BIOCHEMISTRY PROGRAM

Biochemistry Committee: *Denis M. Callewaert (Chemistry), Bandana Chatterjee (Chemistry), John D. Coulishaw (Biological Sciences), Kathleen H. Moore (Chemistry), Virinder K. Moudgil (Biological Sciences), Arun K. Roy (Biological Sciences), Michael D. Sevilla (Chemistry), Hitoshi Shichi (Eye Research Institute)*

This interdepartmental program offers a Bachelor of Science degree with a major in biochemistry. The biochemistry program is based on faculty resources and research facilities in the departments of Biological Sciences and Chemistry. The curriculum is designed to prepare students for professional schools in health sciences, graduate school in biochemistry and biochemical research.

The specialized research facilities for cellular and analytical biochemistry at Oakland University include tissue culture facilities, an ultracentrifugation laboratory, isotope laboratories with beta and gamma counters, gas chromatographs, equipment for high pressure liquid chromatography, equipment for NMR, EPR, laser Raman and atomic absorption spectroscopy, and various other computerized biochemical equipment.

Undergraduate students in the biochemistry program have access to faculty research laboratories and are encouraged to participate in various ongoing research programs such as studies in gene expression, hormone action, immunochemistry, biochemistry of viruses and nucleic acids, and radiation damage to macromolecules. The minimum requirement for a B.S. in biochemistry is 124 credits, which include 30 credits in chemistry, 16 credits in biological sciences and 14 credits in biochemistry.

Admission requirements

Students may apply for admission to the biochemistry program after completing 16 credits of the core program with a grade point average (GPA) of 2.50 or better. Courses that carry no numerical grade and letter grades are excluded from the calculation of the GPA.

Requirements for the Bachelor of Science degree in biochemistry

Students wishing to select the biochemistry major should prepare a detailed plan of study in consultation with a member of the Biochemistry Committee. To earn the Bachelor of Science degree with a major in biochemistry, students must complete:

1. A core program of 56 credits, including BIO 190, CHM 144, CHM 145, CHM 149, CHM 225, CHM 203, CHM 204, CHM 209 (or CHM 234, CHM 235 and CHM 237), CHM 342, CHM 343, BCM 453, BCM 454, PHY 151, PHY 152, MTH 154 or MTH 155 (STA 226 is a recommended elective)
2. An additional 12 credits in biology from the following courses: BIO 200, BIO 319, BIO 320, BIO 321, BIO 322, BIO 323, BIO 324, BIO 341, BIO 342, BIO 345, BIO 393 or BIO 394
3. At least 8 credits of advanced study in biochemistry from the following courses: BIO 407, BIO 408, BIO 439, BIO 440, CHM 457, CHM 458, CHM 553, CHM 554 or BCM 490
4. Admission to major standing and approval by the Biochemistry Committee of a detailed program of study at least three semesters before graduation.
5. Courses used to fulfill the requirements of a major in biology or chemistry may not be used to simultaneously fulfill the requirements of a major in biochemistry.

Course Offerings

BCM 453-454 Biochemistry (3 each)
Identical with CHM 453-454.

BCM 490 Biochemistry Research (1, 2, 3, 4)
Laboratory experience in biochemical research requiring at least four hours of work per week per credit. May be repeated for credit. Graded S/U.
Prerequisite: Permission of instructor.

ENVIRONMENTAL HEALTH PROGRAM

Director: *Paul: Tomboulian (Chemistry)*

Designed to integrate applied scientific specialties within the broad field of environmental health, the environmental health program curricula described below prepare students for a variety of professional opportunities in government and the private sector and for graduate study in such fields as toxicology, industrial hygiene and environmental planning.

Graduates of the program should be able to identify and evaluate a broad range of environmental problems. In addition, they should be able to offer solutions, anticipate hazards and prevent future problems. Studies include such areas as health and safety in the work place, toxic substances, air resources, water resources, land resources and planning.

Requirements for the B.S. degree

To earn a Bachelor of Science degree with a major in environmental health, students must complete:

1. An introductory prerequisite core of 38 credits, to be completed with a 2.00 average before major standing is awarded, including BIO 190, BIO 200, CHM 144, CHM 145, CHM 149, CHM 225, PHY 151, PHY 152 (or, for students not considering graduate work, PHY 101 and PHY 102) and 8 credits in mathematics above MTH 121 or MTH 141, usually including STA 225. MTH 154 is strongly recommended (MTH 155 is recommended for students considering graduate education).
2. A program of 50 credits in advanced courses, usually including ENV 308 plus courses required by one of the three options. At least 36 credits must be in courses at the 300 level or above, and 30 credits must be in approved courses numbered 350 and above. At least 16 of the credits taken at the 300 level or above must be taken at Oakland University.
3. Completion of one of the specializations described below.

Specialization in occupational health and safety

Based upon an extensive curriculum planning study, this option combines environmental and occupational health perspectives in scientific and technical courses designed to provide preprofessional training for careers relating human health and safety factors to working conditions. Students learn to recognize, evaluate and control actual and potential environmental hazards, especially undesirable occupational health and safety conditions and practices. The option emphasizes environmental and occupational toxicology.

Required course work includes BIO 207 or BIO 321, CHM 203-204, ENV 355, ENV 358, ENV 386, ENV 388, ENV 474 and ENV 481. Recommended electives include ENV 350, ENV 372, ENV 373, ENV 387, ENV 388, ENV 452, ENV 461, ENV 470, ENV 484, ENV 486, BIO 407 or CHM 453, BIO 301, PS 353 and HST 302.

Specialization in environmental and resource management

This option emphasizes the wise use of resources, especially as they affect human health and well-being. Opportunities for study include air pollution, water pollution, demography, land resource management, control applications and planning functions. Program electives offer training for a variety of field and laboratory opportunities in industry and government, including planning, natural resource management, environmental protection and public health.

Required course work includes the core, plus the following: ENV 355, BIO 301, PHY 107 and PHY 158.

Recommended electives include CHM 203-204, BIO 207 or BIO 321, BIO 303, BIO 311, BIO 312, BIO 307 or BIO 319, BIO 327, BIO 333, BIO 373, BIO 375, BIO 377, BIO 407, BIO 481, ENV 312, ENV 372, ENV 373, ENV 386, ENV 461, ENV 474, ENV 481, ENV 484, PS 302, PS 305, PS 350, PS 353, EGR 407 and HST 228.

Specialization in toxic substance control

This option is designed to provide training for professional opportunities in toxic substance management. The major focus is on toxicological principles and their applications to the production, distribution and release of toxic substances, especially as they may cause environmental problems. Risk assessment, problem solving and legislative compliance are emphasized.

Required course work includes the core plus BIO 301, CHM 203-204, ENV 461, ENV 481, ENV 484 and ENV 486.

Recommended electives include CHM 453 or BIO 407, BIO 341, BIO 375, BIO 377, