component.
Prerequisite(s): CSI 2470 and major standing in CS/IT.

CSI 3670 - Advanced System Administration (4)

Advanced concepts in enterprise computing infrastructure analysis, deployment, management and troubleshooting. Topics include enterprise computing resource requirements analysis and design, single sign-on management, application and server deployment, virtualization, security configurations, and performance analysis.
Prerequisite(s): CSI 3660 and major standing in CS/IT.

CSI 3680 - Script Programming (4)
This course provides an in-depth coverage of Python and Unix shell programming to quickly automate various repetitive and complex tasks including those that are used in system administration. The course builds on a good grasp of Unix systems and a solid foundation in high-level programming.
Prerequisite(s): CSI 3660

CSI 3710 - Computer Hardware Design (4)
Development of components and techniques needed to design basic digital circuits and systems for computers, communication and related applications. Design and analysis of combinational and sequential logic circuits using a hardware description language such as VHDL. Design of a small digital computer and its implementation in an FPGA. Identical with ECE 3710.
Prerequisite(s): EGR 2400 and major standing in CS.

CSI 4230 - Mobile Smart Phone Application Development (4)
This course focuses on simple to advanced mobile application development for smartphone devices. Both classroom theory and hands-on labs enable students to gain experience in developing real-world mobile applications. Topics include mobile user interface development, mobile hardware resource accessibility API, networking and persistent storage.
Prerequisite(s): CSI 2300

CSI 4240 - Cloud Computing (4)
The course explores latest advances in hardware and software, system architecture, and new programming paradigms that are used to develop high-throughput distributed computer systems. Topics covered include computer clusters, virtual machines, automated data centers, cloud platform architectures, service-oriented architectures, cloud programming and software environments, grid computing, and peer-to-peer computing. The course will be supplemented by selected topics from recent technical literature.
Prerequisite(s): Senior standing.

CSI 4360 - Concurrent and Multi-Core Programming (4)
This course will focus on concepts, theory, design, and implementation of concurrent programs for multi-core computers, multi-core programming methodologies. Topics covered include

mutual exclusion, memory model and thread-based parallelism, fork-join framework, locks, parallel control flow, concurrent data structures.
Prerequisite(s): Senior standing.

CSI 4410 - CIT Project Management (4)
This course presents the theory and practice of IT project management. Topics include financial modeling, cost and effort estimation, project risk management, and project evaluation and selection as well as topics in IT project sponsorship, stewardship and leadership. IT entrepreneurship and marketing are emphasized throughout the course.
Prerequisite(s): CSI 3520 and major standing in IT.

CSI 4480 - Information Security Practice (4)
Survey of concepts and methods of security policies, models and mechanisms for secrecy, integrity, availability, and authentication. Topics covered include security policies; access control; introduction to cryptography; control and prevention of viruses and other rogue programs; common system vulnerabilities and countermeasures; and legal and social issues.
Prerequisite(s): CSI 2470 and major standing in CS/IT.

CSI 4500 - Fundamentals of Operating Systems (4)
Introduction to the concepts and design of operating systems. Typical topics include: sequential processes, concurrent processes, processor management, memory management, scheduling, file management, and resource protection. Offered winter.
Prerequisite(s): CSI 3610 and CSI 3640 and major standing in CS or CE.

CSI 4720 - Microprocessor-Based System Design (4)
Application of microprocessors and microcomputers to the solution of typical problems; interfacing microprocessors with external system such as sensors, displays and keyboards; programming considerations, microcomputer system and memory system design. A laboratory, design course; several short design projects and one large design project. Written report and oral presentation required. Credit cannot be earned for both CSI 4720 and ECE 4720. Identical with ECE 4720. Offered fall, winter.
Prerequisite(s): CSI 3640 and major standing.

CSI 4780 - Bioinformatics (4)
This course covers the fundamental algorithms and computational methods for study of biological sequence data for comparative biology and evolution with the focus on discovery of genome content, function and organization. Specific methodologies covered include the algorithms for searching sequence databases, pair-wise and multiple sequence alignment, phylogenetic methods, and methods for pattern recognition and functional inference from

sequence data.
Prerequisite(s): major standing.

CSI 4900 - Special Topics (2 TO 4)
Advanced study of special topics. May be taken more than once.
Prerequisite(s): major standing.

CSI 4950 - Internship (4)
The student works on a specific project at a corporate site with the prior approval by the program director. Oral and written presentations about the project are required.
Prerequisite(s): major standing

CSI 4955 - Industrial Project (4)
The student works on a specific project at a corporate site with the prior approval by the program director. Oral and written presentations about the project are required.
Prerequisite(s): major standing.

CSI 4995 - Undergraduate Research (4)
The student performs research under the supervision of a faculty member. Prior permission required. Oral and written presentations about the research are required.
Prerequisite(s): major standing.

CSI 4996 - Independent Study (2 TO 4)
Advanced individual study in a special area. Topic must be approved prior to registration. May be taken more than once.
Prerequisite(s): major standing.

CSI 4998 - Senior Project (2 TO 4)
Independent work on advanced laboratory projects. Topics must be approved prior to registration. May be taken more than once.
Prerequisite(s): major standing.

CSI 4999 - Senior Capstone Project (4)
A team-oriented senior project to synthesize the knowledge and skills gained in the CS/IT curricula. Written and oral reports are required in addition to a working demo. *Satisfies the university general education requirement for the capstone experience. Satisfies the university general education requirement for a writing intensive course in the major. Prerequisite for writing intensive: completion of the university writing foundation requirement.*

Prerequisite(s): CSI 3370, CSI 3450, CSI 3500 or CSI 3520 or CSI 3640, major standing and senior standing.

EGR 1200 - Engineering Graphics and CAD (1)
An introduction to the techniques for creating solid models of engineering designs. Topics include three-dimensional modeling of parts and assemblies, visualization, orthographic project views and layouts, auxiliary, sectional, and cutout views, exploded views, dimensioning and tolerancing, bill of materials, and computer-generated design documentation. Offered fall and winter.
Pre/Corequisite(s): MTH 1441 or placement.

EGR 1400 - Computer Problem Solving in Engineering and Computer Science (4)
General methods of problem solving and principles of algorithmic design using a high-level language such as Visual Basic.NET. Introduction to MATLAB. Applications will be drawn from problems in mechanical, electrical and computer engineering and computer science. Offered fall, winter.
Corequisite(s): MTH 1554 or equivalent.

EGR 2400 - Introduction to Electrical and Computer Engineering (4)
An introduction to the fundamentals of electrical and computer engineering; DC and AC circuits, digital logic circuits; combinational logic design; sequential circuits, introduction to electronics, operational amplifiers, DC electromechanical machines. With laboratory. Offered fall, winter. *Satisfies the university general education requirement in the natural science and technology knowledge exploration area.*
Prerequisite(s): CSI 1420 or EGR 1400
Pre/Corequisite(s): MTH 1555 and PHY 1510 and PHY 1100 or PHY 1610

EGR 2500 - Introduction to Thermal Engineering (4)
Introduction to the fundamentals of classical thermodynamics and heat transfer; first and second laws of thermodynamics; thermodynamic property relationships; application to engineering systems and processes; introduction to conduction, convection and radiation; steady 1-D conduction and extended surfaces; lumped capacitance method. Offered fall and winter. *Satisfies the university general education requirement in the natural science and technology knowledge exploration area.*
Prerequisite(s): CHM 1430 or CHM 1440, PHY 1610 or PHY 1510, and EGR 1400
Pre/Corequisite(s): APM 2555

EGR 2600 - Introduction to Industrial and Systems Engineering (4)

Overview of industrial and systems engineering: perspectives, tools and models. In depth coverage of probability and statistics in engineering: density and distribution functions, population and sampling distributions, confidence intervals, hypothesis testing and introduction to discrete-event simulation. Offered fall, winter.
Prerequisite(s): MTH 1555

EGR 2800 - Design and Analysis of Electromechanical Systems (4)
Design, analysis, and testing of electromechanical systems; statics, linear and rotational dynamics; introduction to microprocessors; team design project dealing with technical, economic, safety, environmental, and social aspects of a real-world engineering problem; written, oral, and visual communication, engineering ethics. With Laboratory. Offered fall and winter.
Prerequisite(s): EGR 1200, EGR 2400, APM 2555
Pre/Corequisite(s): EGR 2500, EGR 2600

EGR 2905 - Special Topics (1 TO 4)
Study of special topics in engineering and/or computer science. May be taken more than once. Topic must be approved prior to registration.

EGR 4010 - Professional Engineering (1)
Seminars of professional interest to engineers, including such topics as professionalism, ethics, engineering law, engineering economics and technical communications.
Prerequisite(s): major standing.

EGR 4910 - International Engineering and Computer Science (4)
An independent study or technical internship involving a minimum of eight weeks of residence abroad; student is required to present a final report. Departmental approval is required prior to registration.
Prerequisite(s): senior standing.

EGR 4970 - Engineering Seminar (1)
Lectures and discussions conducted by faculty, graduate students and speakers from industry and other universities. Emphasis is on current research interests of the school. May be taken twice.

EGR 4999 - Capstone Design (3 TO 4)
Multi-disciplinary team experience in design, emphasizing realistic constraints such as safety, economic factors, reliability, aesthetics, ethics and societal impact. Projects will be supervised

by the faculty. Offered fall, winter.
Prerequisite(s): senior standing.

Department of Electrical and Computer Engineering

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446 ENGINEERING CENTER

(248) 370-2177

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Chairperson: *Daniel N. Aloi*

Professors emeriti: *Richard E. Haskell, Naim A. Kheir, Keith R. Kleckner, Nan K. Loh, Tung H. Weng, Howard R. Witt*

Professors: *Hoda S. Abdel-Aty-Zohdy, Daniel N. Aloi, Ka C. Cheok, Manohar Das, Subramaniam Ganesan, Edward Y.L. Gu, Darrin Hanna, Andrzej Rusek, Mohamed A. Zohdy*

Associate professors: *Jia Li, Hongwei Qu, Osamah Rawashdeh, Jing Tang*

Assistant professors: *Shadi Alawneh, Seyed Ali Arefifar, Brian Dean, Daniel Llamocca, Wing-Yue Geoffrey Louie*

Special Instructor: *Khalid Mirza, Michel Sultan*

Adjunct professor: *Mutasim Salman, Housein Dourra*

Adjunct associate professor: *Anson Lee*

Adjunct assistant professor: *Randy Graca, Micho Radovnikovich*

Advisory Board

The Electrical and Computer Engineering External Advisory and Development Board assists the department in enhancing its educational and research programs and ensuring their relevance to current and emerging technological needs.

Board members are:

Dona Burkard, Research and Innovation Center - Project Manager, Ford Motor Company

Anthony D. Cooprider, Ph.D., Senior Technical Leader, Global EE Systems, Ford Motor Company

Housein Dourra, Ph.D., Senior Technical Fellow, Fiat Chrysler Automobiles

Byron Gillespie, Director, Intel Corporation

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Greg Hudas, Ph.D., Program Manager, US Army RDECOM-TARDEC

John Schneider, Chief Engineer, Ford Motor Company

Chris Van Dan Elzen, Vice President, Autoliv

Paul VanOphem, President, CSM Products, Inc.

General Information

The Department of Electrical and Computer Engineering carries out the mission of the School of Engineering and Computer Science by offering separate undergraduate majors in Electrical Engineering and Computer Engineering. The department also offers masters programs in Electrical and Computer Engineering, Mechatronics Systems Engineering, and Embedded Systems, as well as a Ph.D. program in Electrical and Computer Engineering. The undergraduate programs in the Department of Electrical and Computer Engineering are accredited by the Computing Accreditation Commission of the Accreditation Board of Engineering and Technology (ABET).

Schedule of classes

Specific offerings for each semester may be found in the Schedule of Classes.

Programs

- Computer Engineering, B.S.E.
- Electrical Engineering, B.S.E.

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 (excluding math and science) - 28 credits

- Students are required to take PHL 1310 to satisfy the general education requirement in Western Civilization.

- To satisfy the General Education Requirement in Social Science, computer engineering students are required to take one of the following economics courses: ECN 1500, ECN 2010, ECN 2020, or ECN 2100.
- 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 -- 32 credits

- 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)** (or [CHM 1440 **(4)** and CHM 1470 **(1)**])
- PHY 1610 - Fundamentals of Physics I **(4)** *
- PHY 1620 - Fundamentals of Physics II **(4)** *

Select one course from the list below

- 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)**
- 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)**
- MTH 2554 - Multivariable Calculus **(4)**
- MTH 2775 - Linear Algebra **(4)**
- MTH 3552 - Complex Variables **(4)**
- *Or others by approval by petition to the SECS Committee on Academic Standing.*

Note

*Neither PHY 1610 nor PHY 1620 satisfies the university general education requirement in the natural science and technology knowledge exploration area. Credit for both PHY 1510 and PHY 1610 is not permitted, and credit for both PHY 1520 and PHY 1620 is not permitted.

Engineering core -- 21 credits

- 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 -- 36 credits

- CSI 2290 - Introduction to Data Structures in C **(4)**
- CSI 3640 - Computer Organization **(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 3710 - Computer Hardware Design **(4)**
- ECE 4720 - Microprocessors-based Systems Design **(4)**
- ECE 4999 - Senior Design **(4)**

Professional electives - 12 credits

Professional elective courses can be selected from 3000, 4000, or 5000 level engineering courses, computer science and informatics courses, concentrations (see below), or approved mathematics and science electives; excluding co-ops/internships. Professional electives at the 5000 level require an overall GPA of 3.0 (B) or above. Of the 12 professional elective credits, at least 4 must be from a 4000 or 5000 level course. Prior approval of the chairperson of the Department of Electrical and Computer Engineering is required for ECE 4996 and ECE 4998. Suggested concentration sets of courses are provided below:

1. Communication and networking

- ECE 3300 - Electromagnetics I **(4)**
- ECE 4210 - Communication Systems **(4)**
- ECE 4310 - Antennas **(4)**
- ECE 4230 - Satellite-based Positioning System **(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 3450 - Database Design and Implementation **(4)**
- CSI 3610 - Design and Analysis of Algorithm **(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. Forms may be obtained from the SECS Undergraduate advising office or from the SECS website.

To gain major standing in Computer Engineering, students must:

A) have an average of at least 2.0 (C) in the following mathematics and science courses: MTH 1554, MTH 1555, APM 2555, CHM 1430 (or CHM 1440 and CHM 1470), PHY 1610 (or PHY 1510 and PHY 1100), and PHY 1620 (or PHY 1520 and PHY 1110)

B) have an average of at least 2.0 (C) 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. Students may petition to repeat a course a fourth time; and

E) have not repeated more than three different courses. 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 an average grade of at least 2.0 (C) within each course group: namely, mathematics and sciences, engineering core, and professional subjects (required and elective). Within professional subjects, at most two grades below C are permitted; at most two different courses may be repeated, and a total of three repeat attempts 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

- EGR 1200 - Engineering Graphics and CAD **(1)**
- MTH 1554 - Calculus I **(4)**
- EGR 1400 - Computer Problem Solving in Engineering and Computer Science **(4)**
- CHM 1430 - Chemical Principles **(4)**
- **WRT or General education**

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

- EGR 2500 - Introduction to Thermal Engineering **(4)**
- ECE 2700 - Digital Logic Design **(4)**
- APM 2555 - Introduction to Differential Equations with Matrix Algebra **(4)**
- PHY 1620 - Fundamentals of Physics II **(4)**

Winter semester -- 16 credits

- ECE 2005 - Electric Circuits **(4)**
- EGR 2600 - Introduction to Industrial and Systems Engineering **(4)**
- EGR 2800 - Design and Analysis of Electromechanical Systems **(4)**
- **General education**

Junior year

Fall semester -- 16 credits

- CSI 2290 - Introduction to Data Structures in C **(4)**
- ECE 3100 - Electronic Circuits and Devices I **(4)**
- ECE 3710 - Computer Hardware Design **(4)**
- **General education (4)**

Winter semester -- 16 credits

- APM 2663 - Discrete Mathematics **(4)**
- CSI 3640 - Computer Organization **(4)**
- ECE 4720 - Microprocessors-based Systems Design **(4)**
- **General education (4)**

Senior year

Fall semester -- 16 credits

- ECE 3204 - Signals and Systems **(4)**

- **Professional elective (4)**
- **Professional elective (4)**
- **General education (4)**

Winter semester -- 16 credits

- ECE 4999 - Senior Design **(4)**
- **Professional elective (4)**
- **General education (4)**
- **Approved math or science 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 (excluding math and science) -- 28 credits

- Students are required to take PHL 1310 - Introduction to Ethics in Science and Engineering to satisfy the General Education Requirements in Western Civilization.
- To satisfy the General Education Requirement in Social Science, electrical engineering students are required to take one of the following economics courses: ECN 1500, ECN 2010, ECN 2020, or ECN 2100.
- 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 -- 32 credits

- 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 **(4)** and CHM 1470 **(1)**]
- PHY 1610 - Fundamentals of Physics I **(4)**
- PHY 1620 - Fundamentals of Physics II **(4)**

Select one course from the list below.

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 a specific 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)**
- 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)**
- MTH 3552 - Complex Variables **(4)**

- *or others by approval by petition to the SECS Committee on Academic Standing.*

Note

*Neither PHY 1610 nor PHY 1620 satisfies the university general education requirement in the natural science and technology knowledge exploration area. Credit for both PHY 1510 and PHY 1610 is not permitted, and credit for both PHY 1520 and PHY 1620 is not permitted.

Engineering core -- 21 credits

- 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 -- 32 credits

- 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 3300 - Electromagnetics I **(4)**
- ECE 3600 - Electrical Machines **(4)**
- ECE 3105 - Electronic Circuits and Devices II **(4)**
- ECE 4999 - Senior Design **(4)**

Professional electives -- 16

Electrical engineering students must select two (2) professional depth areas. In one depth area, students are required to take the key course and one of the two listed professional electives. In

the other depth area, students are only required to take the key course. In addition, students must select one (1) free elective from any 4000 level ECE course. Students with an overall GPA of 3.0 (B) or greater may select, as their free 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 4720 - Microprocessors-based Systems Design **(4)**

Electives:

- CSI 3640 - Computer Organization **(4)**
- ECE 3710 - Computer Hardware Design **(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. Industrial Robotics

Key course:

- ECE 4500 - Robotic Systems and Control **(4)**

Electives:

- ECE 4510 - Machine Vision **(4)**
- ECE 4520 - Automotive Mechatronics I **(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 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.

To gain major standing Information Technology, students must:

A) have an average of at least 2.0 (C) in the following mathematics and science courses: MTH 1554, MTH 1555, APM 2555, CHM 1430 (or CHM 1440 and CHM 1470), PHY 1610 (or PHY 1510 and PHY 1100), and PHY 1620 (or PHY 1520 and PHY 1110)

B) have an average of at least 2.0 (C) 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. Students may petition to repeat a course a fourth time; and

E) have not repeated more than three different courses. 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 an average grade of at least 2.0 (C) within each course group: namely, mathematics and sciences, engineering core, and professional subjects (required and elective). Within professional subjects, at most two grades below C are permitted; at most two different courses may be repeated, and a total of three repeat attempts 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

- EGR 1200 - Engineering Graphics and CAD **(1)**
- MTH 1554 - Calculus I **(4)**
- EGR 1400 - Computer Problem Solving in Engineering and Computer Science **(4)**
- CHM 1430 - Chemical Principles **(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

- ECE 2005 - Electric Circuits **(4)**
- APM 2555 - Introduction to Differential Equations with Matrix Algebra **(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

- MTH 2554 - Multivariable Calculus **(4)**
- ECE 3100 - Electronic Circuits and Devices I **(4)**
- ECE 3204 - Signals and Systems **(4)**
- General education **(4)**

Winter semester -- 16 credits

- ECE 3105 - Electronic Circuits and Devices II **(4)**
- ECE 3300 - Electromagnetics I **(4)**
- ECE 3600 - Electrical Machines **(4)**
- ECE 2700 - Digital Logic Design **(4)**

Senior year

Fall semester -- 16 credits

- Approved math/science elective **(4)**
- Key course-area 1 **(4)**
- Key course-area 2 **(4)**
- General education **(4)**

Winter semester -- 16 credits

- General education **(4)**
- Elective-area 1 **(4)**
- ECE free elective
- ECE 4999 - Senior Design **(4)**

Courses

ECE 2005 - Electric Circuits (4)
Modeling and analysis of circuits with dependent sources; non-ideal operational amplifiers. Transient and forced responses in RC, RL and RLC circuits. Series and parallel resonant circuits. AC power, three-phase circuits, magnetically coupled circuits. Wye-delta transforms. Introduction to frequency response. Use of PSPICE. With laboratory. Offered fall and winter.
Prerequisite(s): EGR 2400
Pre/Corequisite(s): APM 2555

ECE 2700 - Digital Logic Design (4)
Boolean algebra; number systems and arithmetic, combinational logic circuits; synchronous sequential circuits; asynchronous sequential circuits; introduction to a hardware description language (HDL). With laboratory.
Prerequisite(s): EGR 2400

ECE 3100 - Electronic Circuits and Devices I (4)
Characteristics and models of nonlinear circuit elements, such as diodes, BJTs and MOSFETs. Analysis and design of circuits employing these devices, including power supplies, voltage regulators, and amplifiers; Biasing and circuit stability issues. Use of Operational amplifiers, discrete circuit elements; and PSPICE software for circuit design is emphasized in the lab. With Laboratory. Offered fall, winter.
Prerequisite(s): ECE 2005 and major standing.

ECE 3105 - Electronic Circuits and Devices II (4)
Analysis and design of functional analog circuits with particular specifications. Frequency responses of analog circuits. Building blocks for integrated circuits including current mirror, differential pairs and output stage. Active filters. Interface circuits for micro-electro-mechanical systems (MEMS) and sensors. A laboratory session is integrated to enhance students' experience in circuit design and analysis.
Prerequisite(s): ECE 3100

ECE 3204 - Signals and Systems (4)
Basic signals, average value, average power, and energy. Laplace transform and inverse Laplace transform, and transfer function concept and approach in the analysis of electrical and mechanical lumped-parameter linear systems. Systems modeling and analysis in Laplace and differential equation domains. Natural and forced responses of linear time-invariant systems, and concept of convolution. Fourier analysis of signals and systems: Fourier series and Fourier transform, power spectral density, energy spectral density, band width, and filters.
Prerequisite(s): ECE 2005 and major standing.

ECE 3300 - Electromagnetics I (4)
This is an introductory course in electromagnetics. A thorough review of waves, phasors, and vector calculus is provided to lay the mathematical foundation to cover the key topics in this course. The key topics include transmission lines, electrostatics, magnetostatics, and touches upon time-varying fields.
Prerequisite(s): ECE 2005, MTH 2554, and major standing.

ECE 3600 - Electrical Machines (4)
Magnetic circuits, transformers, magnetic energy, force/torque and heat dissipation. DC and AC machines and their equivalent circuits, torque analysis and power efficiency. Three phase transformers, synchronous and induction machines. Per unit system and introduction to power distribution. With Laboratories in transformers, DC and AC machines.
Prerequisite(s): ECE 2005 and major standing.

ECE 3710 - Computer Hardware Design (4)
Development of components and techniques needed to design digital circuits and systems for controllers, computers, communication and related applications. Design and analysis of combinational and sequential logic circuits using a hardware description language such as VHDL, timing simulations, test benches, embedded cores. Design of special-purpose processors and their implementation in an FPGA. With Laboratory. Offered fall, winter, summer. Identical with CSI 3710.
Prerequisite(s): EGR 2400 or ECE 2700 and major standing.

ECE 4110 - Automotive Electronics (4)
Review of basic automotive electronic devices and circuits. Characteristics, models and interfacing of sensors and actuators. Basic electronic and electromechanical controllers; engines, transmission, brake, suspension and traction. Battery system supply. Ancillary system components: safety, auto, theft, diagnostics, collision. With laboratory. (Not for credit for electrical engineering majors).
Prerequisite(s): major standing.

ECE 4120 - Industrial Electronics (4)
Applications of advanced electronics to manufacturing processes. Analysis and design considerations for industrial electronic systems. Operation of programmable controllers. Modeling and characteristics of integrated process elements. Transducers, signal conditioning and transmission; analog and digital controllers; thyristor commutation techniques; power supplies and interfaces, DC and AC drives and motor control circuits. With laboratory and design projects.
Prerequisite(s): ECE 3100 and major standing.

ECE 4130 - Electronic Materials and Devices (4)
Semiconductor materials and device physics; charge carriers and conduction mechanisms, Energy Band Diagrams (EBDs). Theory of metal-semiconductor contacts and junction diodes. Unipolar and bipolar devices: MOSFETs threshold voltage, characteristics, circuit models and regions of operations; bipolar junction transistors, and introduction to CMOS with integrated circuit technology, layout and simulation.
Pre/Corequisite(s): ECE 3100

ECE 4132 - VLSIC Design of Digital Chips (4)
CMOS Very Large Scale Integrated Circuits design methodology for rapid implementation and evaluation. From digital systems level to circuit, device, and processing layout. Combinational and sequential circuit characterization and performance estimation. Inverters, logic, and transmission gates switching characteristics. Reliability and yield. Application Specific ICs design projects using professional CAD tool-suites. With laboratory.
Prerequisite(s): ECE 3100 and ECE 2700 or ECE 3710

ECE 4135 - Integrated Electronics (4)
Modern microelectronics processes and fabrication of integrated circuits. Crystal growth, wafer preparation, photo lithography, dielectric and polysilicon film deposition, epitaxial growth, oxidation, diffusion, ion implementation, etching, metallization and integrated circuits layout principles. Introduction to MOS-based and bipolar transistor-based microcircuits design and fabrication. Fabrication processing simulation using SUPREM. With laboratory and projects.
Prerequisite(s): ECE 4130

ECE 4210 - Communication Systems (4)
Review of Fourier series, Fourier transform, and signal characteristics, such as bandwidth, power, energy, power spectral density, and orthogonality. Introduction to basic modules in communication systems and their functions. Analog and digital modulation and demodulation techniques, including amplitude, frequency, phase modulation and demodulation, and phase locked loop. Sampling and quantization. Review of probability theory. Introduction to performance analysis of modulated communication systems under noise. Introduction to technological advances and applications in modern communications. With laboratory.
Prerequisite(s): ECE 3100 and ECE 3204

ECE 4220 - Fundamentals of Digital Signal Processing (4)
Basic analysis and design of linear time-invariant discrete-time systems. Properties of digital signals and systems, Z-transform and discrete Fourier transform, spectrum analysis and digital filter design.
Prerequisite(s): ECE 3204

ECE 4230 - Satellite-based Positioning System (4)
Introduction to satellite-based positioning systems with emphasis on Global Positioning System (GPS), GPS satellite constellation, coordinate systems, timing standards, GPS signal structure. Determination of position from range measurements. Ranging error sources and mitigation techniques. Impact of ranging errors and satellite geometry on 3-dimensional position error.
Prerequisite(s): ECE 4210

ECE 4305 - Electromagnetics II (4)
This course provides an introduction to radio wave propagation, antennas and communications systems. Students will learn plane wave propagation through uniform and isotropic media, wave reflection and transmission at normal incidence, complex propagation constant, wave polarization, wave impedance, Poynting vector, basic radiation and antenna principles and satellite communications systems and radar sensors. Course includes laboratories.
Prerequisite(s): ECE 3300

ECE 4310 - Antennas (4)
This course provides an introduction to antenna performance parameters including field patterns, power patterns, beam area, directivity, gain, beam efficiency, radiation intensity, antenna apertures, impedance, polarization, and the radio communication links. Dyadic Green's function, radiation from current elements such as dipoles and monopoles, far-zone fields and arrays of point sources. Course incorporates lab demonstrations.
Prerequisite(s): ECE 3300

ECE 4320 - Electromagnetic Compatibility (4)
Review of fundamental behavior of circuit and systems. Non-ideal models of circuit components. Signals and their spectra. EMC regulations. Conducted and radiated emissions and immunity. EMC tests and instrumentation. Analysis of shielding and grounding solutions. Introduction to signal integrity and EMC issues in transmission lines.
Prerequisite(s): ECE 3300

ECE 4400 - Automatic Control Systems (4)
Mathematical modeling of dynamic systems, transfer functions and block diagrams. State-space representations and local linearization of nonlinear systems. Transient and steady-state analysis, stability criteria and state-feedback control. The root-locus method and frequency-response method for control systems analysis and design. Design of PID controllers and compensation networks. Controllability and observability for linear time invariant system2. Computer simulations using Matlab. With laboratory.
Prerequisite(s): ECE 3204

ECE 4410 - Digital Control Systems (4)
Sampling theorem, digitization and discrete-time models of a continuous control system. Introduction to z-transform, transfer function and stability criteria in z-plane. Digital control system analysis and design using root-locus and frequency-response methods. State-space models and local linearization of nonlinear discrete-time systems. Controllability, observability, and state-feedback control of a linear discrete system. Implementation aspects of computer-controlled systems. Use of Matlab and Simulink for design and simulation of digital control systems.
Prerequisite(s): ECE 4400

ECE 4415 - Microcomputer-based Control Systems (4)
Computer-aided engineering, modeling, analysis, design, evaluation and visualization of dynamical and control systems including algorithms for digital logic, filters, controllers and estimators. Microcomputer-based hardware/software implementation of algorithms including data acquisition, signal conditioning and power processing circuits, computer interface and data communications, input and output devices, graphics displays. Model-based rapid prototyping of embedded microcontrollers and PIC processors. Experiments and projects emphasize real-time applications, programming and hardware integration. With laboratory.
Prerequisite(s): ECE 3105 and ECE 4400

ECE 4500 - Robotic Systems and Control (4)
Introduction to robotic systems and applications. Robotic forward and inverse kinematics. Task and path planning with motion controls. Jacobian matrix, differential motion and robotic statics. Redundant robots, mobile robots and multi-robot coordination. Robotic dynamics, position control and force control. Computer simulation and laboratory demonstration. Offered fall or winter.
Prerequisite(s): ECE 3204 and major standing.

ECE 4510 - Machine Vision (4)
Introduction to machine vision; image formation (impacts of lighting and optics); image processing; feature detection and matching; feature-based alignment. Industrial applications for machine vision; gauging; inspection; guidance; identification. Laboratory based projects.
Prerequisite(s): ECE 3204

ECE 4520 - Automotive Mechatronics I (4)
Overview of mechatronics, modeling, simulation, characterization and model validation of electromechanical devices; introduction to computer-aided software; basic automotive sensors; basic actuators and power train devices; principles of automotive and industrial electronic circuits and control systems (analog and digital); principles of produce design; mechatronics

case studies. With laboratory.
Prerequisite(s): ECE 2005, ECE 3204 and major standing.

ECE 4605 - Electromechanical Energy Conversion II (4)
Advanced study of electromagnetic systems. The principle of duality between magnetic and electric circuits. Necessary conditions for electromechanical energy conversion. Modeling, equivalent circuits and steady-state/transient analyses of DC and AC electric machines. Speed control of DC and AC motors with industrial applications. With laboratories.
Prerequisite(s): ECE 3600 and major standing.

ECE 4610 - Introduction to Power Electronics (4)
Power semiconductor devices and circuits. AC/DC Converters. Thyristors and communication techniques. Phase-controlled rectifiers, choppers and inverters. AC voltage controllers and cycloconverters. Introduction to novel power electronic devices, such as IGBT and power MOSFET. Some industrial applications. With laboratory.
Prerequisite(s): ECE 3100 and ECE 3204

ECE 4620 - Electrical Energy Systems (4)
Generation, transmission and distribution of electrical energy. Analysis and design of three-phase circuits, representation of power systems and per unit normalization, symmetrical components and stability, unsymmetrical faults. Computer-aided problem solving included.
Prerequisite(s): ECE 3204 and ECE 3600

ECE 4630 - Electric and Hybrid Drive Systems (4)
Introduction to electric drives and their applications including mobile robots, electric vehicles, plug-in EV and hybrid EV. Brush and brushless DC, AC synchronous and induction, stepper motors. Load torque-speed-current profile, losses. Power processing units, dc-dc converters, H-bridges, 3-phase inverters. Clarke and Park transform, field oriented control, pulse width modulation and space vector modulation. Torque, speed and position control synthesis and analysis. Battery types, state-of-charge models, heat issues. Regenerative braking, alternative energy. Computer simulation and visualization of principles.
Prerequisite(s): ECE 3600, ECE 4400 and ECE 4610

ECE 4720 - Microprocessors-based Systems Design (4)
Application of microprocessors and microcomputers to the solution of typical problems, interfacing microprocessors with external systems such as sensors, displays and keyboards; programming considerations, microcomputer system and memory system design. A laboratory, design course; several short design projects and one large design project. Written report and oral presentation required. Credit cannot be earned for both CSI 4720 and ECE 4720. Offered

fall, winter.
Prerequisite(s): ECE 2700 or ECE 3710, and major standing.

ECE 4900 - Special Topics (2 TO 4)
Advanced study of special topics in engineering. May be taken more than once.
Prerequisite(s): major standing.

ECE 4996 - Independent Study (2 TO 4)
Advanced individual study in a special area. Topic must be approved prior to registration. May be taken more than once.
Prerequisite(s): major standing.

ECE 4998 - Senior Project (2 TO 4)
Independent work on advanced laboratory projects. Topic must be approved prior to registration. May be taken more than once.
Prerequisite(s): major standing.

ECE 4999 - Senior Design (4)
Capstone design projects selected from a wide variety of areas related to electrical and computer engineering. Develops system approach to design: preparation of specifications, scheduling, modeling, simulations, and technological, financial and environmental aspects. Multi-disciplinary teamwork is emphasized. Prototyping, testing and completion of the project are required. Presentation of results required. *Satisfies the university general education requirement for a capstone experience. Satisfies the university general education requirement for a writing intensive course in the major. Prerequisite for writing intensive: completion of the university writing foundation requirement.*
Prerequisite(s): for Computer Engineering majors: ECE 3100, ECE 3710 and ECE 4720 for Electrical Engineering majors: ECE 4500 or ECE 4610 or ECE 4400 or ECE 4210 or ECE 4410 or ECE 4720 or ECE 4132

Department of Industrial and Systems Engineering

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502 ENGINEERING CENTER

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Chairperson: *Robert P. Van Til*

Professors: *Michael P. Polis, Barbara Oakley, Sankar Sengupta, Robert P. Van Til*

Assistant Professors: *Vijitashwa Pandey, Megan O. Conrad Sczygielski*

Adjunct Assistant Professor: *Patrick Hillberg*

Visiting Instructor: *William Edwards*

Advisory Board

The Industrial and Systems Engineering External Advisory and Development Board assists the department in enhancing its educational and research programs and ensuring their relevance to current and emerging technological needs. Board members are:

Kerry Coran, Lean Practitioner, Genesys Health System

Kevin Dahm, Supervising Engineer, DTE Energy Co.

Greggory R. Garrett, CEO & Managing Director, CGS Advisors LLC

Cameron T. Hill, Workplace Organization Lead, World Class Manufacturing, Fiat Chrysler Automobiles

Patrick Hillberg, Solution Architect, Siemens PLM Corp.

Doneen McDowell, Executive Director, Global/GMNA Manufacturing Engineering - Vehicle Systems, General Motors Corp.

Steve Savoie, Head of Industrial Engineering, Advanced Manufacturing Engineering, Fiat Chrysler Automobiles

Michael Sigelko, Chief Body Architect, General Motors Corp.

Bryan Talbert, Container Quality & Procurement Support Manager, General Motors Corp

Anthony Verrino, Head, Stamping Manufacturing Control Operations, Fiat Chrysler Automobiles

Gary Warren, Operations Manager, Rayconnect Inc.

Mission

The Department of Industrial and Systems Engineering carries out the mission of the School of Engineering and Computer Science by offering:

- an undergraduate major in Industrial and Systems Engineering;
- a master's degree program in Industrial and Systems Engineering;
- a master's degree program in Engineering Management with the cooperation of the School of Business Administration;
- a master's degree program in Systems Engineering;
- a graduate certificate program in Productivity Improvement.

Also, the department actively participates in the school-wide Ph.D. program in Systems Engineering.

Accreditation

The undergraduate programs in the Industrial and Systems Engineering Department are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Schedule of classes

Specific offerings for each semester may be found in the Schedule of Classes.

Programs

- Industrial and Systems Engineering, Bachelors of Science in Engineering

Industrial and Systems Engineering, Bachelors of Science in Engineering

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. The B.S.E. in Industrial and Systems Engineering program is accredited by the Engineering Accreditation Commission of ABET.

Program educational objectives

The educational objectives of the Industrial and Systems Engineering B.S.E. program are to produce graduates who will:

- design, develop and implement 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:

1) General education courses (excluding mathematics and sciences) - 28 credits

- In order to satisfy both general education and other program requirements, in the following general education areas students should select the from the listed courses:
    - Western Civilization (this course also satisfies Ethics requirement, see below) - PHL 1310
    - Social Science (any one of these courses also satisfies Economics requirement, see below) - ECN 1500, ECN 2010, ECN 2020, or ECN 2100
    - Writing Foundations - WRT 1060
    - Formal Reasoning - MTH 1554
    - Natural Science and Technology - EGR 2400 or EGR 2500
    - Knowledge Applications - MTH 1555
    - Capstone and Writing Intensive in the Major - ISE 4491
- 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.

2) Mathematics and sciences - minimum of 32 credits

- 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)** or MTH 2554 - Multivariable Calculus **(4)**
- CHM 1430 - Chemical Principles **(4)** or CHM 1440 **(4)** and CHM 1470 **(1)**
- PHY 1610 - Fundamentals of Physics I **(4)** or PHY 1510 **(5)**
- PHY 1620 - Fundamentals of Physics II **(4)** or PHY 1520 **(5)**
- An approved math or science elective from the list below **(4)**

3) Engineering core courses – 21 credits

- 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)**

4) Professional courses – 47 credits

Required professional courses - 35 credits

- 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)**

Elective professional courses - 12 credits with at least 8 credits from Group A

Group A

- ISE 4410 - Supply Chain Modeling and Analysis **(4)**
- ISE 4422 - Robotic Systems **(4)**
- ISE 4431 - Engineering Operations Research - Stochastic Models **(4)**
- ISE 4441 - Human Factors Engineering **(4)**
- ISE 4450 - Fundamentals of Energy Management **(4)**
- ISE 4461 - PLM Applications - Product Data Management **(2)**
- ISE 4462 - PLM Applications - Robotics **(2)**
- ISE 4463 - PLM Applications - Ergonomics **(2)**
- ISE 4464 - Design for Manufacturing and Assembly Analysis **(4)**
- ISE 4466 - PLM Applications - Change Management **(2)**
- ISE 4480 - E-Commerce and ERP **(4)**
- ISE 4482 - Engineering Processes Decisions Using ERP **(4)**
- ISE 4488 - Foundations of Systems Engineering II **(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 4998 - Senior Project **(2 TO 4)** *
- ISE 4996 - Independent Study **(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.

TOTAL CREDITS – 128

List of approved math or science electives.

Select one course from the following list. 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.

Major Standing

Students must obtain major standing in order to enroll in 3000-level or higher-level courses and become a candidate for the Bachelor of Science in Engineering with a major in industrial and systems engineering. An application for major standing should be submitted to the SECS Undergraduate Advising Office during the semester in which a student completes all requirements for major standing as listed below. Application forms may be obtained from the SECS Undergraduate Advising Office or from the SECS website.

Major standing requires the satisfactory completion of the following required courses in mathematics, science and the engineering core:

- Mathematics: MTH 1554, MTH 1555 and APM 2555
- Science: CHM 1430, PHY 1610 and PHY 1620
- Engineering core: EGR 1200, EGR 1400, EGR 2400, EGR 2500, EGR 2600 and EGR 2800

In order to satisfactorily complete the requirements for major standing, a student must:

1. have an grade point average of at least 2.0 (C) in each of the mathematics, science and engineering core course groupings listed above; and
2. have no more than two grades below C in the twelve required courses listed above; and
3. not have attempted any of the twelve required courses more than three times; and
4. not have repeated more than three different courses from the twelve required courses.

Required courses in which a W (withdrawal) grade is recorded will not be counted toward the four major standing requirements listed above.

Conditional major standing may be granted during the semester in which the student is enrolled in EGR 2800.

Performance requirements

In addition to all previously stated requirements, satisfactory completion of the industrial and systems engineering program requires a grade-point average of at least 2.0 (C) within each of the following three groups of courses: mathematics and sciences courses, engineering core courses, and professional courses (required and electives). 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 is permitted.

Ethics requirement

All industrial and systems engineering students must also fulfill the ethics requirement. This requirement may be met by completion of PHL 1310.

Economics requirement

All industrial and systems engineering students must also fulfill the economics requirement. This requirement may be met by completion of ECN 1500, ECN 2010, ECN 2020 or ECN 2100.

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)**

Courses

ISE 1150 - How Things Work (4)

For non-science majors, a practical introduction to engineering and science in everyday life. This course considers objects from our daily environment and focuses on their principles of operation, histories and relationships to one another. ISE 1150 emphasizes concepts from mechanical and thermal objects. *Satisfies the university general education requirement in the knowledge application integration area.*
Prerequisite(s): completion of the general education requirement in the writing foundation area.

ISE 1170 - Learning How to Learn (4)
Learning How to Learn gives students practical insight, based on research findings from neuroscience and cognitive psychology, on how to learn more deeply and with less frustration. *Satisfies the university general education requirement in the social science knowledge exploration area.*

ISE 3318 - Engineering Statistics and Economic Analysis (4)
Simple linear and multiple linear regression analysis, design of experiments - single factor, full factorial, fractional factorial design. Taguchi's method, control charts, and time series analysis. Engineering cost models, equivalence analysis, estimation of net present value, rate of return, depreciation and taxes, incremental analysis, and uncertainty in cash flow. Offered fall.
Prerequisite(s): EGR 2600 and major standing.

ISE 3330 - Engineering Operations Research (3)
Introduction to operations research models used in decisionmaking and system performance evaluation. Topics include linear programming including simplex method and duality theory, integer linear programming, the assignment and transportation problems, network flows and dynamic programming. Cross-listed with MOR 3330. Offered winter.
Prerequisite(s): major standing.

ISE 3341 - Ergonomics and Work Design (4)
Design, analysis, and measurement of work: work/time studies, pre-determined time studies, and line/work balancing techniques for both repetitive and non-repetitive work. Anthropometry and techniques for consideration of anthropometric data in the design and analysis of work. Offered fall. With laboratory.
Prerequisite(s): major standing.

ISE 4410 - Supply Chain Modeling and Analysis (4)
Concepts, procedures and optimization methodologies for modeling a supply chain and the analysis of its performance. Relevant issues affecting the efficiency of a supply chain. Examples

of globally dispersed supply chains will be considered.
Prerequisite(s): major standing

ISE 4422 - Robotic Systems (4)
Overview of industrial robotic manipulators, their components and typical applications. Kinematics of robots and solution of kinematic equations. Trajectory planning and the Jacobian matrix. Robot programming languages and task planning. Laboratory experience in the development and implementation of a kinematic robot controller using a reconfigurable industrial manipulator. Demonstrations and applications using industrial robots. With laboratory. Credit cannot be received for both ISE 4422 and ME 4740. Offered fall.
Prerequisite(s): major standing.

ISE 4431 - Engineering Operations Research - Stochastic Models (4)
Review of linear programming, duality theory, integer programming, and nonlinear programming. Topics include stochastic dynamic programming, ergodic and absorbing Markov chains with applications, and queuing models with applications based on birth-death process. Introduction to stochastic inventory models and Markov decision processes with applications. Offered fall.
Prerequisite(s): ISE 3330 and major standing

ISE 4441 - Human Factors Engineering (4)
Human body's physical capabilities impacting work design and productivity; its functional capabilities: joint stresses; fatigue analysis. Biomechanical principles applied to design and analysis of work: posture analysis, lifting aids; risk assessment. Work related infractions: repetitive injury; non-repetitive injury. Human body's sensory and cognitive limitations in the work environment. Offered winter.
Prerequisite(s): ISE 3341 and major standing.

ISE 4450 - Fundamentals of Energy Management (4)
Basic concepts involving energy usage in residential, commercial and industrial enclosures, heat transfer and infiltration, electric and natural gas utilization, performing energy assessments, optimizing usage through increased efficiency and alternative energy technology, cost-benefit analysis. The course focuses on using energy assessments to manage energy efficiently.
Prerequisite(s): major standing.

ISE 4461 - PLM Applications - Product Data Management (2)
Methodologies and application of Product Lifecycle Management (PLM) software tools used for Product Data Management (PDM) and CAD to author and manage product data. Course will

emphasize hands-on use of state-of-the-art PLM tools and their application.
Prerequisite(s): major standing.

ISE 4462 - PLM Applications - Robotics (2)
Methodologies and application of Product Lifecycle Management (PLM) software tools for modeling and analyzing robotic systems. Course will emphasize hands-on use of state-of-the-art PLM tools and their application.
Prerequisite(s): ISE 4484 or ISE 4422, major standing

ISE 4463 - PLM Applications - Ergonomics (2)
Methodologies and application of Product Lifecycle Management (PLM) software tools for ergonomics modeling and analysis. Course will emphasize hands-on use of state-of-the-art PLM tools and their application.
Prerequisite(s): ISE 3341, major standing.

ISE 4464 - Design for Manufacturing and Assembly Analysis (4)
Role of a geometric modeler in design and manufacturing. Representation of wire-frame, surface, solid models and feature-based models. Different standards for representation of geometric data. Analysis of a design for DF(x) principles that include manufacturing, assembly, disassembly and environment. With laboratory.
Prerequisite(s): major standing.

ISE 4466 - PLM Applications - Change Management (2)
Methodologies and application of Product Lifecycle Management (PLM) software tools used to capture a complex product's definition, functional and physical requirements towards designing, developing and managing it through its lifecycle. Course will emphasize hands-on use of state-of-the-art PLM tools and their application.
Prerequisite(s): major standing

ISE 4469 - Computer Simulation of Discrete Event Systems (4)
Simulation as modeling tool for discrete-event systems, general principles of simulation, statistical models, input modeling, random variable generation, model building using a commercial simulation language, model verification and validation, determination of run length, output analysis variance reduction techniques. Design and optimization of production service systems. With laboratory. Offered winter.
Prerequisite(s): ISE 3318 and major standing.

ISE 4480 - E-Commerce and ERP (4)

This course focuses on the evolving technologies on the World Wide Web that support new models of business including 1) electronic commerce with concerns of fault tolerance, security, and 24x7 availability; and 2) ERP with concerns of financial, human resource and manufacturing systems integrating into inter-company supply chain systems. Offered fall.
Prerequisite(s): major standing.

ISE 4482 - Engineering Processes Decisions Using ERP (4)
Examines three major steps in the deployment of an Enterprise Resource Planning (ERP) system: criteria for the selection of a system; configuration of the selected system to match a company's business processes; and execution of business processes as well as making decisions supported by the ERP system. The course is case-based and will give students access to an instance of an ERP system.
Prerequisite(s): major standing

ISE 4483 - Production Systems and Workflow Analysis (4)
Design issues to control the flow of material in manufacturing systems from forecast to finished product. Topics include aggregate planning and disaggregation, inventory control, MRP, JIT systems, scheduling, project planning and resource balancing, application of lean principles, theory of constraints and supply chain, facilities planning and layout. Offered fall.
Prerequisite(s): ISE 3330 and major standing.

ISE 4484 - Flexible and Lean Manufacturing Systems (4)
Technologies and concepts that make manufacturing systems flexible: CAM, Group Technology (GT), Computer Numerically Controlled (CNC) machining centers, robotics, automated warehousing (AS/RS), vision systems, material transport, Programmable Logic Controllers (PLC). Introduction to lean manufacturing. With laboratory. Credit cannot be received for both ISE 4484 and ME 4710. Offered winter.
Prerequisite(s): major standing.

ISE 4485 - Statistical Quality Analysis (4)
Fundamentals of statistical quality control, control charts for variable and attribute data, custom charts, DNOM charts, estimation of process capability, statistical tolerancing and sampling plans. Fundamentals of design of experiments and application to product/process design. Taguchi's approach to robust design and related topics. Offered winter.
Prerequisite(s): ISE 3318 and major standing.

ISE 4487 - Foundations of Systems Engineering (4)
Techniques for generation, analysis and verification of traceable product requirements. System performance and structural modeling using object, behavioral and other models. Techniques

for analysis of system for serviceability, reliability, maintainability and testability. System alternative trade-off study techniques. System life cycle and other tools for implementation of systems engineering techniques. Offered winter.
Prerequisite(s): major standing.

ISE 4488 – Advanced Systems Engineering (4)
Theories behind system realization: identifying and encoding customer needs; identifying stakeholders and modeling their preferences; uncertainty modeling and propagation; optimization in engineering design; design churn; design for X; design flexibility and its importance in large-scale engineering projects; and public policy.
Prerequisite(s): ISE 4487 and major standing.

ISE 4491 - Senior Design (4)
Capstone design project selected from manufacturing systems, automotive or industrial systems, instrumentation and measurement, and control systems. Develops system approach to design; preparation of specifications, scheduling, modeling, simulation, and technological, financial environmental aspects. Teamwork is emphasized. *Satisfies the university general education requirement for the capstone experience. Satisfies the university general education requirement for a writing intensive course in the major. Prerequisite for writing intensive: completion of the university writing foundation requirement.*
Prerequisite(s): ISE 3318, ISE 3330, ISE 3341 and major standing. Prerequisite(s) with concurrency: ISE 4483 or ISE 4484.

ISE 4900 - Special Topics (2 TO 4)
Advanced study of special topics in engineering. May be taken more than once.
Prerequisite(s): major standing.

ISE 4996 - Independent Study (2 TO 4)
Advanced individual study in a special area. Topic must be approved prior to registration. May be taken more than once.
Prerequisite(s): major standing.

ISE 4998 - Senior Project (2 TO 4)
Independent work on advanced laboratory projects. Topic must be approved prior to registration. May be taken more than once.
Prerequisite(s): major standing.

Department of Mechanical Engineering

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402 ENGINEERING CENTER

(248) 370-2210

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Chairperson: *Brian P. Sangeorzan*

Professors emeriti: *Bhushan Bhatt, Robert Edgerton, Michael Y.Y. Hung, Gilbert L. Wedekind*

Professors: *Gary C. Barber, Randy Gu, Laila Guessous, Zissimos P. Mourelatos, Sayed Nassar, Brian P. Sangeorzan, Xia Wang, Lianxiang Yang, Qian Zou*

Associate professors: *Yin-Ping Chang, Sergey Golovashchenko, Ching L. Ko, Krzyszto Kobus, Michael A. Latcha, James D. Schall*

Assistant professor: *Dan DelVescovo, Jonathan Maisonneuve, Peng Zhao*

Special Instructors: *Jim Leidel, Zhijun Wu*

Adjunct professors: *Ismat Abu-Isa, Alex Alkidas, Dennis Corrigan, Yung-Li Lee, Turgay Bengisu, Edward Groff*

Advisory Board

The Mechanical Engineering Advisory Board assists the department in enhancing its educational and research programs and ensuring their relevance to current and emerging technological needs. Board members are:

Ray Kuczera, Ph.D., Vice President of Engineering, GKN Driveline

Yung -Li Lee, Ph.D., Senior Technical Specialist, Fiat Chrysler Automobiles

Yucong Wang, Ph.D., Manager, Department of Materials Technology, General Motors Powertrain

David Lamb, Ph.D., Subject Technical Expert, Modeling and Simulation, TARDEC

Ren-Jye Yang, Ph.D., Senior Tech Leader, Optimization and Robustness, Ford

Rohit Paranjpe, Ph.D., Director, Powertrain Virtual Analysis, Fiat Chrysler Automobiles

Dennis Corrigan, Ph.D., President, DC Energy Consulting

David Sonntag, MSc., Manager of Capital Projects, Detroit Edison Company

General Information

The Department of Mechanical Engineering carries out the mission of the School of Engineering and Computer Science by offering undergraduate majors in mechanical engineering including various depth areas. The department also offers a master's program in mechanical engineering and a Ph.D. program in mechanical engineering. The Mechanical Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

Schedule of classes

Specific offerings for each semester may be found in the Schedule of Classes.

Programs

- Mechanical Engineering, B.S.E.

Mechanical Engineering, B.S.E.

Requirements for the major in mechanical engineering, B.S.E. program

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 (excluding mathematics and sciences) -- 28 credits

- Students are required to take PHL 1310 - Introduction to Ethics in Science and Engineering to satisfy the General Education Requirements in Western Civilization.
- To satisfy the General Education Requirements in Social Science, mechanical engineering students are required to take one of the following economics courses: ECN 1500, ECN 2010, ECN 2020, or ECN 2100.
- 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 - 32 credits

- 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 **(4)** and CHM 1470 **(1)**])
- PHY 1610 - Fundamentals of Physics I **(4)** or [PHY 1510 **(4)** and PHY 1100 **(1)**]
- PHY 1620 - Fundamentals of Physics II **(4)** or [PHY 1520 **(4)** and PHY 1110 **(1)**]

Select one course from the list below.

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 and 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)**
- CHM 1450 - General Chemistry II **(4)** and CHM 1480 - General Chemistry Laboratory II **(1)**
- BIO 1200 - Biology I **(4)**
- PHY 3250 - Biological Physics **(4)**
- PHY 3310 - Optics **(4)**
- PHY 3660 - Vibrations and Waves **(4)**
- PHY 3710 - Foundations of Modern Physics **(4)**
- MTH 2775 - Linear Algebra **(4)**
- MTH 3552 - Complex Variables **(4)**
- Other courses approved by petition to the SECS Committee on Academic Standing.

Engineering core -- 21 credits

- 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 -- 35 credits

- ME 3300 - Computer-Aided Design **(3)**
- ME 3200 - Engineering Mechanics **(4)**
- ME 3500 - Introduction to Fluid and Thermal Energy Transport **(4)**
- ME 3250 - Mechanics of Materials **(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)** (or ME 4550 - Fluid and Thermal Systems Design **(4)**)
- ME 4999 - Senior Mechanical Engineering Design Project **(4)** (or ME 4998 **(3 to 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 --12 credits

Mechanical engineering students must complete at least 12 additional credits of 4000- or 5000-level engineering 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 - Fluid Transport **(4)**
- ME 4520 - Thermal Energy Transport **(4)**

Other relevant courses

- ME 4530 - Alternative Energy Systems **(4)**
- ME 4500 - Energy Systems Analysis and Design **(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 4500 - Energy Systems Analysis and Design **(4)**
- ME 4540 - Internal Combustion Engines I **(4)**

Other relevant courses

- ME 4260 - Acoustics and Noise Control **(4)**
- ME 4510 - Fluid Transport **(4)**
- ME 4520 - Thermal Energy Transport **(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 - Thermal Energy Transport **(4)**
- ME 4500 - Energy Systems Analysis and Design **(4)** *(ME 4500* **(4)** *could be taken as part of the required professional subjects)*
- 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. The specialization will be noted on the student's transcript.

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:

- ME 4220 - Vehicle Dynamics **(4)**

- ME 4350 - Mechanical Computer-Aided Engineering **(4)**
- ME 4500 - Energy Systems Analysis and Design **(4)**
- ME 4540 - Internal Combustion Engines I **(4)**

Select at least 4 credits from the following:

- ME 4260 - Acoustics and Noise Control **(4)**
- ME 4510 - Fluid Transport **(4)**
- ME 4630 - Lubrication, Friction, and Wear **(4)**
- ECE 4110 - Automotive Electronics **(4)**
- ECE 4520 - Automotive Mechatronics I **(4)**
- ME 4900 - Special Topics **(2 TO 4) /5900 with prior approval (2-4)**
- **ME 5560 - Combustion processes (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:

- 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 4750 - Optical Measurement and Quality Inspection **(4)**
- ME 4710 - Flexible and Lean Manufacturing Systems **(4)**

- ME 4740 - Robotic Systems **(4)**
- ECE 4400 - Automatic Control Systems **(4)**
- ISE 4485 - Statistical Quality Analysis **(4)**
- ME 4900 - Special Topics **(2 TO 4) /5900 - with prior approval (2-4)**
- **ME 5700 - Polymer Processing (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

- ME 4510 - Fluid Transport **(4) or ME 4520 - Thermal Energy Transport**
- ME 4500 - Energy Systems Analysis and Design **(4)**
- ME 4530 - Alternative Energy Systems **(4)**

Select at least 8 credits from the following:

- ME 4510 - Fluid Transport **(4) if not taken as a required fundamental subject**
- ME 4520 - Thermal Energy Transport **(4) if not taken as a required fundamental subject**
- 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)**
- PHY 3180 - Nuclear Physics Laboratory **(2)** *(requires ME 4580 (3) as a pre- or co-requisite)*
- ME 4996 - Independent Study **(1 TO 4) with prior approval**

- ME 4900 - Special Topics **(2 TO 4) /ME 5900 with prior approval**
- **ME 5560 - Combustion processes (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.

To gain major standing in Mechanical Engineering, students must:

A) have an average of at least 2.0 (C) in the following mathematics and science courses: MTH 1554, MTH 1555, APM 2555, CHM 1430 (or CHM 1440 and CHM 1470), PHY 1610 (or PHY 1510 and PHY 1100), PHY 1620 (or PHY 1520 and PHY 1110).

B) have an average of at least 2.0 (C) 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 in A and B above;

D) have not attempted any course listed in A and B above more than three times. Students may petition to repeat a course a fourth time; and

E) have not repeated more than three different courses. 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 an average grade of at least 2.0 (C) within each course group: namely, mathematics and sciences, engineering core, and professional subjects (required and elective). Within professional subjects, at most two grades below C are permitted; at most two different courses may be repeated, and a total of three repeat attempts 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

- EGR 1200 - Engineering Graphics and CAD **(1)**
- MTH 1554 - Calculus I **(4)**
- CHM 1430 - Chemical Principles **(4)**
- EGR 1400 - Computer Problem Solving in Engineering and Computer Science **(4)**
- **General education (4)**

Winter semester -- 16 total credits

- MTH 1555 - Calculus II **(4)**
- PHY 1610 - Fundamentals of Physics I **(4)**
- EGR 2400 - Introduction to Electrical and Computer Engineering **(4)**
- **General education (4)**

Sophomore year

Fall semester -- 16 total credits

- APM 2555 - Introduction to Differential Equations with Matrix Algebra **(4)**
- PHY 1620 - Fundamentals of Physics II **(4)**
- EGR 2500 - Introduction to Thermal Engineering **(4)**
- **General education (4)**

Winter semester -- 16 total credits

- MTH 2554 - Multivariable Calculus **(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 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 3300 - Computer-Aided Design **(3)**
- ME 3250 - Mechanics of Materials **(4)**
- **Professional elective (4)**
- **Approved Math/Science elective (4)**

Senior year

Fall semester -- 16 total credits

- ME 4200 - Vibrations and Controls **(4)**
- **Two professional subjects (required or elective) (8)**
- **General education (4)**

Winter semester -- 16 total credits

- ME 4999 - Senior Mechanical Engineering Design Project **(4)**
- ME 4300 - Mechanical Systems Design **(4)**
- **One professional subject (required or elective) (4)**

- **General education (4)**

Courses

ME 3200 - Engineering Mechanics (4)
Statics and dynamics of particles and rigid bodies: analysis of structures, centroids and moments of inertia; kinematics, Newton's Second Law, work and energy, linear and angular impulse and momentum. With laboratory. Offered fall and winter.
Prerequisite(s): EGR 2800 with a grade of (C) or higher and major standing.

ME 3250 - Mechanics of Materials (4)
Introduction to the mechanics of deformable bodies: distribution of stress and strain in beams, shafts, columns, pressure vessels and other structural elements, factor of safety, yield criteria of materials with applications to design. With laboratory. Offered fall and winter.
Prerequisite(s): EGR 2800 with a grade of (C) or higher and major standing.
Pre/Corequisite(s): ME 3200

ME 3300 - Computer-Aided Design (3)
Use of engineering software in design and analysis such as: solid modeling of machine parts, projection views layout, parametric and knowledge-based design, assembly design, sheet and metal design, bill of materials, structure design, introduction of finite element method, engineering optimization, space analysis and clash detection, mechanism and kinematics of assemblies. Offered fall and winter.
Pre/Corequisite(s): ME 3250 and major standing.

ME 3500 - Introduction to Fluid and Thermal Energy Transport (4)
The fundamentals of fluid mechanics and heat transfer; fluid statics, conservation of mass and momentum; inviscid flow; internal viscous flow analysis; introduction to boundary layer theory; heat diffusion equation; dimensionless correlations of convection heat transfer, applications to engineering problems. With laboratory; includes experiment design. Offered fall and winter.
Prerequisite(s): EGR 2500 with a grade of (C) or higher, MTH 2554 and major standing.
Pre/Corequisite(s): EGR 2800

ME 3700 - Properties of Materials (4)
The atomic, molecular and crystalline structure of solids, including a description of x-ray analysis, metallography and other methods of determining structure; correlation of structure with the electric, magnetic and mechanical properties of solids. With laboratory. Offered fall and winter.
Prerequisite(s): CHM 1430 or CHM 1440 and PHY 1620 or PHY 1520 and major standing.

ME 4200 - Vibrations and Controls (4)
Linear free and forced response of one- and multiple-degree freedom systems. Equations of motion of discrete systems. Vibration isolation, rotating imbalance and vibration absorbers. Transfer function and state-space approaches to modeling dynamic systems. Time and frequency domain and analysis and design of control systems. Use of MATLAB. Offered fall and winter.
Prerequisite(s): ME 3200, MTH 2554, APM 2555 and major standing.

ME 4210 - Analysis and Design of Mechanical Structures (4)
Methods of advanced mechanics of materials applied to the design of mechanical structures. Topics include stress and strain analysis, force equilibrium, deformation compatibility, torsion of non-circular cross-sections, torsion of thick-walled tubes, shear centers, non- symmetric binding, curved and composite beams and thick-walled cylinders. Generally offered Fall.
Prerequisite(s): ME 3250 and major standing.

ME 4220 - Vehicle Dynamics (4)
Vehicle dynamics analyses including: governing equation of motion, road loads, gradeability, aerodynamic forces and moments, longitudinal acceleration and braking performance prediction, lateral handling characteristics, vertical comfortability criteria, vehicle ride evaluation, and operating fuel economy analysis. Generally offered winter.
Prerequisite(s): ME 3200 and major standing.

ME 4260 - Acoustics and Noise Control (4)
Introduction to vibrations and waves; plane and spherical acoustic waves; sound generation, transmission and propagation; sound intensity and power; principles and definitions of noise control; sound and hearing; hearing conservation; community, building and industrial noise control; measurement of sound. Generally offered fall.
Prerequisite(s): ME 3200, MTH 2554, APM 2555,and major standing.

ME 4300 - Mechanical Systems Design (4)
Study of systems involving mechanical elements. Includes safety, stress, strength, deflection economic and social considerations, optimization criteria and strategies. Analysis and design of fasteners, springs, welds, bearings, power transmitting elements and complex structures subjected to static and/or dynamic loads. With project. Offered fall and winter.
Prerequisite(s): ME 3300, ME 3700, ME 3250 and major standing.

ME 4350 - Mechanical Computer-Aided Engineering (4)
Introduction to the use of state-of-the-art finite element technology in mechanical engineering analysis. Fundamentals of computer graphics, solid modeling, finite element modeling and

interactive design. Analysis and evaluation of linear static and dynamic mechanical systems. With project. Generally offered fall.
Prerequisite(s): ME 3300, ME 3250, and major standing.

ME 4360 - Mechanical Computer-Aided Manufacturing (4)
Use of CAM software in various aspects of manufacturing processes. GDT and tolerance analysis; surface design, managing cloud points and reverse engineering; simulation of kinematics of machine tools; 3-axis surface machining; mold tooling design; CMM and measurement data analysis; assembly simulation and structural analysis, rapid-prototyping. With project. Generally offered winter.
Prerequisite(s): ME 3300, ME 3250 and major standing.

ME 4500 - Energy Systems Analysis and Design (4)
The analysis and design of thermodynamic systems. Applications include thermodynamic cycles for power; thermodynamics of non-reacting mixtures including psychrometry; concepts of available energy and application to process/system optimization; the thermodynamics of reacting mixtures, including chemical equilibrium concepts, applied to combustion systems. With project. Offered fall and winter.
Prerequisite(s): EGR 2500 with a grade of (C) or higher and major standing.

ME 4510 - Fluid Transport (4)
Continued study of the fundamentals of fluid mechanics and their applications, angular momentum principle; generalized study of turbo-machines, potential flow of inviscid fluids, laminar and turbulent boundary layer theory, dimensional analysis and similitude, compressible flow. With laboratory. Generally offered fall.
Prerequisite(s): ME 3500 and major standing.

ME 4520 - Thermal Energy Transport (4)
Continued study of properties and descriptions of conduction, convection and thermal radiation heat transfer; thermal boundary layer theory; forced and natural convection, heat transfer correlations. Thermodynamics of thermal radiation, radiation intensity, surface properties and energy exchange. Laboratory emphasizes experimental design and development of empirical relationships. Generally offered winter.
Prerequisite(s): ME 3500 and major standing.

ME 4530 - Alternative Energy Systems (4)
The analysis and design of alternative energy conversion systems. Primary topics include biomass energy conversion, including biofuels, solar and wind power will be primary topics. Other topics include fuel cells, geothermal energy and hydroelectric power. With project.

Generally offered winter.
Prerequisite(s): ME 3500 and major standing.

ME 4540 - Internal Combustion Engines I (4)
Introduction to thermodynamics, fluid mechanics and performance of internal combustion engines including: introduction to engine types and their operation, engine design and operating parameters, ideal thermodynamic cycles, thermodynamics of actual working fluids and actual cycles, gas exchange processes, heat losses, performance, exhaust gas analysis and air pollution. Generally offered fall.
Prerequisite(s): ME 3500 and major standing.

ME 4550 - Fluid and Thermal Systems Design (4)
Applications of fluid and thermal transport and energy conversion concepts. Component and system analyses and design refinement using integral, differential and lumped-parameter modeling techniques. The course focuses on the design process using design-oriented projects. Generally offered fall.
Prerequisite(s): ME 3500 and major standing.

ME 4580 - Fundamentals of Nuclear Engineering (3)
Fundamental concepts of atomic and nuclear physics; interaction of radiation with matter; nuclear reactors and nuclear power; neutron diffusion and moderation; heat removal from nuclear reactors; radiation protection and shielding; reactor licensing, safety and the environment; applications in power generation and medicine. Generally offered fall.
Prerequisite(s): ME 3500, ME 3700 and major standing.

ME 4585 - Nuclear Reactors and Power Plants (3)
The study of various nuclear power plant types and systems; Rankine Cycle thermodynamics; BWR, ESBWR and PWR power plants; engineered safety systems; nuclear regulations, codes and standards; reactor safety fundamentals; economic and environmental issues. Generally offered winter.
Prerequisite(s): ME 4500, ME 4580, and major standing.

ME 4600 - Materials Properties and Processes (4)
Study of mechanical behavior of real engineering materials and how they influence mechanical design. True stress/strain properties of materials, plastic deformation and fracture of materials, failure theories, fatigue damage under cyclic loading, creep and high temperature applications. Material properties of engineering metals, ceramics and composites. Behavior of materials during and after manufacturing processes such as stamping, drawing, extrusion, etc. Generally

offered winter.
Prerequisite(s): ME 3250, ME 3700 and major standing.

ME 4610 - Polymeric Materials (4)
Terminology and nomenclature for plastics. General topics dealing with plastics, such as structure, morphology, properties, etc. Focus on mechanical and physical properties and mechanical behavior of plastics. Technology related to plastics processing, testing, designing and recycling is introduced. Generally offered winter.
Prerequisite(s): ME 3700 and major standing.

ME 4620 - Plastics Product Design (4)
Design of plastic/composite products based on strength, stiffness, creeping, impacting, chemical and environmental deterioration. Effects of processing on part quality and performance. Design of plastic parts for manufacturability. Prototyping plastic parts. Design of plastic parts for joining and assembly. Use of CAD/CAM/CAE software for structural analysis and design optimization.
Prerequisite(s): ME 4610 and major standing.

ME 4630 - Lubrication, Friction, and Wear (4)
Study of fundamental wear mechanisms including: adhesive, abrasive, corrosive and surface fatigue; boundary and hydrodynamic lubrication; friction theories; surface topography characterization. Applications: journal and ball bearings, gears and engine components. Generally offered fall.
Prerequisite(s): ME 3700
Pre/Corequisite(s): ME 3500 and major standing.

ME 4700 - Manufacturing Processes (4)
Fundamentals and technology of machining, forming, casting and welding. Mechanics of cutting. Molding of polymers. Tolerancing and surface topography. Manufacturing considerations in design. Economics of manufacturing. Process assembly and product engineering. Lab to be arranged. Generally offered fall.
Prerequisite(s): ME 3700 and major standing.

ME 4710 - Flexible and Lean Manufacturing Systems (4)
Technologies and concepts that make manufacturing systems flexible: CAM, Group Technology (GT), Computer Numerically Controlled (CNC) machining centers, robotics, automated warehousing (AS/RS), vision systems, material transport, Programmable Logic Controllers (PLC). Introduction to lean manufacturing. With laboratory. Credit cannot be received for both ISE

4484 and ME 4710. Generally offered winter.
Prerequisite(s): Major standing.

ME 4720 - Product and Process Development (4)
Topics include traditional and nontraditional approaches in product and process development and optimization, including conventional experimental mechanics and acoustic test methods. The Taguchi approach and other methods for design of experiments are used to study the interaction of variables and to attain optimization.
Prerequisite(s): ME 3250 and major standing.

ME 4730 - Fasteners and Bolted Joints (4)
Analysis, design, and reliability of bolted joint systems under static and dynamic loads. Topics include torque-tension-turn formulation, process control, service and environmental loads, fatigue, elastic interaction, vibration loosening, creep relaxation, and corrosion. With laboratory experiments. Generally offered fall.
Prerequisite(s): ME 4300 and major standing.

ME 4740 - Robotic Systems (4)
Overview of industrial robotic manipulators, their components and typical applications. Kinematics of robots and solution of kinematic equations. Trajectory planning and the Jacobian matrix. Robot programming languages and task planning. Laboratory experience in the development and implementation of a kinematic controller using a reconfigurable industrial manipulator. Demonstrations and application using industrial robots. Generally offered fall. Credit cannot be received for both ISE 4422 and ME 4740.
Prerequisite(s): ME 3200 and major standing.

ME 4750 - Optical Measurement and Quality Inspection (4)
State-of-the art optical methods including TV-holography/electronic speckle pattern interferometry, shearography, digital image correlation, three-dimensional computer vision, and laser triangulation; with applications to measurement of displacement, strain/stress, vibrational mode, material properties, three-dimensional shape, quality inspection and nondestructive testing. With laboratory. Generally offered fall and winter.
Prerequisite(s): ME 3250 and major standing.

ME 4900 - Special Topics (2 TO 4)
Advanced study of special topics in engineering. May be taken more than once.
Prerequisite(s): major standing and senior standing.

ME 4995 - Directed Research (4)

Directed undergraduate design or research project under the direction of a mechanical engineering faculty. Topic must be approved by the faculty mentor and by the department prior to registration.
Prerequisite(s): ME 3300, ME 3500, ME 3250, ME 3700, and major standing. Approval of project or research proposal by Mechanical Engineering Department.

ME 4996 - Independent Study (1 TO 4)
Advanced individual study in a special area. Topic must be approved prior to registration. May be taken more than once.
Prerequisite(s): major standing and senior standing.

ME 4998 - Senior Project (3 TO 4)
Work on an advanced design project under the direction of a mechanical engineering faculty member as an alternative to ME 4999. Project proposal must be approved by the faculty member and department prior to registration. Student must work as part of a team of at least two people.
Prerequisite(s): ME 3250, ME 3300, ME 3500, ME 3700, and major standing. Approval of project proposal by Mechanical Engineering Department.

ME 4999 - Senior Mechanical Engineering Design Project (4)
Multi-disciplinary team experience in engineering design, emphasizing realistic constraints such as safety, economic factors, reliability, aesthetics, ethics and societal impact. Projects will be supervised by engineering faculty. Generally offered fall, winter. *Satisfies the university general education requirement for the capstone experience. Satisfies the university general education requirement for a writing intensive course in the major. Prerequisite for writing intensive: completion of the university writing foundation requirement.*
Prerequisite(s): ME 3250, ME 3300, ME 3500, ME 3700 and major standing.

Bioengineering and Engineering Sciences Programs

Bioengineering

Coordinator: *Dr. Shailesh Lal*

Associate Professors: *Dr. Gerard J. Madlambayan, Dr. Jing Tang*

The major in Bioengineering, offered jointly by the School of Engineering and Computer Science and the College of Arts and Sciences, leads to the Bachelor of Science degree. It is a discipline that applies engineering principles to the biological sciences and applies them to the design and

analysis of biological systems and technologies. Students should consult with advisers for the majors to be certain they are on track for all requirements.

Engineering Chemistry Program

Coordinators: *James D. Schall (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.

Engineering Physics Program

Coordinators: *Hoda Abdel-Aty-Zohdy (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, and 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.

Schedule of classes

Specific offerings for each semester may be found in the Schedule of Classes.

Programs

- Bioengineering, B.S.
- Engineering Chemistry, B.S.
- Engineering Physics, B.S.

Bioengineering, B.S.

Requirements for the major in bioengineering

Course requirements (minimum of 129 total credits)

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 Mathematics & Sciences (52 credits), Engineering Core (21 credits), and Bioengineering Required (12 credits) courses. Students will broaden knowledge in a specific area of Bioengineering by electing a sequence of courses in professional option tracks to satisfy the Bioengineering electives requirement (16 credits). Alternatively, students may elect any combination of courses listed under these professional option tracks to meet this requirement as long as 12 credits are from courses with engineering-based material.

General education -- 28 credits

- Students are required to take PHL 1310 - Introduction to Ethics in Science and Engineering **(4)** to satisfy the Western Civilization requirement.
- To satisfy the General Education Requirements in Social Science, Bioengineering students are required to take one of the following economics courses: ECN 1500, ECN 2010, ECN 2020, or ECN 2100.
- 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.

Math and Science - 52 credits

- 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 - 21 credits

- 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)**

Bioengineering Required Courses - 12 credits

- BE 3899 - Introduction to Engineering Biology **(4)**
- ECE 4900 - Special Topics **(2 TO 4)**
- BE 4999 - Research Project/Capstone Design **(4)**

Professional Option Tracks - 16 credits

Track 1: Biomedical Imaging and Signal Processing

- PHY 3260 - Medical Physics **(4)**
- BE 4100 - Biomedical Signal Processing **(4)**
- BE 4110 - Medical Imaging **(4)**
- BE 4120 - Medical Image Analysis **(4)**

Track 2: Bioinformatics and Genome Engineering

- BIO 4412 - Functional Genomics and Bioinformatics **(4)**
- CSI 3450 - Database Design and Implementation **(4)**
- CSI 4780 - Bioinformatics **(4)**
- CSI 4900 - Special Topics **(2 TO 4)**

  - Computational Methods for Biomedical Data (4)

Track 3: Molecular Engineering

- BE 4300 - Bioprocess Engineering **(4)**
- BIO 3500 - General Microbiology **(4)** *
- BIO 4511 - 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 - Biomaterials Approaches in Anatomy **(4)**
- ME 3250 - Mechanics of Materials **(4)**
- ME 4210 - Analysis and Design of Mechanical Structures **(4)**

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.

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 required courses in A and B above;

D) have not attempted any course listed in A and B above more than three times. Students may petition to repeat a course a fourth time; and

E) have not repeated more than three different courses. 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

In addition to the previously stated requirements, satisfactory completion of the program requires an average grade of at least C within each group: mathematics and sciences, engineering core, Bioengineering required, and professional tracks. For Bioengineering required 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 are permitted.

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.

Sample Bioengineering schedule

Students may follow a schedule such as the one indicated below

Freshman year

Fall semester - 17 credits

- MTH 1554 - Calculus I **(4)**
- EGR 1400 - Computer Problem Solving in Engineering and Computer Science **(4)**
- BIO 1200 - Biology I **(4)**
- BIO 1201 - Biology Laboratory **(1)**
- **General Education (4)**

Winter semester - 17 credits

- MTH 1555 - Calculus II **(4)**
- EGR 2400 - Introduction to Electrical and Computer Engineering **(4)**
- PHY 1610 - Fundamentals of Physics I **(4)**
- EGR 1200 - Engineering Graphics and CAD **(1)**
- **General Education (4)**

Sophmore year

Fall semester - 17 credits

- APM 2555 - Introduction to Differential Equations with Matrix Algebra **(4)**
- EGR 2600 - Introduction to Industrial and Systems Engineering **(4)**
- CHM 1440 - General Chemistry I **(4)**
- CHM 1470 - General Chemistry Laboratory I **(1)**
- **General Education (4)**

Winter semester - 16 credits

- MTH 2554 - Multivariable Calculus **(4)**
- EGR 2500 - Introduction to Thermal Engineering **(4)**
- EGR 2800 - Design and Analysis of Electromechanical Systems **(4)**
- **General Education (4)**

Junior year

Fall semester - 17 credits

- CHM 1450 - General Chemistry II **(4)**
- CHM 1480 - General Chemistry Laboratory II **(1)**
- BIO 2600 - Human Physiology **(4)**

- **ECE 4900 - Bioinstrumentation (4)**
- **General Education (4)**

Winter semester - 17 credits

- PHY 1620 - Fundamentals of Physics II **(4)**
- CHM 2340 - Organic Chemistry I **(4)**
- BE 3899 - Introduction to Engineering Biology **(4)**
- BIO 3621 - Physiology Laboratory **(1)**
- **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

- PHY 3250 - Biological Physics **(4)**
- BE 4999 - Research Project/Capstone Design **(4)**
- **Professional track (4)**

Engineering Chemistry, B.S.

Requirements for the major in engineering chemistry, B.S. program

Coordinators: *James D. Schall (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.

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 -- 28 credits (excluding mathematics and science)

- Students are required to take PHL 1310 - Introduction to Ethics in Science and Engineering to satisfy the General Education Requirements in Western Civilization.
- 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 -- 34

- 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)**

Chemistry -- 30 credits

- 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)**
- One lecture or laboratory course above CHM 4000 **(3)**

Engineering core -- 33 credits

Required courses:

- 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)**
- ME 3500 - Introduction to Fluid and Thermal Energy Transport **(4)**

Plus 8 credits from:

- ME 4510 - Fluid Transport **(4)**
- ME 4520 - Thermal Energy Transport **(4)**
- ME 4500 - Energy Systems Analysis and Design **(4)**
- ME 4540 - Internal Combustion Engines I **(4)**
- ME 4550 - Fluid and Thermal Systems Design **(4)**
- ECE 4400 - Automatic Control Systems **(4)**

Capstone Course -- 3-4 credits

- ME 4999 - Senior Mechanical Engineering Design Project **(4)** or
- CHM 4996 - Independent Research **(3)**

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 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.

To gain major standing in Engineering Chemistry, students must meet the following requirements:

A) have an average of at least 2.0 (C) 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 of at least 2.0 (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 required courses in A and B above.

D) have not attempted any course listed in A and B above more than three times. Students may petition to repeat a course a fourth time.

E) have not repeated more than three different courses. 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 in this program are not required to complete the College of Arts and Sciences college exploratory requirements. 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 2.0 (C) in the courses taken to satisfy the engineering and chemistry requirements and in the courses prescribed for the mathematics and science requirements.

Engineering Physics, B.S.

Requirements for the major in engineering physics, B.S. program

Coordinators: *Hoda Abdel-Aty-Zohdy (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 (excluding mathematics and science) -- 28 credits

- Students are required to take PHL 1310 - Introduction to Ethics in Science and Engineering to satisfy the General Education Requirements in Western Civilization.
- 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 -- 48 credits

- 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)**

Must choose one course from the list below:

- PHY 3310 - Optics **(4)**
- PHY 3660 - Vibrations and Waves **(4)**
- PHY 3810 - Electricity and Magnetism **(4)**
- PHY 4720 - Quantum Mechanics I **(4)**

Engineering core -- 21 credits

- 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 -- 11 to 14 credits

- ECE 2005 - Electric Circuits **(4)**
- ECE 3100 - Electronic Circuits and Devices I **(4)**
- PHY 4995 - Independent Research **(3 TO 6)**

Professional depth areas -- 12 credits

The following two depth areas are offered as typical. Select 12 credits from one of these. Students with different interests can construct different depth areas in consultation with the program coordinators.

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 3710 - Computer Hardware Design **(4)**
- ECE 4135 - Integrated Electronics **(4)**
- ECE 4210 - Communication Systems **(4)**
- ECE 4720 - Microprocessors-based Systems 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 3710 - 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.

To gain major standing in Engineering Physics, students must meet the following requirements:

A) have an average of at least 2.0 (C) 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 of at least 2.0 (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 required courses in A and B above.

D) have not attempted any course listed in A and B above more than three times. Students may petition to repeat a course a fourth time.

E) have not repeated more than three different courses. 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 at least 2.0 (C) within each course group: namely, mathematics and sciences, engineering core, and professional subjects (including required professional subjects and professional depth areas). Within professional subjects, 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.

School of Health Sciences

3110 Human Health Building

(248) 370-3562

Fax: (248) 364-8657

Dean: *Kevin A. Ball, Ph.D*.

Office of the Dean: *Kristin Landis-Piwowar, Ph.D., interim associate dean; Maria Ebner-Smith, assistant dean; Michelle D. Southward, director academic advising; William L. Daniels, senior academic adviser, Lauren Creed, academic adviser, Denae May, academic adviser, Nancy Osmialowski, academic adviser, Hnou Vue, academic adviser; Katherine Raybaud, leadership coordinator.*

Board of Advocacy and Resource Development

Michael Antaran - Entrepreneur/ Carrot App creator, OU Alumnus
Reyna Colombo - Physical Therapist, Director of Rehabilitation Services, Beaumont Troy Hospital
Kathy Forzley - Director Oakland County Board of Health and Human Services, 3 time OU Alumnus
Art Griggs - past SHS Assistant Dean, and OU Assistant Provost, OU Alumnus
Darryl Hill - Health and Safety Professional, Abbot Global Healthcare & Research, past-President of ASSE, EHS Industry Advisory Board member
Bob Jarski - SHS Faculty Emeritus, Physician Assistant, Integrative and Holistic Health
Greg Jordan - Director, OU Recreation and Wellness
Ewa Matuszewski - Founder and CEO MedNetOne, Medical Doctor
Telva McGruder - Director, GM Global Facilities & Engineering, Procurement & Contracts

Moon J. Pak - Founder of School of Health Sciences, HALL of fame, Medical Doctor
Tom Spring - Director, HAP Health and Wellness, 3 time OU Alumnus
Teresa Stayer - Physical Therapist, Owner, SpectraMed Inc., OU Alumnus
Rheanne Suszek - Executive Director, North Oakland YMCA
John Waugh - System Vice President, Henry Ford Health System

Mission

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.

General Information

The School of Health Sciences offers degree and non-degree programs in health and medically related fields. Bachelor of Science degree options include Applied Health Sciences, Health Sciences, Environmental Health and Safety, Clinical and Diagnostic Sciences, and Wellness and Health Promotion. Minors are offered in Community Health Engagement, Exercise Science, Environmental Health and Safety, Holistic Health, Nutrition and Health, and Wellness and Health Promotion. The School of Health Sciences offers Master of Science degrees in Exercise Science and in Safety Management and a Master of Public Health degree. The School of Health Sciences also offers both an entry-level Doctor of Physical Therapy degree for students who want to become physical therapists, and a post-professional Doctor of Science in Physical Therapy degree for licensed physical therapists. Graduate certificates are available in orthopedic manual physical therapy, pediatric rehabilitation, orthopedics, neurological rehabilitation, teaching and learning for rehabilitation professionals, clinical exercise science, corporate and worksite wellness, and exercise science at the graduate level.

Continuing education is offered by the School of Health Sciences Center for Professional Development in order to meet the educational needs of health sciences professionals. Specialized contract programs are also provided to meet the unique professional staff development needs of employers in health care, business and industry, government and other settings. Programs are individually tailored to meet the specific workplace needs of professionals and employers. Programs and courses are offered either for university credit or noncredit. When noncredit programs and courses are offered, they carry the nationally recognized Continuing Education Unit (CEU).

Admission to any program offered by the School of Health Sciences 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.

School programs with laboratory and internship components require that physical, cognitive, and psycho-social technical standards be met. Students with disabilities who have questions about meeting these standards are encouraged to contact the Office of Disability Support Services, 103A North Foundation Hall, (248) 370-3266.

High school students considering a major in any of the programs offered by the School of Health Sciences should consult the Admissions section of the catalog for specific preparation requirements.

The academic requirements for each of the baccalaureate programs of the School are described in the pages that follow. The requirements include prerequisite-level course-work that complements each program's core curriculum, the program major course requirements, and the university General Education Requirements and U.S. diversity requirements. Students changing majors are required to follow the program requirements listed in the catalog no earlier than the one in effect at the time of admission to the new program. (A change from pre-major to major standing in the same field does not constitute a change of program).

Students transferring from other universities or colleges to Oakland University must have their transcripts evaluated by the School of Health Sciences to determine which core curriculum or program course-work requirements have been met. See Transfer student information for additional information.

Academic Advising

Professional academic advisers are available to assist students with degree requirements, plans of study, course scheduling, transfer course evaluation, establishing academic goals, health career choices and the process of achieving major standing. The School of Health Sciences academic advising office is located in 1014 Human Health Building. For advising appointments, please call (248) 370-2369. Freshman and transfer orientation is required of all entering students. Undecided health science students should meet with an academic adviser early in their programs of study. Thereafter, students are encouraged to make appointments with an academic adviser periodically to monitor their progress. School of Health sciences faculty members are also available to assist with curriculum and course questions once students are enrolled in health sciences major course work.

To avoid delays in seeing a professional academic adviser, students are encouraged to schedule advising appointments during times other than early registration periods. Academic advisers are here to assist students in planning for their major programs. Ultimately, students are responsible for understanding and fulfilling the degree requirements for graduation as set forth in this catalog.

Approved Minors

School of Health Sciences students may elect to complete a minor in another discipline offering such an option. It is recommended that students who are considering declaring a minor consult as early as possible with the School of Health Sciences academic adviser and the minor field adviser. Credits earned toward a degree in the School of Health Sciences can be counted also toward any minor to which they would otherwise apply that is offered by the other schools or the college.

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.

Petition of Exception

For students enrolled in School of Health Sciences programs, all petitions of exception are completed by the student with assistance from an SHS advisor as needed. The petition must be reviewed by an academic adviser and the appropriate Program Director or Chair (when there is not a Program Director appointed) before referral to the School of Health Sciences Committee on Instruction. See the Academic Policies and Procedures section of the catalog for further information (Petition of exception).

Department of Clinical and Diagnostic Sciences

Human Health Building

433 Meadow Brook Road

Rochester, MI 48309-4452

(248) 370-3562

Chair: *J. Lynne Williams*

Professor: *J. Lynne Williams*

Associate professors: *Sumit Dinda, Kristin Landis-Piwowar*

Assistant professor: *Rebekah Martin*

Adjunct Instructors: *Terese Trost, Bill Van Dyke*

Clinical associate professors: *Barbara Anderson, Ann Marie Blenc, Mohanpal Dulai, Martha J. Higgins*

Clinical instructors: *Sarah Bajer, Lisa DeCeuninck, Scott Emerson, Christina Lim, JoAnne Logue-O'Malley, Laura L. Ochs, Jamie F. Pert, Nancy E. Ramirez, Joyce A. Salancy, Dawn Taylor*

Department of Clinical and Diagnostic Sciences offers programs designed to prepare students for professional opportunities in a variety of settings. Graduates may find employment in hospital or commercial clinical laboratories, research laboratories or public health facilities. Positions within biomedical corporations, including research and development, quality assurance and sales or service may also be prospective sources for employment. Furthermore, because it meets basic academic requirements, the Clinical and Diagnostic Sciences curricula provide excellent preparation for entry into post-baccalaureate professional programs including physician assistant, medicine, dentistry and osteopathy.

Biomedical sciences is a diversified field. In response to new technologies, many areas of specialization have evolved to ensure the expertise of individuals performing the required tasks. As health care professionals, biomedical scientists play an integral part in patient care. Some are involved in detection and diagnosis of disease. Others provide therapy to patients.The Clinical and Diagnostic Sciences Department at Oakland University addresses several specializations including medical laboratory science, histotechnology, nuclear medicine technology, and radiologic technology. Histotechnologists are involved in the diagnosis of disease based on alterations in cells or tissues (anatomic pathology). Medical laboratory scientists perform a wide variety of tests, including chemical, microscopic, bacteriological and immunological procedures used in the diagnosis and study of disease (clinical pathology). Nuclear medicine technologists use small amounts of radioactive materials for diagnostic evaluation of anatomic or physiologic conditions of the body and to provide therapy with radioactive sources. Radiologic technologists utilize ionizing radiation to image internal structures of the body (x-ray and subspecialties).

Generally, employment in a hospital or community clinical laboratory requires certification in a specialization field. Students are eligible to sit for national certification examinations in their specialization upon completion of the appropriate clinical internship at an accredited institution. Professional certification is obtained by successfully passing the examination.

Admission to Specializations

Students may be admitted as Clinical and Diagnostic Sciences majors directly from high school or by transfer from other colleges or universities. As described below (Admission to clinical specialization internship), with the exception of medical laboratory science, students have the option of earning the Clinical and Diagnostic Sciences degree by completing a clinical

specialization internship program. Acceptance into the internship programs is competitive and is based on grade point average, personal interview and letters of recommendation. The application process for each of the specializations is unique. Students are advised to read carefully about their chosen specialization. In some cases it is the policy of the affiliate institution that a criminal background check at the student's expense is required for acceptance into a clinical program.

All students should select their desired area of specialization by the end of sophomore year, as the coursework in the junior year is different for each specialization. They must complete a departmental student profile at this time. The actual acceptance into a student's chosen clinical program (specialization) shall define specialization standing for course prerequisites and professional course requirements. The junior and senior year curricula will vary depending upon the specialization.

Graduation without a Specialization

Students not wishing to pursue professional certification or not accepted by a clinical internship program may complete the Clinical and Diagnostic Sciences degree by following the academic program for the specialization of their choice, and completing the Clinical and Diagnostic Sciences Pre-Professional concentration. Such students may still be eligible to apply for clinical internship opportunities either before or after graduation, if desired.

Schedule of classes

Specific offerings for each semester may be found in the Schedule of Classes.

Programs

- Clinical and Diagnostic Sciences, B.S.

Clinical and Diagnostic Sciences, B.S.

Requirements for the B.S. degree with a major in Clinical and Diagnostic Sciences

Students pursuing specializations in histotechnology, nuclear medicine technology, or radiologic technology must complete a minimum of 136 credits, including the following requirements. Students pursuing the specialization in medical laboratory science or graduating with a Pre-Professional specialization must complete a minimum of 128 credits, including the following requirements.

Pre-Professional program component

1. Meet the university general education requirements (see *General Education Requirements*). Note that several courses under requirement number three below satisfy general education requirements and Clinical and Diagnostic Sciences degree requirements. See courses marked with "*".
2. Complete the university U.S. diversity requirement.
3. Complete the Clinical and Diagnostic Sciences core curriculum.

Professional program

4. Complete the specialization course requirements specified under one of the four Clinical and Diagnostic Sciences specializations (medical laboratory science, histotechnology, nuclear medicine technology, or radiologic technology) **OR** complete course requirements specified under Pre-Professional specialization.
5. Complete all Clinical and Diagnostic Sciences 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)** *
- CHM 1440 - General Chemistry I **(4)** *
- CHM 1470 - General Chemistry Laboratory I **(1)**
- CHM 1450 - General Chemistry II **(4)**
- CHM 1480 - General Chemistry Laboratory II **(1)**
- 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)**

- CDS 2010 - Careers in Biomedical Diagnostic and Therapeutic Sciences **(1)**
- CDS 2050 - Contemporary Issues in Health Care Organizations and Practice **(2)**
- CDS 2100 - Medical Terminology **(1)**
- CDS 2260 - Introduction to Laboratory Theory and Techniques **(2)** (not required for RAD or NMT specialization)
- HS 4500 - Law, Values and Health Care **(4)**
- WRT 1050 - Composition I **(4)** or 4 approved elective credits (not required for NMT specialization)

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 and radiologic technology internship programs are processed in the winter semester of the sophomore year (or Winter semester following completion of the Clinical and Diagnostic Sciences core curriculum). Applications for nuclear medicine internships are processed during the fall or winter semester of the junior year (depending on desired start of clinical program) and applications for the MLS internships are processed during the summer prior to the senior year. It is recommended that students have at least a 3.00 (B) 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 websites for exact application dates.

Grade point policy

Students must maintain a cumulative GPA of 2.8 in all course-work applied to the Clinical and Diagnostic Sciences major. Students in a specialization will be placed on probation if they earn a grade less than C in any course or if their cumulative grade point average in major coursework falls below 2.80. Students who earn a second grade less than C must have their programs reviewed by the faculty to determine remediation or termination from the program.

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

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). Application to clinical internship (if desired) is made during the summer semester prior to the senior year. Internships are between six and ten months in length (depending on the clinical site), and are done post-graduate. Oakland University is affiliated with the following accredited MLS clinical programs: Detroit Medical Center University Laboratories, Detroit; Hurley Medical Center, Flint; St. John Providence Health System, Detroit and William Beaumont Hospital, Royal Oak. **Acceptance into the internship program is competitive and based on grade point average, personal interview, and letters of recommendation.**

Medical laboratory science specialization professional course requirements

Students in the medical laboratory science specialization must complete the following courses:

- PHY 1080 - Principles of Physics I **(4)**
- PHY 1090 - Principles of Physics II **(4)**
- CHM 2340 - Organic Chemistry I **(4)**
- CDS 3140 - Hemostasis **(3)**
- CDS 3350 - Clinical Parasitology/Mycology/Virology **(3)**
- CDS 3360 - Clinical Parasitology/Mycology/Virology Laboratory **(1)**
- CDS 4000 - Medical Genetics **(4)**
- CDS 4020 - Molecular Diagnostics **(3)**
- CDS 4160 - Medical Hematology **(4)**
- CDS 4170 - Hematology Laboratory **(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 4400 - Clinical Correlations **(3)**

And four elective credits from the following courses:

- CDS 4995 - Directed Research **(2 TO 4)**
- CDS 4997 - Apprentice College Teaching **(1 TO 3)**
- CDS 4010 - Human Pathology **(4)**
- EHS 1150 - Environmental Health and Safety at Work **(2)**
- EHS 4450 - Introduction to Ergonomics **(3)**
- PSY 2250 - Introduction to Life-Span Developmental Psychology **(4)**
- HS 2500 - Human Nutrition and Health **(4)**
- HS 3000 - Community and Public Health **(4)**
- HS 4100 - Nutrition and Lifecycles **(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)**
- MTH 1441 - Precalculus **(4)**

- MTH 1554 - Calculus I **(4)**
- CHM 2350 - Organic Chemistry II **(4)**
- PHY 1100 - General Physics Lab I **(1)**
- PHY 1110 - General Physics Lab II **(1)**
- or additional electives as approved.

Note

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

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 in situ hybridization and image analysis, and medical photography. Techniques in education methodology, management, research, technical writing and presentation of scientific information are also included in the curriculum.

Students may apply for specialization standing in histotechnology after completing the Clinical and Diagnostice Sciences core curriculum. Application to the hospital-based internship is typically made during the winter semester of the sophomore year. Students will be informed of acceptance in June and begin the internship in August of the next calendar year. Application for specialization standing and internship usually coincide for histotechnology.

The junior year consists of the prescribed professional course requirements at Oakland University. The senior year consists of a 12-month internship at the William Beaumont Hospital School of Histotechnology. **Acceptance into the internship program is competitive and is based on grade point average, personal interview and letters of recommendation.**

Histotechnology specialization professional course requirements

Students in the histotechnology specialization must complete the following courses

- BIO 3140 - Histology **(4)**

- BIO 3141 - Histology Laboratory **(1)**
- CDS 3120 - Hematology/Cellular Pathophysiology **(3)**
- CDS 3350 - Clinical Parasitology/Mycology/Virology **(3)**
- CDS 3360 - Clinical Parasitology/Mycology/Virology Laboratory **(1)**
- CDS 4000 - Medical Genetics **(4)**
- CDS 4010 - Human Pathology **(4)**
- CDS 4020 - Molecular Diagnostics **(3)**
- CDS 4250 - Medical Biochemistry **(4)**
- CDS 4300 - Clinical Microbiology **(4)**
- 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)**

And nine elective credits from the following courses:

- PSY 2250 Introduction to Life-Span Developmental Psychology **(4)**
- HS 2500 Human Nutrition and Health **(4)**
- HS 3000 Community and Public Health **(4)**
- HS 4010 Pharmacology **(2)**
- CDS 4929 Directed Readings **(1 TO 4)**
- MTH 1441 Precalculus **(4)**
- MTH 1554 Calculus I **(4)**
- PHY 1080 Principles of Physics I **(4)**
- PHY 1090 Principles of Physics II **(4)**
- BIO 1300 Biology II **(4)**

- BIO 4620 Advanced Human Physiology **(4)**
- BIO 4622 Endocrinology **(4)**
- EHS 1150 Environmental Health and Safety at Work **(2)**
- EHS 4450 Introduction to Ergonomics **(3)**
- WHP 3250 Issues in Women's Health **(4)**

  or additional electives as approved.

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.

The Nuclear Medicine 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. Oakland students will need to apply to be guest students at the University of Findlay while they are in the Nuclear Medicine program, and will 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. **Acceptance into the internship program is competitive and based on grade point average, personal interview and letters of recommendation.**

Nuclear medicine technology specialization professional course requirements

Students in the nuclear medicine technology specialization must complete the following courses:

- COM 2000 - Public Speaking **(4)**
- CDS 3120 - Hematology/Cellular Pathophysiology **(3)**
- CDS 4010 - Human Pathology **(4)**
- MTH 1441 - Precalculus **(4)**
- PHY 1080 - Principles of Physics I **(4)**
- PHY 1090 - Principles of Physics II **(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)**

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.

Students may apply for admission into the Radiologic Technology specialization after completing the Clinical and Diagnostic Sciences core curriculum requirements. Radiologic Technology is currently the only Clinical and Diagnostic Sciences specialization for which Oakland University holds the programmatic accreditation. The admission process occurs during Winter semester prior to the August start date of each year. **Acceptance into the program is competitive and is based on grade point average, personal interview and letters of recommendation.** Applicants are required to have a minimum grade of 3.0 (B) cumulative total GPA and science GPA, and 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 junior and senior years consist of didactic work at Oakland University and supervised clinical experience in the Radiologic Technology Department at William Beaumont Hospital.

Radiologic technology specialization professional course requirements

Students in the radiologic technology specialization must complete the following courses:

- 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)**

Pre-professional studies for medicine, dentistry, physician assistant, 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. The curricula for some CDS specializations may require additional courses, depending on the individual professional program requirements. For a student desiring greater flexibility in planning their academic program, the Pre-Professional concentration 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-Professional Specialization course requirements

Students in the Pre-Professional Specialization must complete the following courses:

- 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 2340 - Organic Chemistry I **(4)**
- CHM 2350 - Organic Chemistry II **(4)**
- CHM 2370 - Organic Chemistry Laboratory **(2)**
- CDS 3120 - Hematology/Cellular Pathophysiology **(3)** or CDS 4160 Medical Hematology **(4)**
- CDS 4000 - Medical Genetics **(4)**
- 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 (20-21 credits) from the following courses:

- CDS 3350 Clinical Parasitology/Mycology/Virology **(3)** & CDS 3360 Clinical Parasitology/Mycology/Virology Laboratory **(1)**
- CDS 4010 Human Pathology **(4)**
- CDS 4020 Molecular Diagnostics **(3)**
- CDS 4270 Clinical Chemistry **(4)** & CDS 4280 Clinical Chemistry Laboratory **(1)**
- CDS 4400 Clinical Correlations **(3)**
- CDS 4929 Directed Readings **(1 TO 4)**

- CDS 4995 Directed Research **(2 TO 4)**
- MTH 1441 Precalculus **(4)**
- MTH 1554 Calculus I **(4)**
- PSY 2250 Introduction to Life-Span Developmental Psychology **(4)**
- HS 2500 Human Nutrition and Health **(4)**
- HS 3000 Community and Public Health **(4)**
- HS 4100 Nutrition and Lifecycles **(4)**
- EHS 1150 Environmental Health and Safety at Work **(2)**
- EHS 4450 Introduction to Ergonomics **(3)**
- EXS 3010 Exercise Physiology **(3)**
- EXS 3015 Exercise Physiology Laboratory **(1)**
- BIO 3140 Histology **(4)** & 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)**
- SW 3101 Human Behavior and Social Environment **(4)**/ SW 3201 Human Behavior and Social Environment **(4)**
- WHP 3250 Issues in Women's Health **(4)**

  or additional electives as approved.

Courses

CDS 2010 - Careers in Biomedical Diagnostic and Therapeutic Sciences (1)

An introductory seminar in biomedical diagnostic and therapeutic sciences, including career opportunities in clinical settings (medical laboratory science, histotechnology, nuclear medicine technology, radiologic technology, physician assistant, and medical doctor), industrial sales and/or research and development, basic medical research and education. Offered fall semester.

CDS 2050 - Contemporary Issues in Health Care Organizations and Practice (2)
An understanding of laboratory and health care organizations and issues to prepare students as professional practitioners to function effectively in a rapidly changing environment. Offered fall and summer semesters.

CDS 2100 - Medical Terminology (1)
This course is designed as an independent study using a programmed text. Initial emphasis is on learning Greek and Latin word parts and rules for combining them, with cumulative study directed to the analysis and definition of medical terms. Offered fall, winter, and summer semesters.

CDS 2260 - Introduction to Laboratory Theory and Techniques (2)
Basic concepts and principles in the practice of clinical laboratory science. Integration of principles of phlebotomy, microscopy, laboratory mathematics, spectrophotometry, and laboratory safety. Offered fall, winter semesters.
Prerequisite(s): CHM 1440 and CHM 1470

CDS 3120 - Hematology/Cellular Pathophysiology (3)
Topics include current concepts of hematopoiesis, including selected topics in red blood cell, white blood cell and platelet morphogenesis, physiology and pathophysiology; an introduction to the basic principles involved in cellular disease mechanisms. Offered fall semester.
Prerequisite(s): BIO 2600 with a (C) or instructor permission.

CDS 3140 - Hemostasis (3)
In depth study of the basic physiology and pathophysiology of the human hemostatic system, including the role of the vasculature, platelets and plasma proteins. Laboratory included. Offered fall semester.
Prerequisite(s): BIO 2600 with a (C) and CDS 2260 with a (B-) and permission of instructor.

CDS 3350 - Clinical Parasitology/Mycology/Virology (3)
Introduction to clinical parasitology, mycology and virology. Included are: morphology, life cycles, reproduction, classification and diseases in humans. Offered winter semester.
Prerequisite(s): BIO 1200 and CDS 2260

CDS 3360 - Clinical Parasitology/Mycology/Virology Laboratory (1)
Laboratory to accompany CDS 3350. Includes basic parasitology and mycology isolation and identification procedures such as staining, and macroscopic and microscopic observations. Also includes very basic rapid virology diagnostic techniques. Offered winter semester.
Prerequisite(s): BIO 1200 and CDS 2260
Corequisite(s): CDS 3350

CDS 4000 - Medical Genetics (4)
The course will discuss the molecular nature and inheritance patterns of genes. Classical genetics and the cause and diagnosis of disease at the molecular level will be detailed. Offered fall semester.
Prerequisite(s): BIO 2600 with a (C)

CDS 4010 - Human Pathology (4)
Basic principles of human pathology appropriate for students pursuing curricula in the health-related disciplines. Diseases of the major systems of the body are studied. Credit will not be granted for both CDS 4010 and CDS 5000. Cross-listed with CDS 5000.
Prerequisite(s): BIO 1200, BIO 2100, and (BIO 2600 or BIO 3620) with grade of D (1.0) or better.

CDS 4020 - Molecular Diagnostics (3)
Discussion of diagnosis of disease on a molecular level including current molecular diagnostic techniques and procedures, and correlation with clinical conditions. Laboratory included. Offered winter semester.
Prerequisite(s): CDS 2260 with a (B-) and CDS 4000 with a (C)

CDS 4160 - Medical Hematology (4)
Theory and techniques in hematology, including red blood cell, white blood cell, and platelet morphogenesis, physiology, and pathophysiology. Offered winter semester.
Prerequisite(s): BIO 2600 with a (C)
Corequisite(s): CDS 4170

CDS 4170 - Hematology Laboratory (1)
To accompany CDS 4160. Offered winter semester.
Prerequisite(s): CDS 2260 with a (B-)
Corequisite(s): CDS 4160

CDS 4230 - Medical Immunology (3)
An introduction to the principles and practices of immunology with emphasis on cellular and molecular interactions, using an experimental approach. This course will include the normal

immune responses and clinical conditions, including autoimmunity, immunodeficiency, hypersensitivity disorders and transplant rejection. Offered winter and spring semester.
Prerequisite(s): BIO 2600 with a (C)

CDS 4240 - Immunohematology (3)
Discussion of the immunologic and genetic basis for the study of red cell antigen/antibody systems, including physiologic and pathophysiologic consequences of foreign antigen exposure. Offered fall semester.
Prerequisite(s): BIO 2600 with a (C), CDS 2260 with a (B-), and CDS 4230 with a (C) or instructor permission.
Corequisite(s): CDS 4241

CDS 4241 - Immunohematology Laboratory (1)
Laboratory designed to familiarize the student with basic skills utilized in the immunohematology laboratory. Emphasis is placed upon knowledge of laboratory principles, development of laboratory skills, interpretation of results, organizational techniques, accuracy of laboratory testing, and development of problem solving skills. Offered fall semester.
Prerequisite(s): BIO 2600 with a (C), CDS 2260 with a (B-), and CDS 4230 with a (C) or instructor permission.
Corequisite(s): CDS 4240

CDS 4250 - Medical Biochemistry (4)
An integrated approach to human biochemistry stressing metabolic interrelationships. Topics covered include: structure and function of proteins, carbohydrates and lipids; enzyme mechanisms and regulation; metabolic pathways and control; nucleic acid structure, function and processing; regulation of gene expression; intracellular and extracellular signal transduction. Offered fall and summer semesters.
Prerequisite(s): BIO 2600 or CHM 1450 and CHM 1480

CDS 4270 - Clinical Chemistry (4)
A theoretical introduction to the fundamentals of clinical chemistry, with emphasis on pathophysiology and clinical correlations. To include an introduction to theoretical and practical aspects of relevant instrumentation and methods of clinical analysis. Offered fall semester.
Prerequisite(s): BIO 2600 with a (C), and CDS 4250 with a (C) or instructor permission.

CDS 4280 - Clinical Chemistry Laboratory (1)
Provides practical experience in the application of clinical instrumentation and current clinical methodologies to the performance of clinical chemistry assays. Offered fall semester.

Prerequisite(s): CDS 2260 with a (B-)
Corequisite(s): CDS 4270

CDS 4300 - Clinical Microbiology (4)
Provides a background in basic medical microbiology, including the morphology, cultivation, identification and control of microorganisms. Offered summer and fall semesters.
Prerequisite(s): BIO 1200

CDS 4310 - Clinical Microbiology Laboratory (1)
Laboratory to accompany CDS 4300. Includes basic microbiological procedures such as aseptic technique, isolation, cultivating, biochemical characteristics and staining of selected microbes, with regard to their importance in the diagnosis of human diseases. Offered summer and fall semesters.
Prerequisite(s): CDS 2260
Corequisite(s): CDS 4300

CDS 4320 - Medical Microbiology Laboratory (1)
Laboratory for non-CLS majors to accompany CDS 4300. Includes basic microbiological procedures such as aseptic technique, isolation, cultivation, biochemical characteristics, and staining of selected microbes, with regard to their importance in human diseases. Offered summer and fall semesters.
Corequisite(s): CDS 4300

CDS 4400 - Clinical Correlations (3)
A problem-solving, multidisciplinary, case-study-based course which integrates material from the various clinical laboratory science disciplines. The course utilizes critical-thinking exercises to interpret data across disciplines, correlating results to disease problem-solving and quality assurances. Offered winter semester.
Prerequisite(s): CDS 4240, CDS 3140, CDS 4270, CDS 4160, and CDS 4300

CDS 4900 - Special Topics (1 TO 4)
May be repeated for additional credit.
Prerequisite(s): permission of instructor.

CDS 4929 - Directed Readings (1 TO 4)
Student initiated and problem-oriented directed study focusing on medical laboratory science issues. May be repeated for additional credit.
Prerequisite(s): program permission.

CDS 4995 - Directed Research (2 TO 4)
May be repeated for additional credit.
Prerequisite(s): permission of instructor.

CDS 4997 - Apprentice College Teaching (1 TO 3)
Directed teaching of selected undergraduate courses. May be repeated for a maximum of 4 credits. Graded S/U.
Prerequisite(s): permission of instructor.

CT 4950 - Clinical Internship (12)
Microscopic study of cellular alterations indicative of cancer and precancerous lesions, infections and benign conditions in the female genital tract; introduction to cytopreparatory techniques.
Prerequisite(s): cytotechnology specialization standing.

CT 4951 - Clinical Internship (12)
Continuation of CT 4950; microscopic study of non-gynecologic samples and fine needle aspirations; laboratory rotations; research project.
Prerequisite(s): cytotechnology specialization standing.

HT 4010 - Basic Histotechnique and Histochemical Staining Methods (12)
Didactic and practicum experience in preparing histologic sections for light microscopy, including the study of over 50 different histologic and enzyme histochemical staining methods and their specific applications.
Prerequisite(s): Histotechnology specialization standing.

HT 4020 - Basic Electron Microscopy (3)
Didactic and practicum experience in basic biological electron microscopy. Electron microscopic histochemistry and special techniques are also covered. Emphasis is on the electron microscope as a medical diagnostic tool.
Prerequisite(s): Histotechnology specialization standing.

HT 4030 - Immunohisto-Cytochemistry (5)
Didactic and practicum experience in basic and advanced procedures of fluorescent and enzyme-labeled antibody techniques. Includes the preparation of tissues, staining with labeled antibodies and the use of the fluorescence microscope in clinical medicine and research.
Prerequisite(s): Histotechnology specialization standing.

HT 4040 - Special Techniques (4)
Didactic and practicum experience in molecular pathology (in situ hybridization and DNA analysis), management, education methodology, technical writing and research techniques. Prerequisite(s): Histotechnology specialization standing.

NMT 4950 - Clinical Internship I (12)
Didactic and clinical experience in clinical nuclear medicine including instrumentation, radio pharmacy, ligand assay, organ imaging and therapy with radionuclides.
Prerequisite(s): program permission.

NMT 4951 - Clinical Internship II (12)
Continuation of NMT 4950

NMT 4952 - Clinical Internship III (8)
Continuation of NMT 4951

RAD 3110 - Methods of Patient Care I (2)
An overview of patient care procedures for medical imaging. Topics include infection control, sterile technique, vital body signs, immobilization, body mechanics and patient transport, routine and emergency patient care procedures and the purpose and radiographic identification of tubes/lines. Restriction(s): RAD specialization standing.

RAD 3310 - Radiologic Physics I (3)
The principles of atomic theory, x-ray production and generation, and the characteristics of x-rays. The entire x-ray circuit is covered, as well as the function of the circuits' individual components. Basic electronics, electrostatics, magnetism, the structure of matter, etc. are covered. Restriction(s): RAD specialization standing.

RAD 3330 - Principles of Radiographic Exposure I (3)
This course covers the principles of x-ray and image receptor exposure. Topics include: Introduction to image quality factors, attenuation, radiation protection and digital imaging. Restriction(s): RAD specialization standing.

RAD 3340 - Principles of Radiographic Exposure II (2)
Continued focus on image formation and image receptor exposure. Topics include factors affecting image quality, exposure conversion formulas and digital image receptors. Restriction(s): RAD specialization standing.

RAD 3410 - Radiographic Procedures I (4)

An introduction to radiographic positioning, terminology and procedures. Instruction in radiographic anatomy, positioning and pathology of chest, abdomen, upper extremity and lower extremity. Restriction(s): RAD specialization standing.

RAD 3420 - Radiographic Procedures II (2)
Instruction in radiographic anatomy, positioning and pathology of the bony pelvis, bony thorax and entire spine. Restriction(s): RAD specialization standing.

RAD 3430 - Radiographic Procedures III (2)
Instruction in the radiographic anatomy, positioning and pathology of the gastrointestinal and urinary systems. Restriction(s): RAD specialization standing.

RAD 3450 - Radiographic Image Evaluation I (2)
An in-depth study of radiographic images, focusing on critique of images regarding recommended standard evaluation criteria. Restriction(s): RAD specialization standing.

RAD 4070 - Radiation Biology and Protection (2)
Overview of the principles of radiation interactions with living organisms. Early and late effects of radiation exposure are discussed. Methods to limit occupational and patient exposures are covered. Restriction(s): RAD specialization standing.

RAD 4110 - Methods of Patient Care II (1)
Examination of medical emergencies, radiographic contrast material and pharmacology. Venipuncture and medication safety are included. Restriction(s): RAD specialization standing.

RAD 4310 - Radiologic Physics II (3)
Topics include physics of computed radiography, digital radiography, digital image processing, mammography, fluoroscopy, computed tomography, ultrasound, and magnetic resonance imaging. Restriction(s): RAD specialization standing.

RAD 4330 - Principles of Radiographic Exposure III (2)
Focus on fluoroscopy, tomography and foundation principles related to digital imaging. Restriction(s): RAD specialization standing.

RAD 4340 - Principles of Radiographic Exposure IV (3)
Focus on the application of technical exposure principles to the digital aspect of radiographic image production, processing, and analysis. Elements of a radiology quality assurance program with specific equipment testing methods are presented. Restriction(s): RAD specialization standing.

RAD 4410 - Radiographic Procedures IV (3)
Instruction in radiographic anatomy, positioning and pathology of the skull, sinuses, facial bones, nasal bones and mandible. Includes exploration of trauma, mobile, surgical, and pediatric radiography. Restriction(s): RAD specialization standing.

RAD 4420 - Radiographic Procedures V (3)
Instruction in advanced radiographic procedures. Topics include special positions and procedures; sectional anatomy; research/presentation of an imaging topic of continued professional education. Restriction(s): RAD specialization standing.

RAD 4440 - Medical Imaging Practices (4)
Examination of current medical imaging practices in a variety of specialties. Emphasis is on patient care, safety, imaging principles and imaging procedures. Restriction(s): RAD specialization standing.

RAD 4801 - Computed Tomography (6)
This course provides the student with clinical experiences and didactic education in the essential elements of computed tomography in preparation for the post-primary certification. This course is an in-depth study of patient safety, equipment operation, imaging methodology and pathologic considerations. Instructors Permission required.

RAD 4802 - Interventional Radiology (6)
This course provides the student with clinical experiences and didactic education in the essential elements of interventional radiology in preparation for the post-primary certification. This course is an in-depth study of patient safety, equipment operation, imaging methodology and pathologic considerations. Instructor's permission required.

RAD 4803 - Magnetic Resonance Imaging (6)
This course provides the student with clinical experiences and didactic education in the essential elements of magnetic resonance imaging in preparation for the post-primary certification. This course is an in-depth study of patient safety, equipment operation, imaging methodology and pathologic considerations. Instructors Permission required.

RAD 4804 - Mammography (6)
This course provides the student with clinical experiences and didactic education in the essential elements of mammography in preparation for the post-primary certification. This course is an in-depth study of patient safety, equipment operation, imaging methodology and pathologic considerations. Instructors Permission required.

RAD 4960 - Clinical Practicum I (3)
Student will gain hands-on experience and begin to achieve competency in basic radiographic procedures under the supervision and guidance of registered technologists.
Prerequisite(s): program permission.

RAD 4961 - Clinical Practicum II (3)
Continuation of RAD 4960. Increased participation and performance is expected. Restriction(s): RAD specialization standing.

RAD 4962 - Clinical Practicum III (3)
Continuation of RAD 4961. Increased participation and performance is expected. Emphasis on progression of competency and professional development. Restriction(s): RAD specialization standing.

RAD 4963 - Clinical Practicum IV (3)
Continuation of RAD 4962. Emphasis is placed on increased competence and confidence in the development of personal routine practices. Restriction(s): RAD specialization standing.

RAD 4964 - Clinical Practicum V (3)
Continuation of RAD 4963. Opportunities are provided in general radiography and advanced imaging modalities. Emphasis is placed on increased competence and confidence in the development of personal routine practices. Restriction(s): RAD specialization standing.

RAD 4965 - Clinical Practicum VI (3)
Continuation of RAD 4964. Opportunities are provided in general radiography and advanced imaging modalities. Focus is on performing at entry-level. Restriction(s): RAD specialization standing.

RAD 4970 - Senior Seminar (2)
This course covers emerging technologies, special radiography and career topics. Topics include: preparation for credentialing in radiography, credentialing exam strategies, review of specific credentialing topic areas. Simulated credentialing exams and student specific results are reviewed. Restriction(s): RAD specialization standing.

Department of Human Movement Science

Human Health Building

433 Meadow Brook Road

Rochester, MI 48309-4452

(248) 370-3562

Chairperson: *Kristine A. Thompson*

Exercise Science Director: *Charles R.C. Marks*

Physical Therapy Director: *John R. Krauss*

Professors Emeritus: *Alfred W. Stransky, Robert W. Jarski*

Professor: *John R. Krauss*

Associate professors: *R. Elizabeth Black, Douglas S. Creighton, Deborah J. Doherty, Jacqueline S. Drouin, Daniel Goble, Tamara D. Hew-Butler, Melodie D. Kondratek, Charles R. C. Marks*

Assistant professor: *Sara Arena, Myung D. Choi, Christopher Wilson*

Special instructors: *Christine Stiller, Kristine A. Thompson*

Adjunct Assistant Professor: *Sheri Brown*

Visiting Instructor: *Jacqueline Scully*

Clinical professors: *Barry A. Franklin, Steven J. Keteyian, Beth C. Marcoux*

Clinical associate professor: *John F. Kazmierski*

Adjunct assistant professor: *Scott Eathorne*

Clinical assistant professors: *Johnathan Ehrman, Cathy A. Larson, Frederick D. Pociask,*

Senior clinical instructors: *Robert S. Burns, Jamie Janes, David A. Tomsich*

Clinical instructors: *Kathleen Jakubiak Kovacek, Peter R. Kovacek, Terry Dibble, Sheldon Levine, Mary Anne Mikus, Janet Siedel, Michael Vito*

The Exercise Science program offers elective courses for students interested in the relationship among physical activity, weight control, disease prevention, stress management and nutrition for optimal health and 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.

Students can complete a baccalaureate degree in Health Sciences with an Exercise Science academic concentration. See Health Sciences Program in this section of the catalog. For a description of the Master of Science in exercise science program, see the Oakland University Graduate Catalog.

The School of Health Sciences offers a curricular program for students interested in pre-physical therapy. For more information see the requirements for the B.S. in Health Sciences, pre-physical therapy academic concentration. The pre-physical therapy focus is designed to prepare students for the traditional application requirements for the Oakland University Doctor of Physical Therapy (DPT). The program offers selected courses from this catalog as warranted by student needs and availability of faculty.

Schedule of classes

Specific offerings for each semester may be found in the Schedule of Classes.

Programs

- Exercise Science Minor

Exercise Science Minor

A 22-credit minor in Exercise Science is available to students in any degree program seeking a formal introduction to the exercise science field. An undergraduate degree focusing on Exercise Science may be designed by including this minor in a Bachelor of Science in Wellness and Health Promotion, a Bachelor of Integrative Studies, or a Bachelor of Science in Health Sciences plan of work.

Courses required for the minor include

- HS 2000 - Health in Personal and Occupational Environments **(4)**
- EXS 2400 - Weight Control, Nutrition and Exercise **(4)**
- EXS 3010 - Exercise Physiology **(3)** *
- EXS 3015 - Exercise Physiology Laboratory **(1)** *
- EXS 3020 - Human Motion Analysis **(4)** *

and 6 credits from the following 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 2200 - Introduction to Exercise Science **(2)**
- EXS 2700 - Safety and First Aid in Exercise Settings **(2)** *
- EXS 3030 - Motor Control **(3)**
- 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 4600 - Health and Disease **(2)**

- EXS 4620 - Clinical Biomechanics **(2)**
- EXS 4630 - Basic Athletic Training **(2)**
- EXS 4640 - Exercise Electrocardiography **(2)**
- EXS 4700 - Corporate and Worksite Wellness Programs **(2)**
- EXS 4715 - Integrated Laboratory in Exercise Science **(3)**
- EXS 4800 - Exercise Endocrinology **(2)**
- EXS 4900 - Special Topics **(1 TO 4)**
- EXS 4995 - Directed Study and Research **(1 TO 4)** (2 credits maximum)
- HS 2150 - Stress Management **(3)**
- WHP 3170 - Advanced First Aid/CPR Instruction **(2)**
- WHP 3600 - Wellness Facilitation **(4)**
- WHP 4200 - Injury Prevention and the Environment **(4)**

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.

Courses

EXS 1000 - Exercise (Strength Training) and Health Enhancement (2)
Examination of lifestyle factors related to disease prevention and improved quality of life. Combines regular strength training exercise and health enhancement lectures. Offered all semesters.

EXS 1100 - Cardiovascular Fitness Training (2)
Examination of lifestyle factors related to disease prevention and improved quality of life. Combines exposure to walking-jogging exercise, aerobics exercise, standard cardiovascular training equipment, swimming exercise and health enhancement lectures. Offered all semesters.

EXS 1200 - Exs(Jogging) Hlth Enhance (2)

Jogging

EXS 1300 - Exs(Swimming) Hlth Enhance (2)
Swimming

EXS 1400 - Exs(Aerobics) Hlth Enhance (2)
Aerobics

EXS 1500 - Exercise (Judo) and Health Enhancement (2)
Impact of judo exercise on fitness, weight management, and general wellness. Emphasis on how the body, particularly cardiovascular systems and muscles, responds to judo training, and learning simple biomechanics of the sport. Recommended for students wishing to learn judo and understand exercise science principles in a practical, real life setting.

EXS 2000 - Group Exercise Instruction I (2)
Theory and practice of safe and effective exercise instruction for individual and group resistance training programs. Excellent preparation for personal training. Focus on program design, practical skills of exercise instruction, progression, effective communication, facilities and equipment, legal issues, and risk management. Summer semester.
Prerequisite(s): EXS 1000 or instructor permission.

EXS 2100 - Group Exercise Instruction II (2)
Theory and practice of safe and effective exercise instruction for group aerobic exercise training programs. Focus on training class styles and formats, practical skills of exercise instruction, progression, cueing, pattern building, choreography, and learning styles including visual, kinesthetic and auditory. Land-and water-based programs. Summer semester.
Prerequisite(s): EXS 1100, EXS 2000 or instructor permission.

EXS 2200 - Introduction to Exercise Science (2)
Introduction to the basic concepts from different areas of exercise science (e.g. motor learning, exercise physiology, biomechanics). Offered summer semester.

EXS 2400 - Weight Control, Nutrition and Exercise (4)
Exploration of the role of exercise and optimal nutrition in weight control/loss. Emphasis on effective eating, energy balance, physiology of weight loss, behavior modification and health risks of obesity. Includes practical laboratory experiences. Recommended for students wishing to develop successful weight loss/control skills and improved nutritional habits. Fall, winter and summer semesters.

EXS 2700 - Safety and First Aid in Exercise Settings (2)
Learn how to recognize emergencies, make first aid decisions, and provide immediate, temporary care of accident or sudden illness victims. Healthy living in injury/illness prevention. Use of an Automatic External Defibrillator Basic Life Support (BLS) for the Healthcare Provider (American Heart Association) Certification and First Aid Certification upon successful completion.

EXS 3010 - Exercise Physiology (3)
Effects of exercise and physical training on the physiological systems of the body, with emphasis on cardio-respiratory systems. Includes muscle contraction mechanisms, circulatory and respiratory adjustment during exercise, and nutrition for physical activity.
Prerequisite(s): BIO 1200 and BIO 2600
Corequisite(s): EXS 3015

EXS 3015 - Exercise Physiology Laboratory (1)
Laboratory experiences are provided for insight into the dynamics of human movement from research and clinical perspectives.
Prerequisite(s): BIO 1200 and BIO 2600
Corequisite(s): EXS 3010

EXS 3020 - Human Motion Analysis (4)
The anatomical kinesiology and the mechanical bases of human movement in daily life, exercise rehabilitation, sport, and work settings are analyzed. *Satisfies the university general education requirement for a writing intensive course in general education or the major, not both. Satisfies the university general education requirement for the capstone experience. Prerequisite for writing intensive: completion of the university writing foundation requirement.*
Prerequisite(s): BIO 2100

EXS 3030 - Motor Control (3)
The study of how the nervous and muscular systems coordinate body movements and become skilled with basic and advanced movements.
Prerequisite(s): BIO 2600

EXS 4100 - Introduction to Personal Training (2)
An introduction to the concepts used in personal training. Covers theoretical knowledge and practical skills needed to prepare for a national certification exam in personal training. Topics include exercise testing, prescription, and leading, progression, individualization, goal-setting, logistics, client motivation, safety health promoting behaviors and effective communication.

Cross list with EXS 5100. Offered summer semester.
Prerequisite(s): EXS 1000, EXS 3010, EXS 3015, EXS 3020

EXS 4110 - Advanced Personal Training (2)
Theoretical knowledge and practical skills in advanced personal training including training for special cases: high-performance athletes, musculoskeletal injuries, wheel-chair bound clients, chronic diseases, the elderly, and children. Periodization, plyometrics, exercise with specialized equipment, innovative use of available resources, and best practices for commercial success also covered. Cross list with EXS 5110. Offered summer semester.
Prerequisite(s): EXS 4100

EXS 4200 - Physical Activity and Aging (2)
The effects of aging on physical work capacity, body composition, and cardiovascular, pulmonary, neuromuscular and musculoskeletal function. The principles for prescribing and conducting physical conditioning programs to retard the aging process are included. Cross list with EXS 5200. Offered summer term.
Prerequisite(s): EXS 3010 and EXS 3020

EXS 4210 - Children and Exercise (2)
Physical activity and the growth, maturation, motor development, and motor learning of children from birth through adolescence. Skill and performance enhancement, exercise program design, biomechanics, and injury and disease prevention are discussed. Cross list with EXS 5210. Offered summer term in odd-numbered years.
Prerequisite(s): EXS 3010 and EXS 3020

EXS 4300 - Human Performance Enhancement (2)
Advanced topics and trends in modern strength and conditioning program design and implementation. Topics include muscle physiology, neuromuscular physiology, performance, profiles, periodization, and the theory behind developing adequate strength, mass, flexibility, power, and stability programs. Credit will not be awarded for both EXS 4300 and EXS 5300. Cross list with EXS 5300.
Prerequisite(s): EXS 1000 or instructor permission.

EXS 4310 - Environment and Human Performance (2)
Human adaptation to major factors that can significantly influence human movement in diverse micro- and macro-environments, including temperature, altitude, precipitation, light, noise and socio-cultural factors. Cross list with EXS 5310.
Prerequisite(s): EXS 3010

EXS 4320 - Prevention of Injury and Sudden Death in Sport and Physical Activity (2)
An examination of unintentional traumatic, non-fatal injuries; plus fatal catastrophic injuries in the athletic population; including epidemiology, etiology, risk factors, prevention, pathophysiology, recognition, assessment, intervention, recovery and return to play factors. Equivalent to WHP 4320.
Prerequisite(s): WRT 1060 and HS 2000 or instructor permission.

EXS 4400 - Obesity and Physical Activity (2)
Obesity is a complex disease with myriad contributing factors. This course addresses the causes, prevention, and treatment of obesity, with particular emphasis on the role of physical activity. Metabolism, energy balance, and social, psychological, mechanical, and behavioral issues are discussed. Cross list with EXS 5400.
Pre/Corequisite(s): EXS 3010

EXS 4500 - Healthy Lifestyle Choices (2)
A biopsychosocial approach to exercise and other healthy lifestyle choices. Focus is on the dimensions of wellness, factors influencing lifestyle choices, the theory and practice of behavior change, and health promotion concepts. Cross list with EXS 5500.
Prerequisite(s): PHY 1100, EXS 2400; or EXS 3010 or HS 2000

EXS 4600 - Health and Disease (2)
Examination of the health and medical record with a focus on the history, physical exam, and laboratory and imaging studies. The pathogenesis of representative diseases that are lifestyle related are emphasized. Credit will not be granted for both EXS 4600 and EXS 5600. Cross list with EXS 5600. Offered summer semester.
Prerequisite(s): BIO 1200 and BIO 2600 or instructor permission. BIO 2100 recommended.

EXS 4620 - Clinical Biomechanics (2)
The pathomechanics of the human musculoskeletal system. Topics include properties of human tissue, mechanisms of injury, pathokinesiology, and principles of musculoskeletal exercise prescription. Credit will not be granted for both EXS 4620 and EXS 5620. Cross list with EXS 5620.
Pre/Corequisite(s): EXS 3020

EXS 4630 - Basic Athletic Training (2)
Course directed to competitive sports and the recognition and immediate care of athletic injuries. Evaluation and treatment procedures and techniques are presented and practiced. Identical with PT 4630. Cross list with EXS 5630.
Prerequisite(s): BIO 2100, BIO 2600, EXS 3020

EXS 4640 - Exercise Electrocardiography (2)
Theoretical and applied concepts of resting and exercise electrocardiography (ECG), the normal ECG, and factors contributing to abnormal ECG. Students experience exercise test applications of the ECG and learn to recognize life-threatening arrhythmias. Cross list with EXS 5640. Offered summer semester.
Prerequisite(s): EXS 3010

EXS 4700 - Corporate and Worksite Wellness Programs (2)
Concepts underlying corporate and worksite health promotion programs, including: health and exercise program planning, facility planning and design, program management, staffing, equipment selection, safety and legal issues, and marketing. Cross list with EXS 5700. Offered summer semester.
Prerequisite(s): EXS 3010 or instructor permission.

EXS 4715 - Integrated Laboratory in Exercise Science (3)
This course has three main objectives: 1) Provide students experience with equipment and measurements in exercise science; 2) Integrate core courses in a laboratory setting; 3) Engage in appropriate communication of laboratory work through writing and speaking based on the different formats of scientific reporting as practiced in exercise science.
Prerequisite(s): EXS 3010 (C+) and EXS 3020 (C+)
Corequisite(s): EXS 3030 or instructor permission.

EXS 4800 - Exercise Endocrinology (2)
A cellular and systems physiology approach to human hormone function during exercise. Interaction of neuro-endocrine responses during exercise and body fluid regulation, hemostasis, the immune system, regulation of fuel use, biological rhythms, reproductive cycles, analgesia, and tissue repair. Hormones as ergogenic aids. Cross list with EXS 5800.
Prerequisite(s): BIO 2600 and EXS 3010 or have permission of instructor.

EXS 4810 - Physical Activity Epidemiology (2)
Explores the evolution of epidemiology and its impact on physical activity choices and guidelines. Topics will include the role of physical activity in the primary, secondary and tertiary prevention of chronic disease, mental health problems, and disability from an epidemiologic perspective. Offered Summer semester. Cross list with EXS 5810.
Prerequisite(s): STA 2220 or PSY 2510

EXS 4900 - Special Topics (1 TO 4)

An advanced course involving study of current topics in the practical application of exercise principles. Topics vary. May be repeated for additional credit.
Prerequisite(s): program director permission.

EXS 4960 - Practicum in Exercise Science (5)
Supervised exercise science experience in a program-approved setting with application of HS/EXS and general education knowledge. Students demonstrate exercise science competencies, keep a daily journal, write a critical analysis of the experience, and successfully pass site supervisor evaluation. *Satisfies the university general education requirement for the capstone experience. All semesters.*
Prerequisite(s): HS 2000, EXS 3010, EXS 3020, completion of general education knowledge foundation courses, and EXS program director permission.

EXS 4995 - Directed Study and Research (1 TO 4)
Special study areas and research in exercise science. May be repeated for additional credit. Offered every semester.
Prerequisite(s): program permission.

PT 3020 - Physical Therapy as a Profession (2)
A course for students who are considering a career in physical therapy. Students will examine professional development, behavior and roles in physical therapy clinical, academic and research settings. The current practice of physical therapy in various settings is covered.
Prerequisite(s): Junior Standing.

PT 4630 - Basic Athletic Training (2)
Course directed to competitive sports and the recognition and immediate care of athletic injuries. Evaluation and treatment procedures and techniques are presented and practiced. Identical with EXS 4630. Cross list with EXS 5630.
Prerequisite(s): EXS 3020, BIO 2600, and BIO 2100

PT 4920 - Directed Study (1 TO 4)
Student initiated and problem-oriented directed study focusing on physical therapy issues. May be repeated for additional credit. Graded numerically or S/U.
Prerequisite(s): program permission.

Department of Interdisciplinary Health Sciences

Human Health Building

433 Meadow Brook Road

Rochester, MI 48309-4452

(248) 370-3562

Department Chairperson: *Jennifer F. Lucarelli, Ph.D.*

Professors Emeritus: *Kenneth R. Hightower, Ronald E. Olson, Philip Singer*

Associate professors: *Jennifer F. Lucarelli, Christina Papadimitriou*

Assistant professors: *Amanda Lynch, Melissa Reznar, Laurel Stevenson*

Clinical professors: *Craig Hartrick, Moon J. Pak*

Clinical associate professor: *Joseph H. Guettler*

Clinical instructors: *Sarah Hojnacki, Maureen Husek, Barbara Main, Donna Morrison, Jeanne Stevenson*

Special lecturers: *James Boniface, Terry Dibble, Marjorie Lang, Bonita Leavell*

A Bachelor of Science in Health Sciences degree combines a broad spectrum of liberal arts, basic sciences, social sciences and health sciences course requirements and electives for students who desire a generalized health sciences academic credential. In addition, students choose one of six academic concentrations to obtain greater exposure to a specific health discipline. These six academic specialties include exercise science, integrative holistic medicine, nutrition and health, pre-health professional, pre-pharmacy, and pre-physical therapy. Students completing the exercise science concentration obtain all the academic course prerequisites necessary for consideration for admission to the Master of Science in exercise science program. The integrative holistic medicine concentration prepares students for many traditional and non-traditional health and service-oriented professions and graduate programs. The nutrition and health concentration prepares students to deliver community nutrition interventions as well as apply for graduate programs in public health as well as registered dietetics. The pre-health professional concentration area incorporates basic science courses to prepare students for the traditional application requirements for public health, medical, dental, optometric, physician assistant and other professional schools. The pre-pharmacy concentration area prepares students for application to the Doctor of Pharmacy program at Wayne State University and other institutions. Students completing the pre-physical therapy concentration area obtain all

the academic course prerequisites necessary for consideration for admission to the Oakland University Doctor of Physical Therapy (DPT) Program as well as those at other institutions.

The Applied Health Sciences program is uniquely positioned to allow students to combine courses from the university curriculum with specific Associate of Applied Sciences (AAS) degrees from accredited community colleges. The two-plus-two degree completion program provides for the transfer of up to 65 semester credits from accredited two-year community colleges. Students who have completed AAS degrees in health-related fields including dental assisting, health information technology, medical assistant, occupational therapy assistant, pharmacy technician, physical therapist assistant, respiratory therapy, or surgical technology may qualify for the two-plus-two Applied Health Sciences program. Students with AAS degrees in a health-related field not listed may seek permission to enroll from the Applied Health Sciences Program Director. Concurrent enrollment in a community college AAS program and Oakland University's AHS program is not permitted.

The Applied Health Sciences program requires that courses accepted for transfer must have a grade of C or above, and that all course-work has been taken at accredited institutions. For additional information, see the Transfer student information section of the catalog.

The Applied Health Sciences program is uniquely positioned to allow students to combine courses from the university curriculum with specific Associate of Applied Sciences (AAS) degrees from accredited community colleges. The two-plus-two degree completion program provides for the transfer of up to 65 semester credits from accredited two-year community colleges. Students who have completed AAS degrees in health-related fields including dental assisting, health information technology, medical assistant, occupational therapy assistant, pharmacy technician, physical therapist assistant, respiratory therapy, or surgical technology may qualify for the two-plus-two Applied Health Sciences program. Students with AAS degrees in a health-related field not listed may seek permission to enroll from the Applied Health Sciences Program Director. Concurrent enrollment in a community college AAS program and Oakland University's AHS program is not permitted.

The Applied Health Sciences program requires that courses accepted for transfer must have a grade of C or above, and that all course-work has been taken at accredited institutions. For additional information, see the Transfer student information section of the catalog.

Schedule of classes

Specific offerings for each semester may be found in the Schedule of Classes.

Programs

- Applied Health Sciences, B.S.

- Community Health Engagement Minor
- Health Sciences, B.S.
- Integrative Holistic Health Minor
- Nutrition and Health Minor

Applied Health Sciences, B.S.

Requirements for the B.S. degree with a major in applied health sciences

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 (C) 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

(see *Undergraduate degree requirements). Note that some of the courses under #5 and 6 below satisfy general education requirements and Applied Health Sciences degree requirements. See courses marked with "*"*.

4. Complete the university U.S. diversity requirement.

For applied health sciences majors, this requirement is satisfied by completing HS 3000.

5. Complete the following courses:

- AHS 3320 - Delivering Safe Patient Care **(4)**
- AHS 3340 - Hospital Safety and Health **(4)**
- HS 2000 - Health in Personal and Occupational Environments **(4)**

- HS 3000 - Community and Public Health **(4)**
- HS 4500 - Law, Values and Health Care **(4)**
- * STA 2220 - Introduction to Statistical Concepts and Reasoning **(4)**

  *Courses that also satisfy the university general education requirement.

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

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

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

Health Promotion Track: A minimum of 20 credits of electives

- AHS 3310 - Health Care Safety **(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)**
- EXS 2400 - Weight Control, Nutrition and Exercise **(4)**
- EXS 2700 - Safety and First Aid in Exercise Settings **(2)**
- EXS 3010 - Exercise Physiology **(3)**
- EXS 3015 - Exercise Physiology Laboratory **(1)**
- EXS 3020 - Human Motion Analysis **(4)**

- HS 2150 - Stress Management **(3)**
- HS 2500 - Human Nutrition and Health **(4)**
- HS 3110 - Contemporary Topics in Nutrition **(2)**
- HS 3120 - Community Nutrition **(4)**
- HS 3130 - Nutrition and Culture **(4)**
- HS 3200 - Nutrition and Physical Activity **(2)**
- HS 3210 - Herbs Supplements Nutrition **(2)**
- HS 3220 - Eating Disorders **(2)**
- HS 3230 - Foodborne Illnesses **(2)**
- HS 3240 - Introduction to Food Science **(3)**
- HS 3245 - Introduction to Food Science Lab **(1)**
- HS 3260 - Food Politics **(2)**
- HS 3350 - Introduction to Environmental Health Sciences **(4)**
- HS 3400 - Contemporary Topics in Health **(2)**
- HS 4010 - Pharmacology **(2)**
- HS 4100 - Nutrition and Lifecycles **(4)**
- HS 4150 - Nutrient Metabolism **(4)**
- HS 4410 - Integrative Holistic Medicine Principles and Practice **(4)**
- HS 4430 - Modalities for Healing **(4)**
- HS 4440 - Healing Traditions **(4)**
- HS 4450 - Laughter as Therapeutic Modality **(4)**
- HS 4550 - Qualitative Research Methods **(4)**
- HS 4650 - Social Determinants of Health **(4)**
- HS 4900 - Special Topics **(2 TO 4)**

- HS 4930 - Field Experience in Integrative Studies **(4)**
- HS 4995 - Directed Study **(1 TO 4)**
- CDS 2010 - Careers in Biomedical Diagnostic and Therapeutic Sciences **(1)**
- CDS 2050 - Contemporary Issues in Health Care Organizations and Practice **(2)**
- CDS 2100 - Medical Terminology **(1)**
- CDS 2260 - Introduction to Laboratory Theory and Techniques **(2)**
- CDS 3120 - Hematology/Cellular Pathophysiology **(3)**
- CDS 3140 - Hemostasis **(3)**
- CDS 3350 - Clinical Parasitology/Mycology/Virology **(3)**
- CDS 3360 - Clinical Parasitology/Mycology/Virology Laboratory **(1)**
- CDS 4000 - Medical Genetics **(4)**
- CDS 4010 - Human Pathology **(4)**
- CDS 4020 - Molecular Diagnostics **(3)**
- CDS 4160 - Medical Hematology **(4)**
- CDS 4170 - Hematology Laboratory **(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 4400 - Clinical Correlations **(3)**

- CDS 4900 - Special Topics **(1 TO 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 3350 - Fundamentals of Occupational Hygiene **(3)**
- EHS 3360 - Applied Environmental and Occupational Hygiene with Laboratory **(4)**
- EHS 3380 - Environmental Health and Safety Engineering and Technology **(3)**
- EHS 3420 - Advanced Quantitative Methods for Environmental Health and Safety **(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 - Introduction to Ergonomics **(3)**
- EHS 4460 - Industrial and Environmental Toxicology **(3)**
- EHS 4500 - Medical Geology (Geo-Medicine) **(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 3250 - Issues in Women's Health **(4)**
- WHP 3500 - Health Program Planning, Implementation, and Evaluation **(4)**

- WHP 3600 - Wellness Facilitation **(4)**
- WHP 3700 - Culture, Ethnicity and Well-being **(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 4900 - Special Topics **(1 TO 4)**

7. Complete a total of 130 semester credits with a minimum of 32 credits at the 3000-4000 level required for graduation.

Applied Statistics, B.S.

Requirements for the major in applied statistics, B.S. program

To earn the Bachelor of Science degree with a major in applied statistics, students must:

1. Complete 28 credits in statistics.

- STA 2226 - Applied Probability and Statistics **(4)**
- STA 4002 - Applied Linear Models I **(4)**
- STA 4227 - Introduction to Mathematical Statistics I **(4)**
- STA 4228 - Introduction to Mathematical Statistics II **(4)**
- 12 credits chosen from STA courses numbered above 3000 (but not STA 5001-5002)

2. Complete

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

And one more course chosen from

- APM 2555 - Introduction to Differential Equations with Matrix Algebra **(4)**
- APM 2663 - Discrete Mathematics **(4)**
- APM 3332 - Applied Matrix Theory **(4)**
- APM 4333 - Numerical Methods **(4)**
- APM 4334 - Applied Numerical Methods: Matrix Methods **(4)**
- MTH 4552 - Advanced Calculus I **(4)**
- MOR 2442 - Elementary Models in Operations Research **(4)**
- MOR 4554 - Linear and Integer Optimization **(4)**
- MOR 4555 - Nonlinear Optimizations **(4)**
- MOR 4556 - Stochastic Models in Operations Research **(4)**

3. Complete one of the following.

- CSI 1300 - Introduction to Computer Programming **(4)**
- EGR 1400 - Computer Problem Solving in Engineering and Computer Science **(4)**

4. Complete one of the following.

- ENG 3110 - Advanced Critical Writing **(4)**
- WRT 4908 - Special Topics in Professional Writing **(4)**
- WRT 3081 - Science Writing **(4)**
- WRT 3082 - Business Writing **(4)**

5. Complete a course in ethics given by the Department of Philosophy.

6. Complete 16 credits in a single area outside the Department of Mathematics and Statistics to which statistics could be applied.

The 16 credits must include at least one course that is quantitatively oriented. The rest of the 16 credits could come from prerequisite courses or any related courses. These 16 credits must

be approved in advance by an adviser in the Department of Mathematics and Statistics. The courses need not be in a single department, but the total package should constitute a substantive examination of a single area. Courses used to satisfy this requirement may also be used to satisfy university general education or college exploratory requirements.

7. Earn a minimum grade of C in each mathematical sciences and computer science course used to satisfy the major requirements.

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.

Community Health Engagement Minor

A minor in Community Health Engagement is available to students in any degree program. The minor provides students with a focus on working in real-world community settings in the area of health engagement. A total of 20 credits are required for the minor including 16 core credits and 4 elective credits.

Courses required for the minor (16 credits):

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

Choose 4 credits of electives from the following courses:

- HS 3120 - Community Nutrition **(4)**
- HS 3430 - Sociology of Health and Medicine **(4)**

- HS 4650 - Social Determinants of Health **(4)**
- HS 4750 - Global Health and Social Issues **(4)**
- WHP 4350 - Environmental Justice **(4)**
- HS 4900 - Special Topics **(2 TO 4)**
- HS 4995 - Directed Study **(1 TO 4)**
- WHP 3700 - Culture, Ethnicity and Well-being **(4)**

Health Sciences, B.S.

Requirements for the B.S. degree with a major in health sciences (concentration in exercise science, integrative holistic medicine, nutrition and health, pre-health professional studies, pre-pharmacy, or pre-physical therapy)

1. Meet the university general education requirements

(see Undergraduate degree requirements). Note that several courses under #3 below satisfy general education requirements and Health Sciences degree requirements. See courses marked with "".*

2. Complete the university U.S. diversity requirement.

For health sciences majors, this requirement is satisfied by completing HS 3000.

3. 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)**
- HS 2000 - Health in Personal and Occupational Environments **(4)** *
- HS 3000 - Community and Public Health **(4)** *
- HS 4500 - Law, Values and Health Care **(4)**

- PSY 1000 - Introduction to Psychology **(4)** *
- *Courses that also satisfy the university general education requirement.

4. Complete the course requirements specified under one of the following academic concentration areas (exercise science, integrative holistic medicine, nutrition and health, pre-health professional studies, pre-pharmacy or pre-physical therapy).

Exercise science academic concentration course requirements

Students completing the Bachelor of Science in health sciences with an academic concentration in exercise science must complete a minimum of 124 credits, including the following courses:

1. Required courses

- 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)**
- EXS 1000 - Exercise (Strength Training) and Health Enhancement **(2)**
- EXS 1100 - Cardiovascular Fitness Training **(2)**
- EXS 2400 - Weight Control, Nutrition and Exercise **(4)**
- EXS 2700 - Safety and First Aid in Exercise Settings **(2)**
- EXS 3010 - Exercise Physiology **(3)**
- EXS 3015 - Exercise Physiology Laboratory **(1)**
- EXS 3020 - Human Motion Analysis **(4)**
- EXS 3030 – Motor Control (3)
- EXS 4960 - Practicum in Exercise Science **(5)**
- HS 2250 - Research Methods in Health Science **(4)** or PSY 2500 Research Design in Psychology **(4)**
- HS 4410 - Integrative Holistic Medicine Principles and Practice **(4)**

- STA 2220 - Introduction to Statistical Concepts and Reasoning **(4)** or EHS 2550 Basic Statistics for Health Sciences **(4)**
- PHY 1010 - General Physics I **(4)** * or PHY 1510 Introductory Physics I **(4)**
- PHY 1020 - General Physics II **(4)** * or PHY 1520 Introductory Physics II **(4)**
- PHY 1100 - General Physics Lab I **(1)**
- PHY 1110 - General Physics Lab II **(1)**
- PSY 3440 - Behavior Analysis **(4)** *PREFERRED*

  or
- 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)**

2. Complete a minimum of 9 credits (minimum of 6 credits at 3000 level or above - minimum of 4 credits must be chosen from exercise science courses) from these EXS concentration elective courses.

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

- 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)
- CDS 2100 - Medical Terminology (1)
- CDS 4010 - Human Pathology (4)

- CHM 2340 - Organic Chemistry I (4)
- CHM 2350 - Organic Chemistry II (4)
- CHM 4254 - Biochemistry I (3)
- CHM 4257 - Biochemistry Laboratory (3)
- EXS 2000 - Group Exercise Instruction I (2)
- EXS 2100 - Group Exercise Instruction II (2)
- EXS 2200 - Introduction to Exercise Science (2)
- 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 4600 - Health and Disease (2)
- EXS 4620 - Clinical Biomechanics (2)
- EXS 4630 - Basic Athletic Training (2)
- EXS 4640 - Exercise Electrocardiography (2)
- EXS 4700 - Corporate and Worksite Wellness Programs (2)
- EXS 4800 - Exercise Endocrinology (2)

- EXS 4810 - Physical Activity Epidemiology (2)
- EXS 4900 - Special Topics (1 TO 4)
- EXS 4995 - Directed Study and Research (1 TO 4)
- HS 1000 - Careers in Health (1)
- HS 2150 - Stress Management (3)
- HS 2500 - Human Nutrition and Health (4)
- HS 3110 - Contemporary Topics in Nutrition (2)
- HS 3120 - Community Nutrition (4)
- HS 3130 - Nutrition and Culture (4)
- HS 3200 - Nutrition and Physical Activity (2)
- HS 3210 - Herbs Supplements Nutrition (2)
- HS 3220 - Eating Disorders (2)
- HS 3230 - Foodborne Illnesses (2)
- HS 3240 - Introduction to Food Science (3)
- HS 3245 - Introduction to Food Science Lab (1)
- HS 3260 - Food Politics (2)
- HS 3350 - Introduction to Environmental Health Sciences (4)
- HS 3400 - Contemporary Topics in Health (2)
- 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 4010 - Pharmacology (2)
- HS 4100 - Nutrition and Lifecycles (4)
- HS 4150 - Nutrient Metabolism (4)
- HS 4420 - Mind-Body Medicine (2)
- HS 4450 - Laughter as Therapeutic Modality (4)
- HS 4460 - Mindfulness (4)
- HS 4550 - Qualitative Research Methods (4)
- HS 4650 - Social Determinants of Health (4)
- HS 4750 - Global Health and Social Issues (4)
- HS 4900 - Special Topics (2 TO 4)
- HS 4930 - Field Experience in Integrative Studies (4)
- MTH 1441 - Precalculus (4)
- MTH 1554 - Calculus I (4)
- PT 3020 - Physical Therapy as a Profession (2)
- WHP 2110 - Community Emergency Response Team (CERT) Preparedness (2)
- WHP 2800 - Introduction to Health Literacy (4)
- WHP 3000 - Wellness Across the Life Span (4)
- WHP 3170 - Advanced First Aid/CPR Instruction (2)
- WHP 3250 - Issues in Women's Health (4)
- WHP 3600 - Wellness Facilitation (4)

- WHP 3700 - Culture, Ethnicity and Well-being (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 4100 - Advanced Injury Prevention, Control and Safety Promotion (1 TO 4)
- WHP 4200 - Injury Prevention and the Environment (4)
- WHP 4310 - Crisis Intervention and Prevention of Self Harm (4)
- WHP 4320 - Prevention of Injury and Sudden Death in Sport and Physical Activity (SPA) (2)
- WHP 4350 - Environmental Justice (4)
- WHP 4850 - Population Health, Health Policy, and Healthcare Delivery (4)
- or any other course approved by the program director in writing through approved petition of exception form

Integrative holistic medicine concentration course requirements

Students completing the Bachelor of Science in health sciences with an academic concentration in integrative holistic medicine must complete a minimum of 124 credits, including the following courses:

1. Required courses

- HS 2250 - Research Methods in Health Science **(4)** or PSY 2500 Research Design in Psychology **(4)** or PSY 3180 Biological Psychology **(4)**
- HS 3400 - Contemporary Topics in Health **(2)**
- HS 4410 - Integrative Holistic Medicine Principles and Practice **(4)**
- HS 4430 - Modalities for Healing **(4)**
- HS 4440 - Healing Traditions **(4)**

- HS 4450 - Laughter as Therapeutic Modality **(4)**
- PSY 3180 - Biological Psychology **(4)**
- WHP 3500 - Health Program Planning, Implementation, and Evaluation **(4)**
- WHP 3700 - Culture, Ethnicity and Well-being **(4)**

2. Complete a minimum of 37 credits from these IHM concentration elective courses

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

- 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)**
- BIO 1201 - Biology Laboratory **(1)**
- 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)**
- CDS 2100 - Medical Terminology **(1)**
- CDS 4010 - Human Pathology **(4)**

- CDS 4250 - Medical Biochemistry **(4)**
- CDS 4300 - Clinical Microbiology **(4)**
- CDS 4320 - Medical 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 4254 - Biochemistry I **(3)**
- CHM 4257 - Biochemistry Laboratory **(3)**
- COM 2000 - Public Speaking **(4)**
- EXS 2400 - Weight Control, Nutrition and Exercise **(4)**
- EXS 2700 - Safety and First Aid in Exercise Settings **(2)**
- EXS 3010 - Exercise Physiology **(3)**
- EXS 3015 - Exercise Physiology Laboratory **(1)**
- EXS 3020 - Human Motion Analysis **(4)**
- 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 4810 - Physical Activity Epidemiology **(2)**

- HS 1000 - Careers in Health **(1)**
- HS 2150 - Stress Management **(3)**
- HS 2500 - Human Nutrition and Health **(4)**
- HS 3110 - Contemporary Topics in Nutrition **(2)**
- HS 3120 - Community Nutrition **(4)**
- HS 3130 - Nutrition and Culture **(4)**
- HS 3200 - Nutrition and Physical Activity **(2)**
- HS 3210 - Herbs Supplements Nutrition **(2)**
- HS 3220 - Eating Disorders **(2)**
- HS 3230 - Foodborne Illnesses **(2)**
- HS 3240 - Introduction to Food Science **(3)**
- HS 3245 - Introduction to Food Science Lab **(1)**
- HS 3260 - Food Politics **(2)**
- HS 3350 - Introduction to Environmental Health Sciences **(4)**
- 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 4010 - Pharmacology **(2)**
- HS 4100 - Nutrition and Lifecycles **(4)**
- HS 4150 - Nutrient Metabolism **(4)**
- HS 4420 - Mind-Body Medicine **(2)**
- HS 4460 - Mindfulness **(4)**
- HS 4550 - Qualitative Research Methods **(4)**

- HS 4650 - Social Determinants of Health **(4)**
- HS 4750 - Global Health and Social Issues **(4)**
- HS 4900 - Special Topics **(2 TO 4)**
- HS 4930 - Field Experience in Integrative Studies **(4)**
- MTH 1441 - Precalculus **(4)**
- MTH 1554 - Calculus I **(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 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 4100 - Advanced Injury Prevention, Control and Safety Promotion **(1 TO 4)**
- WHP 4200 - Injury Prevention and the Environment **(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)**
- or any other course approved by the program director in writing through approved petition of exception form.

Nutrition and Health academic concentration course requirements

1. Required courses

Students completing the Bachelor of Science in health sciences with an academic concentration in nutrition and health must complete 124 credits, including the following courses:

- 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)**
- CDS 4250 - Medical Biochemistry **(4)** or BIO 3232 Biochemistry I **(4)**
- HS 2250 - Research Methods in Health Science **(4)** or PSY 2500 Research Design in Psychology **(4)**
- HS 2500 - Human Nutrition and Health **(4)**
- HS 4100 - Nutrition and Lifecycles **(4)**
- HS 3110 - Contemporary Topics in Nutrition **(2)**
- HS 3120 - Community Nutrition **(4)**
- HS 3130 - Nutrition and Culture **(4)**

- HS 4150 - Nutrient Metabolism **(4)**
- 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 **(4)**

2. Complete a minimum of 23 credits from the following:

(At least 8 credits at 3000-4000 level and at least 4 credits must be Nutrition courses: HS 3200, HS 3210, HS 3220, HS 3230, HS 3240, HS 3245)

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

- BIO 3360 - Organic Farming **(4)**
- BIO 3361 - Organic Farming Laboratory **(1)**
- BIO 4900 - Selected Topics in Biology **(1 TO 5)**
- CDS 2010 - Careers in Biomedical Diagnostic and Therapeutic Sciences **(1)**
- CDS 2100 - Medical Terminology **(1)**
- 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)**
- EXS 2400 - Weight Control, Nutrition and Exercise **(4)**
- EXS 2700 - Safety and First Aid in Exercise Settings **(2)**
- EXS 3010 - Exercise Physiology **(3)**
- EXS 3015 - Exercise Physiology Laboratory **(1)**
- EXS 3020 - Human Motion Analysis **(4)**
- 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)**
- HS 1000 - Careers in Health **(1)**
- HS 2150 - Stress Management **(3)**
- HS 3200 - Nutrition and Physical Activity **(2)**
- HS 3210 - Herbs Supplements Nutrition **(2)**
- HS 3220 - Eating Disorders **(2)**
- HS 3230 - Foodborne Illnesses **(2)**
- HS 3240 - Introduction to Food Science **(3)**
- HS 3245 - Introduction to Food Science Lab **(1)**
- HS 3350 - Introduction to Environmental Health Sciences **(4)**
- 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 4410 - Integrative Holistic Medicine Principles and Practice **(4)**

- HS 4420 - Mind-Body Medicine **(2)**
- HS 4430 - Modalities for Healing **(4)**
- HS 4440 - Healing Traditions **(4)**
- HS 4450 - Laughter as Therapeutic Modality **(4)**
- HS 4550 - Qualitative Research Methods **(4)**
- HS 4650 - Social Determinants of Health **(4)**
- HS 4460 - Mindfulness **(4)**
- HS 4900 - Special Topics **(2 TO 4)**
- HS 4930 - Field Experience in Integrative Studies **(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 3440 - Behavior Analysis **(4)**
- PSY 3450 - Health Psychology **(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 4100 - Advanced Injury Prevention, Control and Safety Promotion **(1 TO 4)**
- WHP 4200 - Injury Prevention and the Environment **(4)**
- WHP 4350 - Environmental Justice **(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 of exception form

Pre-health professional academic concentration course requirements

Students completing the Bachelor of Science in health sciences with an academic concentration in Pre-Health Professional studies must complete a minimum of 124 credits, including the following courses:

- BIO 1300 - Biology II **(4)** *
- CDS 4010 - Human Pathology **(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 2250 - Research Methods in Health Science **(4)** or PSY 2500 Research Design in Psychology **(4)** or PSY 2250 Introduction to Life-Span Developmental Psychology **(4)**
- HS 2500 - Human Nutrition and Health **(4)**
- 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 **(4)**
- PHY 1010 - General Physics I **(4)** * or PHY 1510 Introductory Physics I **(4)**
- PHY 1020 - General Physics II **(4)** * or PHY 1520 Introductory Physics II **(4)**

- PHY 1100 - General Physics Lab I **(1)**
- PHY 1110 - General Physics Lab II **(1)**

1. Complete a minimum of 13 credits from the following: (At least 13 credits at 3000-4000 level)

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

- 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 1201 - Biology Laboratory **(1)**
- 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)**
- CDS 2100 - Medical Terminology **(1)**
- 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 - Human Motion Analysis **(4)**
- EXS 4300 - Human Performance Enhancement **(2)**
- EXS 4600 - Health and Disease **(2)**
- EXS 4620 - Clinical Biomechanics **(2)**
- EXS 4630 - Basic Athletic Training **(2)**
- EXS 4400 - Obesity and Physical Activity **(2)**
- EXS 4500 - Healthy Lifestyle Choices **(2)**
- EXS 4810 - Physical Activity Epidemiology **(2)**
- HS 2150 - Stress Management **(3)**
- HS 3400 - Contemporary Topics in Health **(2)**
- 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 **(4)**
- HS 4750 - Global Health and Social Issues **(4)**
- NRS 2011 - Pathophysiology **(3)**
- NRS 2021 - Nursing Informatics **(2)**
- NRS 3041 - Pharmacology in Nursing **(3)**
- PHY 3260 - Medical Physics **(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 Planning, Implementation, and Evaluation **(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 4200 - Injury Prevention and the Environment **(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

Professional School Admission Requirements

Students are **required** to review the professional school admission requirements before selecting elective credits.

Pre-pharmacy academic concentration course requirements

Students completing the Bachelor of Science in Health Sciences with an academic concentration in pre-pharmacy must complete a minimum of 124 credits. Completion of this concentration requires at least one year of a professional accredited pharmacy school with a minimum of 20 credits of professional PharmD coursework.

Including:

- CDS 2100 - Medical Terminology **(1)**
- CDS 4010 - Human Pathology **(4)**
- CDS 4250 - Medical Biochemistry **(4)** or BIO 3400 - Genetics**(4)**
- CDS 4300 - Clinical Microbiology **(4)**
- CDS 4320 - Medical 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 1020 - General Physics II **(4)** *or PHY 1520 Introductory Physics II **(4)**
- PHY 1100 - General Physics Lab I **(1)**
- PHY 1110 - General Physics Lab II **(1)**
- STA 2220 - Introduction to Statistical Concepts and Reasoning **(4)** or EHS 2550 Basic Statistics for Health Sciences **(4)**

Pre-Pharmacy Tracks

Students pursuing a Bachelor of Science with a major in health sciences 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 maturation.

Pre-Physical therapy academic concentration course requirements

Students completing the Bachelor of Science in health sciences with an academic concentration in pre-physical therapy must complete a minimum of 124 credits.

1. Required courses

- CDS 2100 - Medical Terminology **(1)**
- CDS 4010 - Human Pathology **(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)**

- EXS 2400 - Weight Control, Nutrition and Exercise **(4)**
- EXS 2700 - Safety and First Aid in Exercise Settings **(2)**
- EXS 3010 - Exercise Physiology **(3)**
- EXS 3015 - Exercise Physiology Laboratory **(1)**
- EXS 3020 - Human Motion Analysis **(4)**
- MTH 1441 - Precalculus **(4)** or MTH 1554 - Calculus I (4)
- PHY 1010 - General Physics I **(4)** * or PHY 1510 Introductory Physics I **(4)**
- PHY 1020 - General Physics II **(4)** * or PHY 1520 Introductory Physics II **(4)**
- PHY 1100 - General Physics Lab I **(1)**
- PHY 1110 - General Physics Lab II **(1)**
- PSY 2500 - Research Design in Psychology **(4)**
- PT 3020 - Physical Therapy as a Profession **(2)**
- PT 4630 - Basic Athletic Training **(2)**
- STA 2220 - Introduction to Statistical Concepts and Reasoning **(4)**

+ choose one of the following

- 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)**

2. Complete a minimum of 12 elective credits from the following: (At least 8 credits at 3000-4000 level)

Note: Courses cannot be used to satisfy both concentration requirements and the major core requirements.

Courses required for the major and the concentration cannot be counted as an elective.

- 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 4600 - Health and Disease **(2)**
- EXS 4620 - Clinical Biomechanics **(2)**
- EXS 4640 - Exercise Electrocardiography **(2)**
- EXS 4400 - Obesity and Physical Activity **(2)**
- EXS 4500 - Healthy Lifestyle Choices **(2)**
- EXS 4700 - Corporate and Worksite Wellness Programs **(2)**
- EXS 4800 - Exercise Endocrinology **(2)**
- EXS 4995 - Directed Study and Research **(1 TO 4)**
- BIO 3130 - Developmental Biology **(4)**
- BIO 3232 - Biochemistry I **(4)**
- BIO 3233 - Biochemistry I Laboratory **(1)**
- BIO 3400 - Genetics **(4)**
- CHM 4254 - Biochemistry I **(3)**
- CHM 4257 - Biochemistry Laboratory **(3)**
- HS 1000 - Careers in Health **(1)**
- HS 2150 - Stress Management **(3)**
- HS 2500 - Human Nutrition and Health **(4)**
- HS 3110 - Contemporary Topics in Nutrition **(2)**
- HS 3120 - Community Nutrition **(4)**
- HS 3130 - Nutrition and Culture **(4)**

- HS 3220 - Eating Disorders **(2)**
- HS 3230 - Foodborne Illnesses **(2)**
- HS 3240 - Introduction to Food Science **(3)**
- HS 3245 - Introduction to Food Science Lab **(1)**
- HS 3260 - Food Politics **(2)**
- HS 3400 - Contemporary Topics in Health **(2)**
- 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 4100 - Nutrition and Lifecycles **(4)**
- HS 4150 - Nutrient Metabolism **(4)**
- HS 4410 - Integrative Holistic Medicine Principles and Practice **(4)**
- HS 4420 - Mind-Body Medicine **(2)**
- HS 4430 - Modalities for Healing **(4)**
- HS 4440 - Healing Traditions **(4)**
- HS 4450 - Laughter as Therapeutic Modality **(4)**
- HS 4460 - Mindfulness **(4)**
- HS 4750 - Global Health and Social Issues **(4)**
- PHY 3260 - Medical Physics **(4)**
- PSY 3330 - Motivation **(4)**
- PSY 3450 - Health Psychology **(4)**
- PT 4920 - Directed Study **(1 TO 4)**
- WHP 3250 - Issues in Women's Health **(4)**

- WHP 3500 - Health Program Planning, Implementation, and Evaluation **(4)**
- WHP 3600 - Wellness Facilitation **(4)**
- WHP 3700 - Culture, Ethnicity and Well-being **(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 4200 - Injury Prevention and the Environment **(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)**
- or any other course approved by the program director in writing through approved petition of exception form

Integrative Holistic Health Minor

A minor in Integrative Holistic Health is available to students in any degree program. A minimum of 20 credits are required for the minor including 14 core credits and a minimum of 6 elective credits.

Courses required for the minor (14 credits):

- HS 4410 - Integrative Holistic Medicine Principles and Practice **(4)**
- HS 4420 - Mind-Body Medicine **(2)**
- HS 4430 - Modalities for Healing **(4)**
- HS 4440 - Healing Traditions **(4)**

Choose at least 6 credits of electives from the following courses:

- HS 2150 - Stress Management **(3)**

- HS 3110 - Contemporary Topics in Nutrition **(2)** or HS 3400 Contemporary Topics in Health **(2)**
- HS 3210 - Herbs Supplements Nutrition **(2)**
- HS 3430 - Sociology of Health and Medicine **(4)** or WHP 3700 Culture, Ethnicity and Well-being **(4)**
- HS 4450 - Laughter as Therapeutic Modality **(4)**
- HS 4460 - Mindfulness **(4)**
- HS 4900 - Special Topics **(2 TO 4)**
- HS 4995 - Directed Study **(1 TO 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 total of 22 credits are required for the minor including 18 core credits and 4 elective credits. A minimum GPA of C is required in each course for the minor.

Courses required for the minor (18 credits):

- HS 2500 - Human Nutrition and Health **(4)**
- HS 4100 - Nutrition and Lifecycles **(4)**
- HS 3110 - Contemporary Topics in Nutrition **(2)**
- HS 3120 - Community Nutrition **(4)**
- HS 3130 - Nutrition and Culture **(4)**

Choose 4 credits of electives from the following courses:

- HS 3200 - Nutrition and Physical Activity **(2)**
- HS 3210 - Herbs Supplements Nutrition **(2)**
- HS 3220 - Eating Disorders **(2)**

- HS 3230 - Foodborne Illnesses **(2)**
- HS 3240 - Introduction to Food Science **(3)**
- HS 3245 - Introduction to Food Science Lab **(1)**
- HS 4150 - Nutrient Metabolism **(4)**

Courses

AHS 3310 - Health Care Safety (4)
Reviews common safety practices to be used throughout the health care arena (covering both employee and patient safety) including incident reporting, infection control, lifting techniques, error prevention, reporting systems, workforce issues, accountability, laws and regulations and the promotion and implementation of safety programs and practices.
Prerequisite(s): HS 2000 and HS 3000

AHS 3320 - Delivering Safe Patient Care (4)
Discusses the core principles and best practices of patient safety in both hospital and ambulatory care settings by focusing on error prevention, reporting systems and information technology, workforce issues, training issues, accountability and various laws and regulations.
Prerequisite(s): HS 2000 and HS 3000

AHS 3340 - Hospital Safety and Health (4)
Concentrates on the principles and practices of safety in the hospital setting by focusing on exposures including tuberculosis, needle-sticks, anesthesia gases, latex allergies, radiation, medical waste, and the controls necessary to prevent injury both to the health care employee and the patient.
Prerequisite(s): HS 2000 and HS 3000

AHS 4310 - Ergonomics in the Health Care Industry (3)
This course equips healthcare workers with knowledge and skills to recognize and reduce ergonomic risks that may lead to a musculoskeletal disorder (MSD) in their workplace and to enhance their understanding of and communication with patients that may be receiving treatment for MSDs at their facility.
Prerequisite(s): HS 2000 and HS 3000 and BIO 2100 and BIO 2600

AHS 4320 - Risk Reduction Safety Culture Improvement in Healthcare (2)
This course explores the factors critical for a positive workplace safety culture including supporting behaviors of site leadership personnel and safety behaviors of employees. Students will apply contemporary problem solving strategies to reduce risks for blood borne pathogens,

slips and falls, patient handling, and other injuries and illnesses of healthcare workers.
Prerequisite(s): HS 2000 and HS 3000

HS 1000 - Careers in Health (1)
An introduction to programs and career opportunities offered through the School of Health Sciences. This is an important required course for students interested in all programs within the School. We will address curriculum planning, career options associated with the various programs, internships and capstone experiences.

HS 2000 - Health in Personal and Occupational Environments (4)
Current information about the impact of environmental and lifestyle factors on health. The impact of exercise, weight control, substance abuse, nutrition and stress management on person's ability to cope with environmental stresses will be analyzed. *Satisfies the general education requirement in the natural science and technology knowledge exploration area.*

HS 2150 - Stress Management (3)
In this experiential and interactive course, students will learn and apply evidence-based concepts and skills to prevent and manage stress effectively. This course presents materials on personality, exercise, time management, meditation, mindfulness, relaxation, communication, and other stress management techniques.

HS 2250 - Research Methods in Health Science (4)
This course is an undergraduate introduction to the research process, such as design, function and interpretation of research in the social sciences. Provides necessary preparation to evaluate the empirically based content in the health sciences.
Prerequisite(s): HS 2000 (C)

HS 2500 - Human Nutrition and Health (4)
Chemical, biological, social and psychological elements of human nutrition. Constituents of food and their functions in human health and disease.

HS 3000 - Community and Public Health (4)
Biological, psychosocial, socio-cultural, economic, philosophical, political, ethical, environmental, community and public health organization factors, as determinants of health are discussed relative to the distribution, cause, prevention, and treatment of disease. Topics include epidemiological health indicators, goals, systems of health care delivery, disparities, diversity/stereotyping, gender, age and disability issues. *Satisfies the university general*

education requirement in the social science knowledge exploration area and in U.S. Diversity.
Prerequisite(s): HS 2000 or instructor permission.

HS 3110 - Contemporary Topics in Nutrition (2)
Explores the changing frontier of nutritional sciences and provides the basis for understanding and evaluation of new nutritional information with an emphasis on encouraging individuals to make healthy food/lifestyle choices.
Prerequisite(s): HS 2500

HS 3120 - Community Nutrition (4)
Explores nutrition issues specific to various populations within the community and incorporates an entrepreneurial approach to improving the public's nutritional and health status. Introduces community nutrition planning, policies, and resources along with techniques for interviewing and counseling clients.
Prerequisite(s): HS 2500

HS 3130 - Nutrition and Culture (4)
Critically evaluate the impact and influences of evolution, geography, environment, social structure and religion on food practices and the human diet. Identify factors that influence current food practices and the influence of culture in what, how, when and why we eat.
Prerequisite(s): HS 2500

HS 3200 - Nutrition and Physical Activity (2)
Course explores the specific roles of energy and nutrients in physical performance. Topics include ergogenic aids, nutritional management, weight change, unique dietary concerns for females, endurance, vegetarian athletes, hydration. Carbohydrate, protein, and fat metabolism during exercise will be explored.
Prerequisite(s): HS 2500

HS 3210 - Herbs Supplements Nutrition (2)
Students will evaluate the scientific validity of dietary supplements and herbs. Focus will be placed on safety, dosage, and bioavailability of individual supplements and their uses for various conditions. Additional topics include governmental regulation of dietary supplements, legal and ethical issues.
Prerequisite(s): HS 2500

HS 3220 - Eating Disorders (2)
Introduction to eating disorders, correlated issues, and treatment. Anorexia nervosa, bulimia nervosa and binge eating disorder to be examined. Topics include development risk factors,

health consequences, prevention and intervention strategies.
Prerequisite(s): HS 2500

HS 3230 - Foodborne Illnesses (2)
Introduction to foodborne illnesses and food safety. Overview of concepts of the public health response to foodborne illness, including surveillance, outbreak investigation, discussion of most common agents, and safe practices. USDA Food laws and regulations analyzed.
Prerequisite(s): HS 2500

HS 3240 - Introduction to Food Science (3)
Introductory exploration of foods and food science, including the principles and procedure of food selection and preparation.
Prerequisite(s): HS 2500
Corequisite(s): HS 3245

HS 3245 - Introduction to Food Science Lab (1)
Introductory exploration of foods and food science, including the principles and procedure of food selection and preparation.
Prerequisite(s): HS 2500
Corequisite(s): HS 3240

HS 3260 - Food Politics (2)
This course explores how food politics influence the food supply, food processing, and individual dietary decisions. Topics will be explored from both an historical perspective as well as a contemporary perspective to keep up with ever-changing food and nutrition rules and regulations.
Prerequisite(s): HS 2500

HS 3350 - Introduction to Environmental Health Sciences (4)
This course serves as an introduction to the core concepts, principles, and applications of environmental health sciences. Students will learn the sources of and ways to control the important physical, chemical, biological, and sociological factors that impact human health in various environments.
Prerequisite(s): HS 2000
Pre/Corequisite(s): HS 3000

HS 3400 - Contemporary Topics in Health (2)
An evidence-based approach for understanding contemporary issues in health from an interdisciplinary perspective integrating biological, psychological, sociological, philosophical,

and ethical perspectives.
Prerequisite(s): HS 2000, WRT 1060

HS 3430 - Sociology of Health and Medicine (4)
The sociological study of medicine and the uses of sociology in medicine, definitions of health and illness, disease and death, health care occupations, medical malpractice, the organization of health services and trends in health and medicine. Identical to SOC 3430.

HS 3440 - Introduction to Community Engagement (4)
This course will explore fundamental questions about what is the nature of service, what leads to the formation of true community, what constitutes a healthy social system, and what is the relationship between community wellbeing and a myriad of social structures. This course provides an overview of theory and practice emphasizing critical analysis of policies, services and trends. The purpose of this course is to provide an opportunity to explore service, community, and health by combining a community service experience with your academic study.

HS 3450 - Leadership and Healthcare (4)
The course will exam leadership theory and research, and will emphasize the development of leadership and interpersonal skills necessary in the field of healthcare though case study analysis, self-assessment, and reflective thinking methods.

HS 3460 - Community Engaged Research Experience (4)
This service-learning based class provides students with knowledge and hands-on experience with applied research methodologies in community settings. Students will explore theory and application of both qualitative and quantitative methodologies within diverse populations.

HS 4010 - Pharmacology (2)
An introduction to the principles of pharmacology, including the principles of drug therapy and the actions of the basic classes of drugs. Cross-list with HS 5010.
Prerequisite(s): BIO 2600 or BIO 3620

HS 4100 - Nutrition and Lifecycles (4)
This course is designed to develop an understanding of the contribution of nutrition to health and well-being throughout the life cycle, and to create a foundation for health promotion and disease prevention during each of life stages.
Prerequisite(s): HS 2500

HS 4150 - Nutrient Metabolism (4)

Course addresses the metabolism of carbohydrates, proteins, fats, vitamins, and minerals. Associations with dietary requirements and disease processes, nutrient interactions, nutrient stability and bioavailability, and food sources will be covered.
Prerequisite(s): HS 4100, CHM 1450, and BIO 2600, BIO 3620, CDS 4250 or BIO 3232

HS 4410 - Integrative Holistic Medicine Principles and Practice (4)
Evidence-based complementary and alternative modalities will be explored and used to formulate new, holistic approaches for promoting health and treating diseases. Discussions will be related to students' life experiences and other disciplines. Topics include: stress management, psychoneuroimmunology, biofeedback, nutrition, herbology and oriental medicine.

HS 4420 - Mind-Body Medicine (2)
Examines the role of stress, emotions and other psychological states that bring about physiological changes affecting health and disease. Topics include psychoneuroimmunology, stress management, guided imagery, the relaxation response, exercise, nutrition, laughter and humor, and the role of personality. Applications include patient motivation, empowerment and variability in response to treatment.

HS 4430 - Modalities for Healing (4)
Healing differentiated from curative approaches, and an introduction to frequently used complementary and alternative therapies including massage, hypnosis, herbology, osteopathic manipulation, acupuncture, chiropractic, naturopathy and homeopathy. Critical examination of the techniques used, possible mechanisms, evidence for safety and efficacy, and professional training/credentialing.
Prerequisite(s): HS 4410 or HS 4420 with a minimum grade of D.

HS 4440 - Healing Traditions (4)
This course examines and compares Eastern and Western healing traditions. Origin, evolution, applications, and degree of acceptance of these healing traditions is examined with regard to individual beliefs, and in relation to cultural, historical, political, and economic aspects of competing health systems.
Prerequisite(s): HS 4410 or HS 4420 with a minimum grade of D

HS 4450 - Laughter as Therapeutic Modality (4)
Exploration of the health benefits of laughter therapy including mediatory effects on immune system functioning, pain reduction, and utility in stress management. Students will investigate the extant research relating to humor as a healing modality, while having opportunities to add to that knowledge through a laboratory component. *Satisfies the university general education*

requirement in the knowledge application integration area. Satisfies the university general education requirement for a writing intensive course in general education or the major, not both.
Prerequisite(s): completion of the university writing foundation requirement. Completion of the university general education requirement in either the natural science and technology or the social science knowledge exploration area.

HS 4460 - Mindfulness (4)
An overview of the practice of mindfulness (formal and informal), the mind-body connection, and utilizing mindfulness in stress reduction, transforming fear, and interpersonal relationships.
Prerequisite(s): WRT 1060 (minimum grade of C), HS 2000

HS 4500 - Law, Values and Health Care (4)
Examination of legal concepts, problems, institutions that shape/control professional responsibility, problems associated with maintaining and terminating life, licensure and related questions in organization and delivery of health services. *Satisfies the university general education requirement for the capstone experience. Satisfies university general education requirement for writing intensive course in the major. Prerequisite for writing intensive: completion of the university writing foundation requirement.*
Prerequisite(s): WRT 1060 and senior standing.

HS 4550 - Qualitative Research Methods (4)
The course will cover underlying epistemology, study design principles, data collection methods, and data analysis strategies of qualitative research. Students will read, critique, and discuss examples of published qualitative research and then collect and analyze qualitative data to answer a research question of their choice. Instructor permission required. Cross list with PH 5550.

HS 4650 - Social Determinants of Health (4)
This course will examine the structural and social factors that impact health, the connection between these factors and health inequities, and promising interventions to address these social determinants of health. Instructor permission required. Cross list with PH 5650.

HS 4750 - Global Health and Social Issues (4)
Introduction to global health and social issues particularly in developing countries. Course examines social, cultural, and environmental contexts in which people live and how factors influence health and development. Topics include poverty, development, sexuality, inequity, and health programs in low-resource settings.
Prerequisite(s): HS 2000 or instructor permission.

HS 4900 - Special Topics (2 TO 4)
May be repeated for additional credit.
Prerequisite(s): permission of instructor.

HS 4930 - Field Experience in Integrative Studies (4)
This course integrates previous academic course work into a coherent understanding of how the educational experience serves to enhance individual and community well being. *Satisfies the university general education requirement for a writing intensive course in the major. Prerequisite of the university writing foundation requirement. Satisfies the university general education requirement for the capstone experience.*
Prerequisite(s): WRT 1060 with at least a (C) and Integrative Studies major standing or instructor permission.

HS 4995 - Directed Study (1 TO 4)
Student-initiated and problem-oriented directed study focusing on health sciences issues. May be repeated for additional credit. Graded numerically or S/U.
Prerequisite(s): departmental permission.

Department of Public and Environmental Wellness

Human Health Building

433 Meadow Brook Road

Rochester, MI 48309-4452

(248) 370-3562

Chairperson: *Florence J. Dallo*

Environmental Health and Safety Director: *Patrick R. Frazee*

Wellness and Health Promotion Coordinator: *Florence J. Dallo*

Public Health Coordinator: *Rebecca R. Cheezum*

Associate professor: *Florence J. Dallo*

Assistant professor: *Elise C. Brown, Rebecca R. Cheezum, Caress A. Dean, Richard O. Olawoyin, Mozhgon Rajaee, Katherine M. Rougeau, Kwame S. Sakyi*

Special instructor: *Charles W. McGlothlin, Jr.*

Full-time adjunct instructor: *Patrick R. Frazee*

Special Lecturer: *Charles M. Rinehart*

Lecturers: *David N. Andrews, Malcom E. Dunbar, Robert T. Hart, Darryl C. Hill, Thomas W. Schenk*

Environmental Health and Safety Program

Environmental Health and Safety (EHS) is a specified branch of the health engineering professions, focusing on the environmental protection and occupational safety. Protecting America's workers, the environment and the general public from injury and illness in today's age of technological advancement has become one of the most challenging and rewarding professions available. Environmental Health and Safety professionals strive to identify, evaluate and eliminate or control hazards which expose people, property or the environment to danger or harm. The EHS profession applies fundamental exposure assessment techniques (both qualitative and quantitative) for environmental health protection, particularly; the physiological and/or toxicological interactions of physical, chemical, biological, mechanical, electrical and ergonomic agents, factors, and/or stressors with the human body. Environmental Health and Safety also aims to prevent occupational injuries, diseases or illnesses that may occur in the work environment. In addition, the EHS professional is involved in the prevention of accidents that could cause property or environmental damages.

The Environmental Health and Safety program is multi-disciplinary in nature, providing students with relevant exposure to basic sciences and behavioral science subjects as well as a thorough introduction to environmental health, occupational safety and industrial hygiene concepts. A one-semester internship in the senior year of the program provides students with first-hand field experience in the practice of environmental health and safety. Internship placements are coordinated by the program director and include manufacturing, insurance, health care, energy and engineering, construction, service, consulting, labor, and government organizations.

Graduates of the program will find employment opportunities in a wide variety of occupations, including: health care facilities; industrial firms; petrochemical and energy; construction companies; insurance companies; professional associations; local, state, and federal government; and labor organizations. Oakland University's proximity to many of the national's leading industrial companies provides a wealth of experiential learning opportunities throughout the EHS curriculum, particularly for the internship placements. These world class companies also offer employment opportunities to the EHS graduate.

Wellness and Health Promotion Program

The rigorous Wellness and Health Promotion (WHP) program is accredited by the National Wellness Institute (NWI). Wellness and Health Promotion graduates achieving an overall GPA of 2.75 may register as certified wellness practitioners (CWP) with the NWI. The primary goal of the WHP program is to prepare students for entry to graduate programs of study in fields such as exercise science, health education, human resources, public health, and related professional and medical fields such as a second degree in nursing, physician assistant, or medicine. Therefore, a parallel secondary function of the WHP program is to prepare students for entry-level employment in a variety of allied health, commercial, industrial, government, hospital, community and non-profit organizations. Professional skills of graduates are utilized in health enhancement, disease prevention, health education/promotion, health and fitness, corporate and work-site wellness, as well as human resource practice and management.

Schedule of classes

Specific offerings for each semester may be found in the Schedule of Classes.

Programs

- Environmental Health and Safety, B.S.
- Environmental Health and Safety Minor
- Wellness and Health Promotion Minor
- Wellness and Health Promotion, B.S.

Environmental Health and Safety, B.S.

Program Educational Objectives

The Environmental Health and Safety program contributes to the institution's mission by offering a high-quality baccalaureate degree that meets and exceeds the educational outcomes-based criteria established by the American Society of Safety Engineers for a B.S. degree in a safety-related career field. The graduates the Environmental Health and Safety program are prepared to become effective safety and health professionals. During their first five years after graduation, graduates will be able to:

1. Demonstrate excellent technical capabilities in evaluating & controlling environmental/ workplace hazardous conditions and practices.

2. Effectively analyze & develop cost effective safe operating procedures and EHS programs.

3. Work collaboratively and effectively with colleagues, managers and citizens in building a safe productive organization and community.
4. Be responsible citizens and effectively work with labor & mgt. in addressing workplace EHS issues.
5. Apply sound design methodology in multidisciplinary areas to measure, evaluate and analyze EHS performance.
6. Uphold professional, environmental, cultural, diversity, ethical standards and contemporary knowledge in EHS practice.
7. Continue their professional advancement through life-long learning.
8. Enhance the community through civic responsibility and the promotion of economic development.
9. Competently use mathematical methods, engineering analysis and computations, and measurement and instrumentation techniques for compliance to EHS standards, regulations & codes.
10. Practice effective oral and written communication skills.
11. Demonstrate Leadership in the Profession by active participation in EHS organizations.

Student Outcomes

Baccalaureate degree students graduating from the Environmental Health and Safety program at Oakland University will be able to demonstrate the ability to:

1. Design and evaluate a comprehensive safety and health program.
2. Use the techniques, skills and modern scientific and technical tools necessary for professional practice.
3. Be proficient in written composition and oral communications.
4. Apply science knowledge to solve problems using algebra, statistics, human physiology and anatomy, physics, chemistry, as it pertains to EHS practice.
5. Anticipate, recognize, evaluate, and develop control strategies for hazardous conditions and work practices.
6. Identify and apply applicable standards, regulations, and codes for hazard control and work programs.

7. Work effectively on multidisciplinary teams.
8. Design, conduct experiments, analyze and interpret data to provide control solutions to EHS issues.
9. Recognize and appreciate professional and ethical responsibilities of EHS professionals.
10. Synthesize contemporary EHS issues and the impacts of their solutions within a global and societal context.
11. Engage in continued professional development through graduate study, professional cert. and to become lifelong learners.

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. A final course grade below the required minimum places a student on probation, which requires a meeting with the program director or a designated representative to discuss a method of remediation. In most cases, the method of remediation involves repeating the course in which the unsatisfactory grade was earned. See repeating courses for additional information.

Transfer Courses

Individuals who already have a degree from a regionally accredited associate or bachelor degree program may transfer a maximum of 62 credits that apply to the B.S. in Environmental Health and Safety degree program requirements.

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 125 credits, including the following requirements:

1. Meet the university general education requirements

(see Undergraduate degree requirements). Note that several courses under requirement number three below satisfy general education requirements and Environmental Health and Safety degree requirements. See courses marked with "*".

2. Complete the university U.S. diversity requirement

For Environmental Health and Safety majors, this requirement is satisfied by completing HS 3000 Community and Public Health **(4)** or any other course under the diversity category.

3. 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 2550 - Basic Statistics for Health Sciences **(4)** * or STA 2220 Introduction to Statistical Concepts and Reasoning **(4)** *
- HS 2000 - Health in Personal and Occupational Environments **(4)**
- 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)**

4. Elective credits

Minimum 10 credits

- AHS 3310 - Health Care Safety **(4)**
- AHS 3340 - Hospital Safety and Health **(4)**
- EHS 3420 - Advanced 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)**
- 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)**
- 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*

5. Complete the major courses

- EHS 1000 - Introduction to Environmental Health and Safety **(1)** or EHS 1150 Environmental Health and Safety at Work **(2)**
- 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 3250 - Quantitative Methods for Environmental Health and Safety **(4)** *
- EHS 3300 - Safety and Health Administration and Programs **(3)**
- EHS 3330 - Fire Prevention and Protection **(3)**
- EHS 3350 - Fundamentals of Occupational Hygiene **(3)**
- EHS 3360 - Applied Environmental and Occupational Hygiene with Laboratory **(4)**

- EHS 3380 - Environmental Health and Safety Engineering and Technology **(3)**
- 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 - Introduction to Ergonomics **(3)**
- EHS 4460 - Industrial and Environmental Toxicology **(3)**
- EHS 4500 - Medical Geology (Geo-Medicine) **(4)**
- EHS 4950 - Environmental Health and Safety Capstone Course Internship **(4)** (may only be taken with permission of the EHS program director)

Bachelor of science in Environmental Health and Safety 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 GPA 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 GPA of C+ or higher.

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

May transfer a maximum of 62 credits from community colleges that apply to the BS EHS degree program requirements. In addition, 22 Environmental Health and Safety credits will be granted through a course competency process. This process includes:

1. Successful completion of the CSP examination
2. Evidence of a valid, current CSP certification
3. Registration for competency credits as per the OU Undergraduate Catalog
4. Registration for approved competency credit courses to include EHS 1000, 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 125 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.

Bachelor of Science in Environmental Health and Safety 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 11 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 125 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 1000 - Introduction to Environmental Health and Safety **(1)** or EHS 1150 Environmental Health and Safety at Work **(2)**
- 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)**

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 26 credit hours is required for a minor in Environmental Health and Safety.

Courses required for the minor include

- EHS 1000 - Introduction to Environmental Health and Safety (1) or EHS 1150 Environmental Health and Safety at Work (2)
- EHS 2250 - Environmental Health and Safety Training Methods (3)
- EHS 2350 - Occupational Safety and Health Standards (3)
- EHS 3250 - Quantitative Methods for Environmental Health and Safety (4)
- EHS 3300 - Safety and Health Administration and Programs (3)
- EHS 3350 - Fundamentals of Occupational Hygiene (3)
- EHS 3380 - Environmental Health and Safety Engineering and Technology (3)
- EHS 4410 - Accident/Incident Investigation and Analysis (3)
- EHS 4440 - Environmental Standards (3)

Internship

An internship is recommended to enhance job placement. The internship may be taken on a for-credit or not for-credit basis. If taken for credit, the student must register for EHS 4950 Environmental Health and Safety Capstone Course Internship (4) .

Grade point policy

Environmental Health and Safety minors must achieve minimum course grades of C+ in all required EHS courses. A final course grade below C+ places a student on probation, which requires a meeting with the program director or a designated representative to discuss a method of remediation. In most cases, the method of remediation involves repeating the course in which the unsatisfactory grade was earned. See repeating courses for additional information.

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 Planning, Implementation, and Evaluation **(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 4000 and WHP 4030 .

Wellness and Health Promotion, B.S.

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). A student completing a required course with a grade below C+, or whose cumulative grade point average in School of Health Sciences courses falls below 2.75, will automatically be considered to be on probation in the program. A subsequent course grade

below C+ will necessitate repeating the course; or a change of major, a decision which will be made in the best interest of the student following consultation with the WHP Coordinator. Before repeating any course, students must consult with the WHP Coordinator. For Wellness and Health Promotion majors who want to register as Certified Wellness Practitioners (CWP) with the National Wellness Institute, a cumulative GPA of 2.75 for the overall degree is required.

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 124 credits, including the following requirements:

1. Meet the university general education requirements

(See Undergraduate degree requirements). Note that several courses under requirement number three below satisfy general education requirements and Wellness and Health Promotion requirements. See courses marked with "*".

2. Complete the university U.S. diversity requirement.

For majors in Wellness and Health Promotion, this requirement is satisfied by completing WHP 3700 Culture, Ethnicity and Well-being **(4)** or HS 3000 Community and Public Health **(4)** .

3. Complete the Wellness and Health Promotion core curriculum credits

- EHS 2550 - Basic Statistics for Health Sciences **(4) *** or STA 2220 Introduction to Statistical Concepts and Reasoning **(4) ***
- EHS 3001 - Global Perspectives of Environmental and Health Sciences **(4) *** or 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 - Health in Personal and Occupational Environments **(4) ***
- HS 2150 - Stress Management **(3)**
- HS 2250 - Research Methods in Health Science **(4)** or PSY 2500 Research Design in Psychology **(4)**

- HS 2500 - Human Nutrition and Health **(4)**
- HS 3400 - Contemporary Topics in Health **(2)**
- HS 4500 - Law, Values and 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)
- PSY 1000 - Introduction to Psychology **(4)** *****
- PSY 3450 - Health Psychology **(4)**
- WHP 2800 - Introduction to Health Literacy **(4)**
- WHP 3000 - Wellness Across the Life Span **(4)**
- WHP 3500 - Health Program Planning, Implementation, and Evaluation **(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 pre-requisite for WHP 3000 , WHP 4000 , WHP 4030 , and WHP 4950 .

4. Complete 21 credit hours of electives

Once students have fulfilled the requirements above, students are required to take 21 credit hours of electives, either from the following recommended courses or students can apply courses taken as part of a minor toward the elective requirements. Recommended courses: AHS 3310 - Health Care Safety (4); AHS 3320 - Delivering Safe Patient Care (4); AHS 3340 - Hospital Safety and Health (4); HS 3350 - Introduction to Environmental Health Sciences (4); WHP 3250 - Issues in Women's Health (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.

Courses

EHS 1000 - Introduction to Environmental Health and Safety (1)
Introduces students to various occupational environments through site visits and/or guest speakers and provides first hand experience of how health and safety professionals function in the workplace.

EHS 1150 - Environmental Health and Safety at Work (2)
A general introduction to Environmental Health Safety in the workplace including injury and illness prevention; hazard identification, assessment and control; emergency response; incident investigation; and safety and health program management. This course is recommended for business, engineering, prelaw, health professions, integrated studies, and occupational safety and health students.

EHS 2250 - Environmental Health and Safety Training Methods (3)
Provides in-depth study of training methods required to conceptualize, prepare, deliver, and evaluate training directed at the adult learner. Course includes hands-on experiences in conducting a training needs assessment, establishing learning objectives, developing curricula, pertinent to needs of participants using different types of media and developing training evaluation tools.

EHS 2350 - Occupational Safety and Health Standards (3)
Current regulations and standards promulgated by the Occupational Safety and Health Administration of the U.S. Department of Labor, with specific emphasis on Michigan safety and health standards.

EHS 2450 - Professional Practice and Leadership Development (3)
The Professional Development course is designed to improve the ability of students to describe their accomplishments and sell their ideas in situations like professional networking, company meetings, response to proposals for services, and interviews.

EHS 2550 - Basic Statistics for Health Sciences (4)
Statistics is the art and science of decision making in the presence of uncertainty. EHS 2550 is an introductory course that assumes no prior knowledge of statistics but does assume some knowledge of high school algebra. The course is designed to introduce students to some of the statistical methods available for the analysis and interpretation of data relevant to environmental health, bio-statistics, natural, physical and socio-behavioral sciences, and health

sciences. Successful completion of college level algebra is encouraged. *Satisfies the university general education requirement in the formal reasoning knowledge foundation area.*

EHS 3001 - Global Perspectives of Environmental and Health Sciences (4)
Explores the global perspective and framework for learning about how social, economic and geopolitical ecology impact environmental health outcomes and occupational safety. The concept of evaluating a broad and dynamic range of emerging strategies and solutions, from community-based monitoring to international considerations of environmental health and safety (EHS) issues. The course satisfies EHS 1000 or EHS 1150 for EHS majors. *Satisfies the university general education requirement in the global perspective knowledge exploration area. Satisfies the university general education requirement for a writing intensive course in general education or the major, not both. Prerequisite for writing intensive: completion of the university writing foundation requirement.*

EHS 3250 - Quantitative Methods for Environmental Health and Safety (4)
Application of frequently applied equations, statistical procedures, and analytical tools used for environmental health and safety assessments. *Satisfies the university general education requirement in the formal reasoning knowledge foundation area.*
Prerequisite(s): STA 2220 or EHS 2550 (C)

EHS 3300 - Safety and Health Administration and Programs (3)
Management aspects of health, safety and industrial environment. Administration techniques, governmental regulations, and programs for environmental health and safety management are discussed.
Prerequisite(s): EHS 2350 (C+). May be taken concurrently.

EHS 3330 - Fire Prevention and Protection (3)
Overview of the characteristic behavior of fire, and human behavior during fire events. Includes a review of important safety science such as heat transfer, prevention and control of fire and explosion hazards, fire emergency planning and management.
Prerequisite(s): EHS 3250 (C+) and EHS 3380 (C+) or instructor permission.

EHS 3350 - Fundamentals of Occupational Hygiene (3)
Principles and practices on the control aspects (engineering, administrative, and personal protection) of chemical, physical and biological hazards in the industrial environment.
Prerequisite(s): CHM 2010 (C); PHY 1200 (C) or PHY 1010 (C); and EHS 3380 (C+)

EHS 3360 - Applied Environmental and Occupational Hygiene with Laboratory (4)

Quantitative monitoring techniques in the recognition, measurement and evaluation of chemical, physical (noise, radiation, extreme thermal conditions, etc.) and biological (blood borne pathogens, allergens, etc.) hazards in the industrial environment. Laboratory included.
Prerequisite(s): EHS 3380 (C+)

EHS 3380 - Environmental Health and Safety Engineering and Technology (3)
Environmental Health and Safety principles and practices in the industrial and community environment. Engineering and technical information are discussed.
Prerequisite(s): EHS 3250 (C+), may be taken concurrently.

EHS 3420 - Advanced Quantitative Methods for Environmental Health and Safety (4)
Provides in-depth application of equations, statistical procedures, and analytical tools for environmental health and safety assessments. Includes discussion of tools for occupational safety and health assessments. Includes discussion of appropriate methods for analyzing deterministic and probabilistic data sets generated from studies in epidemiology, exposure assessment, vapor and particulate transport, and sound-level measurements.
Prerequisite(s): EHS 3250 with a minimum GPA of (C) or higher.

EHS 3510 - Noise Control and Measurement (2)
Study of the impact of noise on the human body and techniques for measuring noise levels. Design of noise controls. Includes discussion of pertinent federal and state regulations concerning noise exposures in workplaces.
Prerequisite(s): EHS 3350 (C) and EHS 3360 (C)

EHS 4230 - Radiation Safety (3)
Safety aspects of occupational hazards associated with the use of ionizing radiation in industry. Methods for the identification, evaluation and control of potential worker overexposure conditions will be reviewed. Biological effects of acute and chronic worker exposure will also be reviewed.
Prerequisite(s): EHS 3350 (C) and EHS 3360 (C)

EHS 4340 - Ventilation and Emerging Technologies (4)
Provides in-depth study and practice of the design and evaluation of ventilation systems used in manufacturing, laboratories, and service/processing environments for removal of harmful airborne vapors and particulate matter.
Prerequisite(s): EHS 3350, EHS 3360 and EHS 3420

EHS 4350 - Radiation Exposure Control (2)

Overview of ionizing and non-ionizing radiation sources, their potential health effects, and their control. Course will also include discussion of electromagnetic fields and radio frequencies in regards to effects on human health.
Prerequisite(s): EHS 3350 (C) and EHS 3360 (C) and EHS 3420 (C)

EHS 4410 - Accident/Incident Investigation and Analysis (3)
A review of methodologies for accident and incident investigation and analysis. Topics include data collection, investigative methodologies, interviewing techniques, techniques of data analysis, reporting formats, systems safety, and developing recommendations to prevent recurrence.
Prerequisite(s): EHS 3250 (C+) and EHS 3380 (C+) or instructor permission.

EHS 4420 - Construction Safety (3)
Construction safety practices and principles with an overview of program development, legislative issues and special concerns of the construction industry with respect to worker safety.
Prerequisite(s): EHS 3380 (C+)

EHS 4430 - Robotic and Automation System Safety Analysis (3)
Information and issues related to worker safety in industrial environments where robots are used. The state-of-the-art of advanced automation will be surveyed, with emphasis on system safety and injury prevention features required to assure an adequate worker/robot interface.
Prerequisite(s): EHS 3250 (C+) and EHS 3380 (C+) or instructor permission.

EHS 4440 - Environmental Standards (3)
Examines air, water, hazardous waste, pesticide and chemical regulatory standards. Topics will be analyzed in terms of standard development, enforcement at state and federal levels, and the validity of the standard's ability to protect health and the environment.
Prerequisite(s): EHS 3330 (C+)

EHS 4450 - Introduction to Ergonomics (3)
Ergonomics and related change management concepts; anthropometry, biomechanics, metabolic energy expenditure, capabilities and limitations of workers; design and analysis of the workplace, hand tools, controls and products; application of the NIOSH lifting guidelines and other standards.
Prerequisite(s): EHS 3380 (C+) and BIO 1002 (C) or BIO 1200 (C) or WHP 4000 (C) and WHP 4030 (C) or BIO 2100 (C) and BIO 2600 (C)

EHS 4460 - Industrial and Environmental Toxicology (3)

Introduction to the basic concepts and techniques of toxicology, with special attention given to the industrial environment. Evaluation of the toxic effects of substances and toxic responses to various substances. Principles of toxicology applied to biological systems: exposure, bio-transformations and mechanisms of toxicity, dose-response relationships and factors influencing toxicity. Identical with ENV 4460. *Satisfies the university general education requirement for a writing intensive course in the major. Prerequisite for writing intensive: completion of the university writing foundation requirement.*
Prerequisite(s): EHS 3380 (C+) and CHM 2010 or CHM 2340

EHS 4500 - Medical Geology (Geo-Medicine) (4)
Introduces students to the emerging concepts of Medical Geology that examines links between geological materials and processes, (elemental abundance interactions and public health) and the incidence of spatial distributions of human diseases in a population.
Prerequisite(s): EHS 3250 (C+) and EHS 4460 (C+), or can be taken per instructor's permission

EHS 4900 - Special Topics in Environmental Health and Safety (2 TO 4)
Instructor initiated research and investigation into current topics of special interest in the career field of Environmental Health and Safety.
Prerequisite(s): program director's permission

EHS 4950 - Environmental Health and Safety Capstone Course Internship (4)
An experiential learning capstone in Env. Health and Safety in close collaboration with professional health and safety practitioners to expose the intern to health and safety problem identification, evaluation, and control and to health and safety program planning and evaluation. May only be taken by students with major standing and minimum (C+) in all EHS courses. Graded S/U. *Satisfies the university general education requirement for the capstone experience.*
Prerequisite(s): program director permission.

EHS 4995 - Directed Study and Research in Environmental Health and Safety (1 TO 4)
Student initiated and problem-oriented independent research and study focusing on Environmental Health and Safety issues. May be repeated for additional credit. Graded S/U.
Prerequisite(s): program director's permission

EHS 4998 - Environmental Health and Safety Research (3)
The course gives students the opportunity for firsthand, supervised research. "Research" in this course will be defined as mentored, but self-directed, activity that allows individual students or a group of students to investigate issues of interest and with proper communication of the results through written and oral presentations.

Prerequisite(s): EHS 3380 (C+) or per adviser's permission (individual project may require specific prerequisites that the research adviser should identify and recommend before the approval to enroll in this class).

WHP 2110 - Community Emergency Response Team (CERT) Preparedness (2)
Concepts, rationale, theory and practical applications of basic citizen preparedness for disaster survival and rescue skills are taught using the Department of Homeland Security CERT curriculum, leading to certification. CERT is designed to prepare individuals to help themselves and the immediate community in the event of a catastrophic disaster. Graded S/U.

WHP 2800 - Introduction to Health Literacy (4)
The course will introduce students to the term health literacy and the expansive application of this concept. The class will assess current levels of health literacy within society and how they apply to concepts like health and risk behavior, health care and health promotion. Students will be introduced to principles and strategies for improving, understanding and showcasing the importance of health literacy and all that it encompasses.

WHP 3000 - Wellness Across the Life Span (4)
Introduces and examines the basic principles which guide growth and development and the health of individuals across the lifespan, from the prenatal period through senescence. Presents methodological, conceptual and substantive issues necessary for understanding and evaluating empirically based information about growth, development and health at different stages of life and from different academic perspectives. Course covers several themes, including contributions of biological and environmental factors to health and human development, measuring the health of individuals in communities, understanding determinants and consequences of health and development across the lifespan and measuring population health.
Prerequisite(s): HS 2000

WHP 3170 - Advanced First Aid/CPR Instruction (2)
Fundamentals of First Aid Instructor training are provided, leading to instructor certification. Students identify appropriate first aid and CPR teaching methods, apply appropriate individual and group learning facilitation skills, and become conversant with the teaching of several advanced first aid and safety modules.
Prerequisite(s): EXS 2700

WHP 3250 - Issues in Women's Health (4)
Examines, medical, sociological, political and financial aspects of women's health issues. Includes an historical look at women's health in the U.S., the roles women have played in health care and the roles of women as health care providers. Cross list with WGS 3890.

WHP 3500 - Health Program Planning, Implementation, and Evaluation (4)
Health program approaches/models/theories, needs analysis, planning, design, development of health promotion programs, equipment choice, and delivery/management and evaluation of health and wellness programs/centers are emphasized. Topics include organizational development, programming, human and financial management, staff selection and development, health, safety, and legal issues.
Prerequisite(s): WRT 1060 and HS 2000

WHP 3600 - Wellness Facilitation (4)
The course examines the development and delivery of presentation material designed to facilitate optimum human interaction in a wellness setting. Students will learn about presentation tools intended to offer experience in delivering effective wellness concepts to difference audiences. Topics include individual and group dynamics, written and oral presentation of wellness related information, nonverbal communication, debate, persuasion, leadership, problem solving, change and conflict.
Prerequisite(s): HS 2000

WHP 3700 - Culture, Ethnicity and Well-being (4)
Interaction between biological, social, political and cultural environments as they affect health, illness, and treatment. Includes historical, organizational, demographic, ecological, behavioral and other factors influencing health and wellness outcomes. *Satisfies the university general education requirement in U.S. diversity.*
Prerequisite(s): HS 2000

WHP 3800 - Persuasion and Marketing in Health Promotion (4)
The course addresses the development of health communication messages, personal branding concepts and critical analysis of persuasion strategies through various communication methods. Students will examine campaigns and social movements to enrich and improve an overall understanding of social marketing and persuasion theories. The class is designed for students to apply marketing public health methodologies through the creation of a service learning based wellness marketing campaign.

WHP 4000 - Assessment and Interventions in Wellness (4)
A systems approach to understanding functional anatomy, physiology and lifestyle issues in relation to disease prevention and wellness. WHP 4030 students learn health risk appraisal and physical assessment techniques that lead to design of intervention strategies for health enhancement and prevention of disease.
Prerequisite(s): HS 2000. Program director permission.

WHP 4030 - Laboratory in Assessment and Interventions (4)
This corequisite course complements WHP 4000 by preparing students for the rigors of implementing health risk appraisals and assessment techniques. Design of intervention strategies for lifestyle and health enhancement and disease prevention are covered.
Prerequisite(s): HS 2000. Program director permission.

WHP 4100 - Advanced Injury Prevention, Control and Safety Promotion (1 TO 4)
Directed study/project covering factors associated with non-industrial events resulting in injury or death, including critical appraisal of intervention strategies, and/or the design and delivery of a comprehensive intervention program.

WHP 4200 - Injury Prevention and the Environment (4)
The interaction of people and the environment is examined relative to injury risk reduction. Physical, psychosocial and environmental challenge factors, including concepts in kinesiology, human-machine interface systems, plus wellness objectives of reduced energy expenditure, enhanced health and safety, and increased productivity and human satisfaction are addressed.

WHP 4310 - Crisis Intervention and Prevention of Self Harm (4)
Provides an introduction to crisis intervention and the prevention of self harm from a health promotion perspective. Cross list with CNS 4040 and EST 5310.
Prerequisite(s): Permission of instructor.

WHP 4320 - Prevention of Injury and Sudden Death in Sport and Physical Activity (SPA) (2)
An examination of unintentional traumatic, non-fatal injuries; plus fatal catastrophic injuries in the athletic population; including epidemiology, etiology, risk factors, prevention, pathophysiology, recognition, assessment, intervention, recovery and return to play factors.
Prerequisite(s): WRT 1060 and HS 2000 or instructor permission.

WHP 4350 - Environmental Justice (4)
This course presents the origins, core concepts, and impacts of the environmental justice movement by examining how race and class interact to produce or sustain health inequities. Students will examine how environmental injustices occur through structural and community factors, consequences to health, and responses to environmental injustice.
Prerequisite(s): HS 2000

WHP 4850 - Population Health, Health Policy, and Healthcare Delivery (4)
Population health, described as the health of groups of individuals within a community, city, county, state, or country, has been placed on the forefront of health care in the United States. This course intends to enhance students' understanding of health issues faced by populations

and collaborative efforts among public health, health care systems, and other organizations to improve health outcomes. Emphasis will be placed on understanding the continuum of care, policy synthesis, evidence-based care, population health research, and patient and community engagement.
Prerequisite(s): HS 2000

WHP 4900 - Special Topics (1 TO 4)
An advanced course involving study of current topics in the practical application of wellness principles. Topics vary. May be repeated for additional credit.
Prerequisite(s): Program director permission.

WHP 4950 - Internship in Wellness and Health Promotion (4)
Supervised general experiences in a variety of wellness educational settings. Students must be approved to attend an internship site prior to registration. A list of approved internship sites is available through the program office. *Satisfies the university general education requirement for the capstone experience.*
Prerequisite(s): HS 2000. Completion of WHP core curriculum and complement credits and program director permission.

WHP 4995 - Directed Study and Research in Wellness, Health Promotion and Injury Prevention (1 TO 4)
Independent problem-directed study and research focusing on wellness, health promotion and injury prevention issues. May be repeated for additional credit.
Prerequisite(s): Program director permission.

Honors College

210 Oak View Hall

(248) 370-4450

Dean: *Graeme Harper, DCA Ph.D. FRGS FRSA FRAI FAIM*

Council: *Amy Banes-Berceli, Biology; Eddie Cheng, Math; Virgil Zeigler-Hill, Psychology; David Kidger, Music; Ji-Eun Lee, Education; Thomas Raffel, Biology; Matthew Fails, Political Science; Sanela Martic, Chemistry/Biochemistry; Brad Roth, Physics; Susan Wood, Art History; Darrin*

Hanna, Engineering; Kathleen Spencer, Nursing; Christopher Wilson, Health Sciences; Fritz McDonald, Philosophy; Karen Conn, Administrative Assistant; Sheri Rourke, Executive Secretary

The Honors College was established to provide highly motivated students an intellectually stimulating community. The curriculum offers a distinctive undergraduate experience that integrates the sciences the professional fields and the arts through research, colloquia, creative activities, scholarly and extra-curricular activities, as well as leadership and service opportunities within the university and larger community. It offers specially designed general education requirements, and in major Honors choices, in conjunction with a departmental major. Students applying to the Honors College must first be admitted to or enrolled at Oakland University. Courses with the HC prefix are open only to students who have been accepted into the Honors College. Please visit our website at oakland.edu for additional information on the Honors College, its programs and requirements.

Requirements and Procedures

Departmental majors

Each student must complete a departmental major in the College of Arts and Sciences or a prescribed course of study in the School of Business Administration, the School of Education and Human Services, the School of Engineering and Computer Science, the School of Health Sciences, or the School of Nursing.

A student who is not pursuing a standard major (for example, a student with an independent major) may be accepted to the Honors College if the Honors College Council determines that the student's program is of sufficient breadth, depth and coherence.

The Honors College also offers a selection of "In Major" Advanced Scholarship courses that can partly take the place of Honors College General Education courses. A list of "In Major" choices is available on The Honors College website or can be discussed with an Honors College adviser.

General education requirements of the honors college:

The Honors College offers selected core general education courses, from this catalog, as designed for student needs or determined by proposals submitted by faculty and accepted by an Honors College committee. Specific offerings for each semester may be found in the Schedule of Classes and on the Honors College website.

The Honors College Council may allow HC courses to satisfy general education requirements by section when the content is appropriate. Course sections must be designated prior to the start of the semester.

1. The student must successfully complete HC 1000 and at least three Honors College core courses (12 credits).

- HC 1000 - First Year Colloquium
- HC 2010 - Art
- HC 2020 - Literature
- HC 2040 - Western Civilization
- HC 2050 - International Studies
- HC 2060 - Social Science
- HC 2070 - Math/Logic or Computer Science
- HC 2080 - Natural Science and Technology

2. The student must complete 8 semesters (once a semester) of Honors College Aspire or Presidential Scholar Aspire. Aspire is a zero credit course that tracks HC activities and reflects them on the students' transcript

3. The student must successfully complete at least one approved General Education Requirements course in each of the 10 knowledge areas that are not covered by the HC core courses taken.

4. The student must complete an approved writing intensive course in General Education Requirements, (which may be satisfied by choosing an HC 2020 course after completion of WRT 1060), a writing intensive course in the major, a diversity course and a capstone. These four requirements may be met by courses that double-count in other general education areas or in the major.

5. The student must complete a four semester foreign language requirement (see policy on the Honors College website).

6. The student must successfully complete HC 3900 in the year before graduation.

7. The student must complete a senior thesis. See Honors College website for deadlines.

Note: Honors College requirements partially replace university general education requirements and replace Exploratory requirements for students in the College of Arts and Sciences.

HC Required Activities

- **Community service:** 10 hours per year
- One HC event per year
- Research & Scholarship sessions- once a year
- Meet with an HC advisor yearly

Good standing

The student must maintain good standing in the Honors College at all times. A copy of "Good Standing Guidelines" is available in the Honors College office or online.

Honors thesis

Each Honors College student will successfully complete a major scholarly work or creative project under the supervision of a faculty mentor. The Honors College Thesis can be awarded as Thesis (Pass), Thesis (with Distinction) or Thesis (with Distinction and a Thesis Award in a particular field). The Honors College thesis/project provides a unique opportunity to work at length on a project designed to contribute to the student's field of expertise and enhance their level of research or creative practice experience. Students complete individual theses, but can choose to work individually or in a team. If graduating in Fall the deadline for submission of The Honors College thesis is October 15. If graduating in Spring the deadline is February 15. Students graduating in Summer have separate deadlines, and should inquire with The Honors College prior to undertaking their thesis/project.

A minimum grade point average of is required for graduation. The diploma indicates that the student is a graduate of The Honors College. Students can apply for an HC thesis research grant to support the completion of their HC thesis at the time the thesis proposal is submitted.

Grade point average and graduation honors

A minimum grade point average of 3.50 is required for graduation. The diploma indicates that the student is a graduate of The Honors College.

Courses

HC 1000 - First Year Colloquium (4)
First year course prepares students to undertake the challenges and responsibilities of an academically prepared Honors College student. Required for all incoming Honors College freshmen in their first semester at Oakland University.

HC 1001 - Honors Aspire I (0)
An introduction to the experiential learning and leadership component of The Honors College.

HC 1100 - Honors Presidential Aspire I (0)
An introduction to the selective Presidential Scholar Success Program, creating an initial professional development plan, making OU Connections and beginning a portfolio on E-space, contacting a national leader in your chosen field.

HC 2002 - Honors Aspire II (0)
The Sophomore Imagination Laboratory and preparing The Honors College students for undergraduate research and service.

HC 2010 - Art (4)

Designed to provide an understanding of how art embodies and reflects particular perceptions and expressions of the world. This course helps students understand and appreciate the beautiful and develop aesthetic criteria whereby to better appreciate art and the way it captures human experience. May be repeated for 4 extra credits. *Satisfies the university general education requirement in the arts knowledge exploration area.*

HC 2020 - Literature (4)
Prepares students with strategies of how to read, understand, and appreciate literary texts. The course also makes it possible for students to enter into a vicarious experience which, as George Eliot puts it, is the most important thing we owe the artist. May be repeated for 4 extra credits. *Satisfies the university general education requirement in the literature knowledge exploration area. Satisfies the university general education requirement for a writing intensive course in general education. Prerequisite for writing intensive: completion of the university writing foundation requirement.*

HC 2040 - Western Civilization (4)
Explores the political, social, economic, and intellectual aspects of Western culture, and how Western culture and ideas have been constituted. May be repeated for 4 extra credits. *Satisfies the university general education requirement in the western civilization knowledge exploration area.*

HC 2050 - International Studies (4)
Examines non-Western culture to show the similarities and differences among cultures. It reads the international scene from its own points of entry and explores how non-western cultures view the West. May be repeated for 4 extra credits. *Satisfies the university general education requirement in the global perspective knowledge exploration area.*

HC 2060 - Social Science (4)
Looks to social science and its particular methods of scientific inquiry. Of particular interest are the ways societal and cultural factors influence and shape individual and/or group behaviors and values. May be repeated for 4 extra credits. *Satisfies the university general education requirement in the social science knowledge exploration area.*

HC 2070 - Math/Logic or Computer Science (4)
Examines systematic and/or creative ways to approach, process, and analyze data and ideas from different disciplines. The course concerns itself with quantifiable evidence and symbolic systems of analysis. May be repeated for 4 extra credits. *Satisfies the university general education requirement in the formal reasoning knowledge foundation area.*

HC 2080 - Natural Science and Technology (4)
Provides students with an introduction into the major fields of natural science and technology. While the natural science focus acquaints students with things pertaining to the natural world, whether biological, physical, chemical, or environmental, the technology focus introduces students to ancient and/or current means of technology. May be repeated for 4 extra credits. *Satisfies the university general education requirement in the natural science and technology knowledge exploration area.*

HC 2200 - Honors Presidential Aspire II (0)
Meeting with a Career Consultant in Career Services, developing and refining résumé, participating in an Academic Service or Volunteer Project, and joining a research, creative or professional internship team.

HC 3003 - Honors Aspire III (0)
Developing independent service, experiential learning, and leadership as upper class students in The Honors College.

HC 3300 - Honors Presidential Aspire III (0)
Undertaking a leadership position on campus, preparing for and presenting research at least one conference, and participating in and hosting a research or other major university event as a co-host or other student leader.

HC 3900 - Introduction to the Thesis (1)
Required for Honors College students in the first semester of their junior year. The course addresses such topics as deriving a thesis statement, researching in the disciplines, research techniques, appropriate documentation and writing the thesis proposal.
Prerequisite(s): minimum of three Honors College courses and completion of language requirement.

HC 4004 - Honors Aspire IV (0)
Culmination of The Honors College service, experiential learning, and leadership, with professional presentation of honors projects.

HC 4400 - Honors Presidential Aspire IV (0)
Completing and critically reviewing a professional portfolio, sending a follow-up communication to a national leader, publicly presenting a report on research and/or service.

HC 4900 - Independent Study (4)

Supervised instruction of the Honors College thesis or independent project. May be repeated for credit. Offered each semester.

School of Nursing

3008 HUMAN HEALTH BUILDING

(248) 370-4253

Fax: (248) 364-8740

Dean: *Judy Didion*

Associate Dean: *Gary Moore*

Office of the Dean: *Patrina Carper, senior academic adviser; Laura Christensen Saims, academic adviser; Kristen Cometto, major gift officer; Joann Denby, technical support coordinator; Sonya Gary, director of clinical services; Amy Johnson, administrative project coordinator; Kenyettera Junior, business manager/financial analyst; Sarah Mullin, senior academic adviser; Jason Pennington, director of advising; Teresa Rodges, executive director of continuing education; Michele St. Denis, assistant dean; Emily Stepanian-Bennett, academic adviser; April Thomas-Powell, academic adviser; Thomas Yoder, information technology specialist*

Professors Emerita: *Frances Jackson, Mary Mittelstaedt, Justine Speer, Diane Wilson, Carol Zenas*

Professors: *Judy Didion, Karen Dunn, Suha Kridli, Barbara Penprase*

Maggie Allesee Endowed Professor in Gerontology: *Karen Dunn*

Crittenton Hospital Medical Center Endowed Professor: *Barbara Penprase*

Associate Professors: *Carrie Buch, Judith Fouladbakhsh, Claudia Grobbel, Margaret Harris, Zorica Kauric-Klein, Julie Kruse, Anne Mitchell, Gary Moore, Sarah Newton, Laura Pittiglio*

Assistant Professors: *Margaret Glembocki, Mary Golinski, Deana Hays, Joanna Hernandez, Anne Hranchook, Cheryl Jusela, Kristen Munyan, Julia Paul, Patricia Petroulias, Lan Yao*

Adjunct Assistant Professors: *Lynda Poly-Droulard*

Adjunct Instructors: *Teresa Chahine, Nicole Clark, Ellen Gajewski, Kimberly Holka, Margaret Kennedy, Colleen Meade Ripper, Renee Mirovsky, Katie Mysen*

Visiting Instructors: *Carly Miller*

Special Instructors: *Janith Beres, Kelly Berishaj, Carolyn Kollar-Tieppo, Kathleen Spencer, Stephanie Vallie*

Director of Nursing Laboratories: *Patricia Ketcham*

Focus Hope: C*heniece Lyons*

Board of Visitors

The School of Nursing (SON) Board of Visitors (BOV) is composed of community leaders from the greater Detroit area. The SON Dean consults with the BOV as needed, the BOV assists the SON with fundraising, and members of the BOV provide generous scholarships for students.

Members of the Board of Visitors are:

Maggie Allesee, Counselor

Maureen Bowman, MA, BSN, RN, NEA-BC, Vice President & Chief Nursing Officer, Beaumont Health-Royal Oak

Douglas Dascenzo, MSN, RN, Chief Nursing Officer, St. Joseph Mercy Oakland

Shukri David, M.D., FACC, Section Chief for the Division of Cardiology at Providence Hospital and Medical Centers and Medical Director of the Heart & Vascular Center of Excellence at St. John Providence Health System

Judy Didion, PhD, RN, Dean, School of Nursing

Tamika Frimpong, Esq., Legal Director/HR, Nexteer Automotive

Debbie Guido-Allen, MBA, BSN, RN, NE-BC, Vice President and Chief Nursing Officer-Nursing Support Services,Beaumont Health-Troy

Adreena Harley, MSN, NE-BC,Volunteer

Karen Harris, MSN, RN, WHNP-BC, Vice President of Patient Care Services/Chief Nursing Officer, Henry Ford West Bloomfield Hospital

Gregory Jamian, BA, President & CEO, AmeriCare Medical, Inc.

Chris Johnson, BS, Consultant

Shawn Levitt, BSN, MBA, MHSA, RN, FACHE, CPHQ, Senior VP and Market Chief Nursing Officer

Denise McLean, RN, MSN, VP of Nursing, Providence-Providence Park Hospitals

Kathleen M. Ryan, RN, MHSA, Vice Chair West Region Board of Trustees for Ascension-St. John Providence Health System

Sandra Schmitt, RN, BSN, Manager, Nursing Development & Clinical Outreach, Beaumont Health

Michelle Seid, RN, BSN, Volunteer

Nancy Susick, RN, MSN, NE-BC, Senior Vice President, Beaumont Health System, and President, Beaumont Health-Troy

Christine Zambricki, CRNA, RN, FAAN, Chief Executive Officer of America's Blood Centers

Accreditation and Program Review

The Oakland University (OU) School of Nursing (SON) undergraduate program is fully accredited by the Commission on Collegiate Nursing Education, One Dupont Circle, NW, Suite 530, Washington, DC 20036, (202) 887-6791 and is approved by the Michigan State Board of Nursing. The BSN Degree Completion Sequence is fully accredited as an online program by the Higher Learning Commission of the North Central Association.

Programs Offered

The School of Nursing offers programs of study leading to the Bachelor of Science in Nursing (BSN) degree, Master of Science in Nursing (MSN) degree, and a Doctor of Nursing Practice (DNP) degree. The undergraduate program curriculum builds on a foundation of the arts, sciences, and humanities. Graduates of the undergraduate program pre-licensure tracks (Basic-BSN and Accelerated Second Degree BSN) are eligible to take the NCLEX-RN licensure examination. The undergraduate program prepares students for graduate study in nursing.

School of Nursing Mission

The mission of the OU School of Nursing is to prepare transformational leaders committed to caring and using the best evidence in nursing practice, education and research to optimize the health of the public in a diverse ever-changing global society.

School of Nursing Vision Statement

The faculty and graduates of the OU School of Nursing will be recognized as transformational leaders, caring practitioners and scholars who optimize the health and well-being of a diverse global society.

Baccalaureate Program Curriculum Outcomes

The BSN Program Curriculum is based on professional forces; the vision, mission, and values of the faculty; prepares the graduate to practice in a diverse global society; and to:

1. Apply concepts from the Arts and Sciences in the promotion of health and the management of simple to complex nursing care.
2. Demonstrate use of the nursing process in clinical decision-making.
3. Apply principles of patient safety and quality improvement in nursing practice.
4. Apply principles of wellness, health promotion, disease prevention, rehabilitation, risk reduction, palliative and end-of-life care to individuals, families, communities, and populations.
5. Demonstrate values-based, ethical professional behaviors that integrate caring, autonomy, integrity, social justice, respect for diversity and human dignity throughout the lifespan.
6. Use best-evidence in nursing practice.
7. Demonstrate inter/intra-professional collaboration to optimize health outcomes.
8. Demonstrate transformational leadership in nursing practice in a variety of settings.
9. Use knowledge, processes, and skills from informatics to inform clinical decisionmaking.
10. Apply knowledge of health policy, economics, legal, and political principles to nursing practice.
11. Demonstrate a commitment to professional development and lifelong learning.

Admission to the Undergraduate Program

Program: Requirements for the Bachelor of Science in Nursing (BSN) Degree

Admission to the undergraduate program occurs in one of four ways: (1) through direct admission to the Basic-BSN track during the student's senior year of high school; (2) on a competitive basis to the Basic-BSN track following successful completion of the pre-requisite courses; (3) on a competitive basis to the Accelerated Second Degree BSN track following successful completion of the pre-requisite courses; and (4) as a registered nurse with an associated degree to the BSN degree completion sequence. Students admitted to the SON undergraduate program are expected to complete all required nursing courses at OU. Applicants with disabilities will be considered for admission to the SON undergraduate program on an individual basis related to their ability to satisfy the SON core performance standards.

Transfer Credit

For SON admission purposes, grades for courses taken at other academic institutions will be used to calculate a student's pre-nursing GPA. Letter grades are converted as follows: A = 4.0, A- = 3.7, B+ = 3.3, B = 3.0. Course grades that transfer in to OU do not appear on the OU transcript.

Direct admission to the basic-BSN track immediately following high school

Direct Admission to the SON undergraduate program Basic-BSN track is for high-achieving high school students. Direct Admission students are required to attend OU full-time. During their first year at OU, Direct Admission students take all of the Basic-BSN prerequisite courses.

High school seniors who wish to be eligible for the SON undergraduate program Basic-BSN track by Direct Admission must satisfy the following requirements:

1. A high school grade-point average (GPA) of 3.5 or higher following the Junior year (after six academic semesters);
2. An ACT English score of 24 or higher or SAT equivalent;
3. An ACT Math score of 24 or higher or SAT equivalent;
4. An ACT Reading score of 24 or higher;
5. An ACT Science score of 24 or higher; OR SAT score of 1110 Critical Reading + Math and SAT score of 550 Writing; and
6. At least two academic semesters of high school Biology and Chemistry completed prior to the senior year with a final course grade of B or higher.
7. Apply for admission to OU by November 1st of their senior year of high school. The OU application is the application used by the SON to select students for Direct Admission.

Completion of the minimum requirements does not guarantee admission to the SON as a Basic-BSN Direct Admission student.

In order to retain your seat in the Direct Admit Basic-BSN track, students must meet the minimum grade requirements for admission to the School of Nursing. Any Direct Admission student who does not successfully complete all of the first year academic requirements will forfeit his/her seat. Students who forfeit their Direct Admission seat will need to re-apply to the SON Basic-BSN track on a competitive basis following successful completion of the Basic-BSN admission requirements.

Admission to the basic BSN track on a competitive basis following completion of the required pre-requisite courses

Program: Sample Schedule for the Basic-BSN Track

Students who wish to apply to the undergraduate program Basic BSN track on a competitive basis must first satisfy the following minimum requirements:

1. Complete BIO 1200, BIO 1006; CHM 1040, CHM 2010, and PSY 1000 with a minimum grade of B in each course and a minimum overall GPA of B for these five (5) courses.
2. Complete one philosophy course (PHL 1100, PHL 1000, PHL 1300, PHL 1070, PHL 2200, PHL 2210, or PHL 2220 are recommended) with a minimum grade of B.
3. Complete WRT 1060 with a minimum grade of B.
4. Complete MTH 0661 with a minimum grade of B. (The MTH requirement is waived for students who receive a score of 18 or higher on the mathematics subsection of the American College Test (ACT) or SAT equivalent, who have taken an Oakland University placement test and placed into MTH 0662 or higher, or who successfully completed a higher MTH course with a final course grade of B or higher)

Completion of the minimum requirements does not guarantee admission to the Basic-BSN track.

Applicants to the SON undergraduate program must be in good academic standing in the university. Additional consideration is given to applicants who complete five or more of the required pre-requisite courses (excluding MTH 0661) at Oakland University. For admission purposes, Basic-BSN pre-requisite courses that are satisfied by Advanced Placement (AP) or International Baccalaureate (IB) courses will count as courses taken at Oakland University. Please refer to the OU AP and IB policies for approved equivalents. Lastly, applicants who have been dismissed from a nursing program or who have ever received two (or more) grades in nursing courses below B- must submit a statement of explanation that includes their current status as a nursing student at the other nursing program before they will be considered for admission to the SON Basic-BSN track.

Admission to the accelerated second-degree BSN track

Program: Sample Schedule for the Accelerated Second Degree BSN Track

Students who wish to apply to the undergraduate program Accelerated Second Degree (ASD) BSN track are first required to apply to OU as a pre-accelerated second degree student. Following admission to OU as a pre-accelerated second degree student, the following minimum requirements (items 1-3) must be satisfied before students may apply to the ASD track:

1. Adhere to the Oakland University undergraduate admission requirements for a second degree student.
2. Complete BIO 1200, BIO 1006 ,CHM 1040, CHM 2010, and PSY 1000 with a minimum grade of B in each course and a minimum overall GPA of B.
3. Complete one philosophy course (PHL 1100, PHL 1000, PHL 1300, PHL 1070, PHL 2200, PHL 2210, or PHL 2220 are recommended) with a minimum grade of B.
4. PSY 2250 and BIO 3520 with a grade of B or higher on the first attempt.

5. NRS 2021, NRS 2011, and NRS 3041 with a grade of B or higher on the first attempt.

When students satisfy items 1-3, they may apply to the SON for admission to the ASD track. Applicants who have been dismissed from a nursing program or who have ever received two (or more) grades in nursing courses below B must submit a statement of explanation that includes their current status as a nursing student at the other nursing program before they will be considered for admission to the SON.

Completion of the minimum requirements does not guarantee admission to the accelerated second degree BSN track.

Students are conditionally admitted to the ASD track with full admission pending successful completion of items 4-5. Conditionally admitted pre-ASD students must attain a final course grade of B- or higher on the first attempt in NRS 2021 , NRS 2011, NRS 3041, PSY 2250 and BIO 3520 . If the final course grade in any of these courses is less than B-, admission to the ASD track is forfeited, and the student is not eligible to re-apply to the SON ASD track. The student may apply to the SON Basic-BSN track on a competitive basis, but if admitted, he/she will enter the SON on probation.

Admission to the BSN degree completion sequence for registered nurses

Program: Sample Schedule for RN-BSN Degree Completion Sequence for Registered Nurses

The School of Nursing offers a BSN degree completion sequence for registered nurses with an Associate Degree (ADN) and who possess a valid and unrestricted RN license. A cumulative GPA of 2.5 or higher from the student's ADN program is required for admission to the BSN degree completion sequence.

Undergraduate Program Policies and Procedures

Students admitted to the SON undergraduate program should consult the SON Undergraduate Program Student Handbook for information regarding program policies and procedures.

Academic Advising

All newly admitted undergraduate students are required to attend a mandatory SON orientation. Students are encouraged to meet regularly with their academic advisers to discuss academic issues and/or concerns.

Clinical Health Requirements for BSN Students

A student's ability to start and/or remain in the pre-licensure (Basic-BSN and ASD) nursing curricula is contingent upon successful completion of all of the SON clinical health requirements. Newly admitted pre-licensure students who do not submit the required clinical health documentation by the published due date will forfeit their seat and will need to re-apply. Continuing students who do not submit the required clinical health documentation by the published due date will not be allowed to enroll in any clinical nursing courses and the corresponding didactic course(s), and their progression in the nursing curriculum may be delayed. The SON clinical health requirements are available on the SON website. In addition, a criminal background check and a urine drug screen are required for admission to the SON. A positive criminal background check and/or drug screen may prevent admission to the SON. Students are responsible for all costs associated with the SON clinical health requirements. Students are encouraged to maintain their own health insurance. Please note that payment for injury or illness that occurs while in the nursing program will be the responsibility of the student.

Clinical Placements

The SON provides students with a range of clinical experiences with diverse populations, organizations, and agencies. The SON's clinical partners are located in urban and suburban settings throughout metropolitan Detroit and southeastern Michigan. Each student is responsible for providing his/her own transportation to all clinical experiences.

Student Nursing Organizations

Sigma Theta Tau International -Theta Psi Chapter (STTI)

The OU chapter of Sigma Theta Tau International, Theta Psi, was chartered in April 1986. Each year SON students who are eligible are invited to become members of this international nursing honor society. Candidates for membership are selected on the basis of superior scholastic achievement.

Student Nurses Association of Oakland University (SNAOU)

Nursing students are eligible for and encouraged to become members of the SNAOU. This organization provides undergraduate nursing students the opportunity to interact with other nursing students, engage in professional nursing activities, and network with SON faculty and administrators.

Black Student Nurses Association (BSNA)

The purpose of this organization is to give SON undergraduate students an opportunity to promote unity among minorities and other students by providing a support network for pre-

nursing and current nursing students. BSNA allows members to increase their professional networking skills and help educate and inform the community about health issues that affect minorities.

Leave of Absence

Students can request a leave of absence (LOA) in the SON for personal or academic reasons for a total of 12 months. Students who wish to take a LOA in the SON must meet with their SON academic adviser. A student's return from a LOA is contingent upon availability of space. Students who return from LOA must comply with all SON policies in effect at the time they return and their clinical health requirements must be current with the SON.

Withdrawal

Students can withdraw from the SON for personal or academic reasons. Students who wish to withdraw from the SON must contact their SON academic adviser and submit a SON Withdrawal form.

Qualification for Registered Nurse Licensure

Registered Nurse licensure is granted by the State of Michigan. Requirements for licensure include successful completion of a state-approved nursing educational program and satisfactory performance on the National Council of State Boards of Nursing Licensing Examination for Registered Nurses (NCLEX-RN). Licensure in one state entitles a qualified holder to seek licensure by endorsement in another state.

Schedule of Classes

Specific offerings for each semester may be found in the Schedule of Classes.

Programs

- Requirements for the Bachelor of Science in Nursing (BSN) Degree
- Sample Schedule for RN-BSN Degree Completion Sequence for Registered Nurses
- Sample Schedule for the Accelerated Second Degree BSN Track
- Sample Schedule for the Basic-BSN Track

Requirements for the Bachelor of Science in Nursing (BSN) Degree

Students in the SON 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.

Sample Schedule for RN-BSN Degree Completion Sequence for Registered Nurses

Semester 1 - 13 credits

- NRS 3022 - Informatics for Nursing Practice **(2)**
- NRS 3511 - Transition to Baccalaureate Nursing Education **(4)**
- NRS 3531 - Health Promotion in the Community **(4)**
- NRS 3071 - Research Basis of Nursing Practice **(3)**

Semester 2 - 15 credits

- NRS 3541 - Nursing Leadership and Health Care Issues **(3)**
- NRS 4551 - Nursing Care of Populations with Health Disparities **(4)**
- NRS 4561 - Community Nursing **(4)**
- NRS 4571 - Nursing Synthesis **(4)**

Semester 3 - 4 credits

- NRS 4585 - Nursing Capstone Experience **(4)**

University Transfer policy

Students admitted to OU SON from a regionally accredited Associate Degree Program (ADN), meeting Michigan Transfer Agreement (MTA) requirements, may transfer a maximum of 63 credits as established by University Transfer policy. If transferring in without the completion of the MTA, please reference the General Education Transfer Guid for course that satisfy individual categories.

Additional 30 Prior Learning credits

Additional 30 prior learning credits awarded for successful completion of the NCLEX-RN.

Part time Plan of Study

Part time Plan of Study available with academic adviser.

32 total credits

Sample Schedule for the Accelerated Second Degree BSN Track

Students admitted to the Accelerated Second Degree BSN track will follow the plan of study shown below:

Semester 1 - 17 credits

- NRS 2311 - Introduction to Professional Nursing Practice **(4)**
- NRS 2313 - Nursing Practice Concepts **(2)**
- NRS 2321 - Health Assessment Across the Life Span **(3)**
- NRS 2323 - Health Assessment Across the Life Span Lab **(1)**
- NRS 2325 - Basic Clinical Competencies **(2)**
- NRS 2411 - Comprehensive Adult Nursing I **(3)**
- NRS 2415 - Comprehensive Adult Nursing I: Clinical **(2)**

Semester 2 - 18 credits

- NRS 3071 - Research Basis of Nursing Practice **(3)**
- NRS 3311 - Comprehensive Adult Nursing II **(3)**
- NRS 3315 - Comprehensive Adult Nursing II Clinical **(2)**
- NRS 3321 - Nursing Care of the Childbearing Family **(3)**
- NRS 3325 - Nursing Care of the Childbearing Family: Clinical **(2)**
- NRS 3331 - Nursing Care of Children **(3)**
- NRS 3335 - Nursing Care of Children: Clinical **(2)**

Semester 3 - 15 credits

- NRS 4345 - Mental Health Nursing **(4)**
- NRS 4061 - Community Nursing **(3)**
- NRS 4321 - Nursing Leadership and Health Care Issues **(2)**
- NRS 4325 - Nursing Synthesis Clinical **(5)**
- NRS 4331 - Nursing Synthesis **(1)**

50 total credits

Sample Schedule for the Basic-BSN Track

Plan of study for the Basic BSN track

Students admitted to the Basic-BSN track will follow the plan of study shown below:

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 1006 - Clinical Anatomy and Physiology **(5)**
- CHM 2010 - Introduction to Organic and Biological Chemistry **(4)**
- WRT 1060 - Composition II **(4)**
- (Select one) PHL 1100, PHL 1000, PHL 1300, PHL 1070, PHL 2200, PHL 2210, PHL 2220 **(4)**

Nursing Semester 1 - 14 credits

- NRS 2012 - Introduction to Professional Nursing **(3)**
- NRS 2014 - Health Assessment **(4)**
- NRS 2010 - Pathophysiology **(3)**

- BIO 3520 - Introduction to Human Microbiology **(4)**

Nursing 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

Nursing Semester 3 - 17 credits

- NRS 3015 - Nursing Care of Adults I **(5)**
- NRS 3016 - Nursing Care of Individuals with Behavioral and Mental Health Disorders **(5)**
- NRS 3012 - Research for Evidence-Based Nursing Practice **(3)**

  General Education

Nursing Semester 4 - 16 credits

- NRS 3025 - Nursing Care of Adults II **(5)**
- NRS 3026 - Nursing Care of the Childbearing Family **(5)**
- NRS 3022 - Informatics for Nursing Practice **(2)**

  General Education

Nursing Semester 5 - 16 credits

- NRS 4015 - Nursing Care of Communities and Populations **(5)**
- NRS 4016 - Nursing Care of the Childrearing Family **(5)**
- NRS 4012 - Nursing Leadership **(2)**

  General Education

Nursing Semester 6 - 12 credits

- NRS 4026 - Nursing Capstone **(5)**

NRS XXXX - Nursing Elective
General Education

125 total credits

Note

General Education Requirements may be taken in any semester throughout the nursing curriculum. Students are encouraged to consult with an academic adviser for assistance in selecting and scheduling general education courses. In some instances, students may select one course to fulfill more than one degree requirement.

Courses

NRS 0011 - Mathematics of Medication Administration 1 (1)
This remedial course focuses on the use of mathematics associated with safe medication calculation and administration in clinical nursing practice.

NRS 2010 - Pathophysiology (3)
This course focuses on the altered processes of human physiology. An emphasis is placed on exploring changes of biological process of the body and the effects on homeostasis.

NRS 2011 - Pathophysiology (3)
This course explores biological and physiological deviations that can occur throughout the lifespan.
Pre/Corequisite(s): BIO 3520

NRS 2012 - Introduction to Professional Nursing (3)
This course provides an introduction to the theoretical foundations of the nursing profession.

NRS 2014 - Health Assessment (4)
This course prepares students to perform comprehensive health assessments. Laboratory experiences provide students with opportunities to practice assessment skills.

NRS 2020 - Pharmacology (4)
This course provides an introduction to the principles of pharmacology, including pharmacokinetics, pharmacodynamics, and medication interactions.
Prerequisite(s): BIO 3520, NRS 2010, NRS 2012, NRS 2014

NRS 2021 - Nursing Informatics (2)

This course introduces students to basic healthcare informatics' topics, tools, and techniques and provides students with the foundational knowledge needed to use information management and patient care technologies to deliver safe and effective care.
Prerequisite(s): Basic-BSN and Accelerated Second Degree = NRS 2011
BSN Degree Completion sequence:
Pre/Corequisite(s): NRS 3511

NRS 2024 - Fundamentals of Professional Nursing Practice (5)
This course focuses on the application of concepts foundational to professional nursing practice, including therapeutic nursing interventions.
Prerequisite(s): BIO 3520, NRS 2010, NRS 2012, NRS 2014

NRS 2031 - Pediatric Pathophysiology (1)
This course explores biological and physiological deviations that occur in the pediatric population. It is designed to supplement a NRS 2011 equivalent course that does not include pediatric content.

NRS 2111 - Introduction to Professional Nursing Practice (2)
This course introduces students to concepts related to professional nursing practice, including professional values and therapeutic communication.
Prerequisite(s): admission to the School of Nursing.

NRS 2123 - Nursing Therapeutics I (1)
This course involves theory and application in the laboratory setting of basic theoretical principles and therapeutic interventions used in professional nursing practice.
Prerequisite(s): admission to the School of Nursing.

NRS 2131 - Health Assessment (3)
This course focuses on the role of the professional nurse in performing a holistic health assessment/physical examination and use of effective therapeutic communication with individuals across the lifespan.
Corequisite(s): NRS 2133
Pre/Corequisite(s): PSY 2250 , NRS 2111

NRS 2133 - Health Assessment Laboratory (1)
This course involves application in the laboratory setting of principles related to health assessment.
Prerequisite(s): admission to the School of Nursing.
Corequisite(s): NRS 2131

NRS 2143 - Nursing Therapeutics II (2)
This course builds on the concepts taught in NRS 2123 and involves theory and application in the laboratory setting of basic theoretical principles and therapeutic interventions used in professional nursing practice.
Prerequisite(s): NRS 2111, NRS 2123, NRS 2131, NRS 2133, NRS 2165, NRS 2171, NRS 2181
Corequisite(s): NRS 2231, NRS 2235
Pre/Corequisite(s): NRS 2021, NRS 2011

NRS 2165 - Basic Clinical Competencies I (1)
This course involves application of basic theoretical principles and therapeutic nursing interventions in clinical settings appropriate to preschool aged children to adolescents.
Pre/Corequisite(s): PSY 2250, NRS 2111, NRS 2123, NRS 2131, NRS 2133, NRS 2171, and NRS 2181

NRS 2171 - Health Promotion I (3)
This course explores wellness and health promotion from a nursing perspective during prenatal through adolescence.
Corequisite(s): NRS 2165

NRS 2181 - Scientific Foundations of Professional Nursing Practice (2)
The course introduces students to the scientific foundations of professional nursing practice, including use of the nursing process.
Corequisite(s): NRS 2123, NRS 2131, NRS 2133, NRS 2165, NRS 2171
Pre/Corequisite(s): NRS 2111 and PSY 2250

NRS 2231 - Health Promotion II (3)
This course explores wellness and health promotion from a nursing perspective for adults and the elderly. *Satisfies the university general education requirement in U.S. diversity.*
Prerequisite(s): NRS 2111, NRS 2123, NRS 2131, NRS 2133, NRS 2165, NRS 2171, NRS 2181
Corequisite(s): NRS 2235
Pre/Corequisite(s): NRS 2021, NRS 2011

NRS 2235 - Basic Clinical Competencies II (2)
This course involves application of basic theoretical principles and therapeutic nursing interventions in clinical settings appropriate to adults and the elderly.
Prerequisite(s): NRS 2111, NRS 2123, NRS 2131, NRS 2133, NRS 2165, NRS 2171, NRS 2181
Corequisite(s): NRS 2231
Pre/Corequisite(s): NRS 2021, NRS 2011

NRS 2311 - Introduction to Professional Nursing Practice (4)
This course introduces students to the scientific basis of nursing and the application of the nursing process. This course is reserved for students admitted to the ASD track.
Prerequisite(s): admission to the School of Nursing.
Corequisite(s): NRS 2313

NRS 2313 - Nursing Practice Concepts (2)
This course involves theory and application in the laboratory setting of basic theoretical principles and therapeutic interventions used in professional nursing practice. This course is reserved for students admitted to the ASD track.
Corequisite(s): NRS 2311

NRS 2321 - Health Assessment Across the Life Span (3)
This course focuses on the role of the professional nurse in performing a holistic health assessment/physical examination and use of effective therapeutic communication with individuals across the lifespan.
Corequisite(s): NRS 2323

NRS 2323 - Health Assessment Across the Life Span Lab (1)
This course involves application in the laboratory setting of principles related to health assessment. This course is reserved for students admitted to the ASD track.
Prerequisite(s): Admission to the School of Nursing.
Corequisite(s): NRS 2321

NRS 2325 - Basic Clinical Competencies (2)
This course involves the clinical application of basic nursing theory and nursing interventions to the care of adults and older adults in the acute care setting. This course is reserved for students admitted to the ASD track. Students are required to successfully complete NRS 2313, NRS 2321, and NRS 2323 in the first seven weeks of the semester to progress to NRS 2325 in the second seven weeks of the semester.
Corequisite(s): NRS 2411

NRS 2411 - Comprehensive Adult Nursing I (3)
This course integrates theory, research, and specific nursing interventions for nursing care of adults and older adults and their families. This course is reserved for students admitted to the ASD track. Students are required to successfully complete NRS 2313, NRS 2321, and NRS 2323 in the first seven weeks of the semester to progress to NRS 2325 in the second seven weeks of the semester.
Corequisite(s): NRS 2325

NRS 2415 - Comprehensive Adult Nursing I: Clinical (2)
This course involves the clinical application of theory, research and specific nursing interventions with a focus on adults and older adults, and their families. This course is reserved for students admitted to the ASD track. Students are required to successfully complete NRS 2313, or NRS 2321, and NRS 2323 in the first seven weeks of the semester to progress to NRS 2325 and NRS 2415 in the second seven weeks of the semester.
Corequisite(s): NRS 2411

NRS 2900 - Topics in Nursing (1 TO 2)
Presents special topics or areas of nursing that students may wish to develop. Clinical experiences in a health care facility may be required.
Prerequisite(s): admission to the School of Nursing or permission of instructor.

NRS 2910 - Human Trafficking: Modern Day Slavery (1 TO 2)
This seven-week online course will provide the nursing student with an overview of human trafficking: what it is, the magnitude of the problem locally, nationally and internationally, and the nurse's role in the interprofessional fight against human trafficking.

NRS 3012 - Research for Evidence-Based Nursing Practice (3)
This course prepares the baccalaureate student for evidence-based nursing practice.
Prerequisite(s): NRS 2024

NRS 3015 - Nursing Care of Adults I (5)
This course focuses on the care of adult patients with medical and/or surgical health alterations. Emphasis is placed on care of patients with alterations in selected body systems.
Prerequisite(s): PSY 2250, NRS 2020, NRS 2024

NRS 3016 - Nursing Care of Individuals with Behavioral and Mental Health Disorders (5)
This course focuses on the care of patients across the lifespan experiencing cognitive, mental and behavioral disorders. Emphasis is placed on management of patients facing emotional and psychological stressors and promoting mental health.
Prerequisite(s): PSY 2250, NRS 2020, NRS 2024

NRS 3022 - Informatics for Nursing Practice (2)
This course focuses on information technology, quality care and outcomes, and professional nursing practice.
Prerequisite(s): NRS 3015

NRS 3025 - Nursing Care of Adults II (5)

This course focuses on the care of adult patients with medical and/or surgical health alterations. Emphasis is placed on care of patients with alterations in selected body systems.
Prerequisite(s): NRS 3015, NRS 3016

NRS 3026 - Nursing Care of the Childbearing Family (5)
This course provides an integrative, family-centered approach to the care of childbearing families through integration of theory, rationale, and evidence-based nursing practice.
Prerequisite(s): NRS 3015, NRS 3016

NRS 3041 - Pharmacology in Nursing (3)
This course explores pharmacological interventions and their rationale for professional nursing practice.
Prerequisite(s): NRS 2011

NRS 3051 - Global Health (2)
This course provides a basic level perspective of global health issues and policies. Geographical regions and current world events are used to provide students with examples of complex issues such as infections, diseases, nutrition, and environmental health. Life span health issues are analyzed from a global perspective.
Prerequisite(s): NRS 2011

NRS 3071 - Research Basis of Nursing Practice (3)
This course focuses on the research process and evidence-based practice as they relate to professional nursing. *Satisfies the university general education requirement for a writing intensive course in the major. Prerequisite for writing intensive: completion of the university writing foundation requirement.*
Prerequisite(s): Basic-BSN, NRS 2181; ASD NRS 2311, NRS 2411, NRS 2415 BSN degree completion sequence NRS 3511

NRS 3081 - Human Sexuality (4)
This course will apply knowledge from the natural and social sciences to address issues, concerns, varying perspectives, and phenomena associated with human sexuality. *Satisfies the university general education requirement in the knowledge application integration area and in U.S. diversity. Prerequisite for knowledge application: completion of the general education requirement in the natural science and technology or social science knowledge exploration areas, not both. Students completing other general education core courses may take this course with permission of the instructor.*

NRS 3251 - Nursing Care of Adults (3)

This course integrates theory, research, and specific nursing interventions for ill adults and older adults, and their families.
Prerequisite(s): NRS 2143, NRS 2021, NRS 2011, NRS 2231, NRS 2235, BIO 3520
Corequisite(s): NRS 3255
Pre/Corequisite(s): NRS 3041

NRS 3255 - Nursing Care of Adults: Clinical (2)
This course involves the clinical application of theory, research, and specific nursing interventions with a focus on adults and older adults, and their families.
Prerequisite(s): BIO 3520, NRS 2143, NRS 2021, NRS 2011, NRS 2231, NRS 2235
Corequisite(s): NRS 3251
Pre/Corequisite(s): NRS 3041

NRS 3261 - Nursing Care of Children (3)
This course integrates theory, research, and specific nursing interventions with a focus on children and adolescents.
Prerequisite(s): NRS 3041, NRS 3251, NRS 3255, NRS 3071
Corequisite(s): NRS 3265

NRS 3265 - Nursing Care of Children: Clinical (2)
This course involves the clinical application of theory, research, and specific nursing interventions with a focus on children and adolescents.
Prerequisite(s): NRS 3041, NRS 3251, NRS 3255 and NRS 3071
Corequisite(s): NRS 3261

NRS 3271 - Nursing Care of Childbearing Family (3)
This course integrates theory, research, and specific nursing interventions with a focus on the childbearing family.
Prerequisite(s): NRS 3041, NRS 3251, NRS 3255, and NRS 3071
Corequisite(s): NRS 3275

NRS 3275 - Nursing Care of the Childbearing Family: Clinical (2)
This course involves the clinical application of theory, research, and specific nursing interventions with a focus on the childbearing family.
Prerequisite(s): NRS 3041, NRS 3251, NRS 3255 and NRS 3071
Corequisite(s): NRS 3271

NRS 3281 - Nursing Leadership and Health Care Issues (2)

This course presents the principles of nursing leadership and management, health policy, and legal and ethical issues in professional nursing practice.
Prerequisite(s): NRS 3041, NRS 3251, NRS 3255, and NRS 3071

NRS 3311 - Comprehensive Adult Nursing II (3)
This course integrates theory, rationale, and specific nursing interventions for adults and older adults with chronic and complex health conditions. The focus will be on both physiological and psychobiological conditions. This course is reserved for students admitted to the ASD track.
Prerequisite(s): NRS 2311, NRS 2411, NRS 2415
Corequisite(s): NRS 3315

NRS 3315 - Comprehensive Adult Nursing II Clinical (2)
This course involves the clinical application of theory, research and specific nursing interventions with a focus on adults and older adults with chronic and complex health conditions. This course is reserved for students admitted to the ASD track.
Prerequisite(s): NRS 2311, NRS 2411, NRS 2415
Corequisite(s): NRS 3311

NRS 3321 - Nursing Care of the Childbearing Family (3)
This course integrates theory, research, and specific nursing interventions for nursing care of childbearing families. This course is reserved for students admitted to the ASD track.
Prerequisite(s): NRS 2311, NRS 2411, NRS 2415
Corequisite(s): NRS 3325, NRS 3331

NRS 3325 - Nursing Care of the Childbearing Family: Clinical (2)
This course involves the clinical application of theory, research and specific nursing interventions with a focus on the childbearing family. This course is reserved for students admitted to the ASD track.
Prerequisite(s): NRS 2311, NRS 2411, NRS 2415
Corequisite(s): NRS 3321

NRS 3331 - Nursing Care of Children (3)
This course integrates theory, research, and specific nursing interventions for nursing care of children and adolescents, and their families. This course is reserved for students admitted to the ASD track.
Prerequisite(s): NRS 2311, NRS 2411, NRS 2415
Corequisite(s): NRS 3335

NRS 3335 - Nursing Care of Children: Clinical (2)

This course involves the clinical application of theory, research and specific nursing interventions with a focus on children and adolescents. This course is reserved for students admitted to the ASD track.
Prerequisite(s): NRS 2311, NRS 2411, NRS 2415
Corequisite(s): NRS 3331

NRS 3511 - Transition to Baccalaureate Nursing Education (4)
This course focuses on the transition to baccalaureate nursing education for the registered nurse.
Pre/Corequisite(s): NRS 2021

NRS 3531 - Health Promotion in the Community (4)
This course focuses on the development of nursing interventions for health promotion with diverse client populations across the lifespan. This course is reserved for students admitted to the BSN degree completion sequence.
Prerequisite(s): NRS 2021, NRS 3511
Corequisite(s): NRS 3071

NRS 3541 - Nursing Leadership and Health Care Issues (3)
This course presents the principles of nursing leadership and management, health policy, and legal and ethical issues in professional nursing practice. This course is reserved for students admitted to the BSN completion sequence.
Prerequisite(s): NRS 3531, NRS 3071
Corequisite(s): NRS 4551

NRS 3900 - Topics in Nursing (2)
Presents special topics or areas of nursing students may wish to study. Course may be repeated for additional credit when offered as a different topic.
Prerequisite(s): admission to the School of Nursing or permission of instructor.

NRS 4012 - Nursing Leadership (2)
This course focuses on the knowledge and skills needed to be a nursing leader who functions as a contributing member of the inter-professional healthcare team.
Prerequisite(s): NRS 3012, NRS 3022, NRS 3025, NRS 3026

NRS 4015 - Nursing Care of Communities and Populations (5)
This course provides an integrative approach to nursing care of individuals, families, communities, and populations. Concepts include spiritual and cultural influences of care. Social

justice is explored.
Prerequisite(s): NRS 3025, NRS 3026, NRS 3022

NRS 4016 - Nursing Care of the Childrearing Family (5)
This course provides an integrative, family-centered approach to the care of patients across the pediatric lifespan through integration of theory, rationale, and evidence-based nursing practice.
Prerequisite(s): NRS 3012, NRS 3025, NRS 3026

NRS 4026 - Nursing Capstone (5)
This course facilitates the transition of the student to the role of professional nurse. Emphasis is placed on synthesis of knowledge.
Prerequisite(s): NRS 4015, NRS 4016
Pre/Corequisite(s): NRS 4012

NRS 4061 - Community Nursing (3)
This course focuses on the professional nurse's role in the community. This course is reserved for students admitted to the ASD and the Basic-BSN tracks. Prerequisites or corequisites: Basic-BSN: NRS 4111, NRS 4115, NRS 4145
Pre/Corequisite(s): ASD: NRS 4345, NRS 4321, NRS 4325, NRS 4331

NRS 4081 - Perioperative Nursing Didactic Content (1)
This course explores the basic concepts of nursing within the Preoperative, Intraoperative and Postoperative surgical areas. Content areas will be pertinent for students who desire to work in the surgical setting after graduation. Emphasis will be on the circulating role of the registered nurse in the operating room.

NRS 4111 - Nursing Care of Adults with Co-morbidities (3)
This course integrates theory, rationale, and specific nursing interventions for adults and older adults with chronic and complex health conditions. The focus will be on both physiological and psychobiological conditions.
Prerequisite(s): NRS 3265, NRS 3275, NRS 3261, NRS 3271, NRS 3281
Corequisite(s): NRS 4115, NRS 4145

NRS 4115 - Nursing Care of Adults with Co-morbidities: Clinical (2)
This course involves the clinical application of theory, research and specific nursing interventions with a focus on adults and older adults with chronic and complex health conditions.
Prerequisite(s): NRS 3265, NRS 3275, NRS 3261, NRS 3271 and NRS 3281
Corequisite(s): NRS 4111

NRS 4121 - Nursing Synthesis (1)
This course analyzes issues impacting health care delivery and professional nursing practice.
Prerequisite(s): NRS 4061, NRS 4111, NRS 4115, NRS 4145
Corequisite(s): NRS 4125

NRS 4125 - Nursing Synthesis: Clinical (5)
This course is the capstone clinical experience for the Basic-BSN curriculum. *Satisfies the university general education requirement for the capstone experience.*
Prerequisite(s): NRS 4061, NRS 4111, NRS 4115, NRS 4145
Corequisite(s): NRS 4121

NRS 4145 - Nursing Care of Adults with Psychobiological Conditions: Clinical (2)
This course involves the clinical application of theory, research and specific nursing interventions with a focus on adults and older adults with psychobiological conditions.
Prerequisite(s): NRS 3265, NRS 3275, NRS 3261, NRS 3271, NRS 3281
Corequisite(s): NRS 4111

NRS 4321 - Nursing Leadership and Health Care Issues (2)
This course presents the principles of nursing leadership and management, health policy, and legal and ethical issues in professional nursing practice. This course is reserved for students admitted to the ASD track.
Prerequisite(s): NRS 3311, NRS 3315, and NRS 3071
Corequisite(s): NRS 4345, NRS 4061, NRS 4325, and NRS 4331

NRS 4325 - Nursing Synthesis Clinical (5)
This course is the capstone clinical experience for the nursing curriculum. This course is reserved for students admitted to the ASD track.
Prerequisite(s): NRS 3311, NRS 3315, and NRS 3071
Corequisite(s): NRS 4345, NRS 4061, NRS 4321, NRS 4331

NRS 4331 - Nursing Synthesis (1)
This course analyzes issues impacting health care delivery and professional nursing practice. This course is reserved for students admitted to the ASD track.
Prerequisite(s): NRS 3311, NRS 3315, and NRS 3071
Corequisite(s): NRS 4345, NRS 4061, NRS 4321, and NRS 4325

NRS 4345 - Mental Health Nursing (4)
This course focuses on developing competencies for practice in mental health nursing. One credit will be the application of mental health nursing concepts utilizing a variety of clinical

practice sites and experiences. This course is reserved for students admitted to the ASD track.
Prerequisite(s): NRS 3311, NRS 3315, NRS 3071
Corequisite(s): NRS 4061, NRS 4321, NRS 4325, NRS 4331

NRS 4551 - Nursing Care of Populations with Health Disparities (4)
This course focuses on the provision of professional nursing care to patient populations across the lifespan with health disparities. This course is reserved for students admitted to the BSN degree completion sequence. *Satisfies the university general education requirement in U.S. diversity.*
Prerequisite(s): NRS 3531, NRS 3071
Corequisite(s): NRS 3541

NRS 4561 - Community Nursing (4)
This course focuses on the professional nurse's role in the community. This course is reserved for students admitted to the BSN degree completion sequence.
Prerequisite(s): NRS 3541, NRS 4551
Corequisite(s): NRS 4571

NRS 4571 - Nursing Synthesis (4)
This course analyzes issues impacting health care delivery and professional nursing practice. This course is reserved for students admitted to the BSN degree completion sequence.
Prerequisite(s): NRS 3541, NRS 4551
Corequisite(s): NRS 4561

NRS 4585 - Nursing Capstone Experience (4)
This course must be taken in the final semester of degree coursework. This course is reserved for students admitted to the BSN degree completion sequence. *Satisfies the university general education requirement for the capstone experience.*
Prerequisite(s): NRS 2021, NRS 3511, NRS 3531, NRS 3541, NRS 4561, NRS 4551, NRS 3071, NRS 4571

NRS 4685 - Critical Care/Emergency Department (4)
The purpose of this 4 credit hour course is to prepare RN-BSN Degree Completion nurses to work in critical care and emergency areas.
Prerequisite(s): NRS 3071

NRS 4687 - Critical Care/Emergency Department (1)
The purpose of this 1 credit hour course is to prepare student nurses to work in a critical care and emergency department in hospitals.

Prerequisite(s): NRS 4061 and NRS 3071 or NRS 4061 and NRS 3071 and NRS 4345 and NRS 4325

NRS 4900 - Topics in Nursing (1 TO 12)
Provides comprehensive theoretical nursing content related to a specialty area, e.g., critical care, maternity, etc. Clinical experience in a healthcare facility may be required.
Prerequisite(s): admission to the School of Nursing.

NRS 4996 - Independent Study (1 TO 12)
This course engages students in individual research, directed readings, or group study under the supervision of a faculty member.
Prerequisite(s): admission to the School of Nursing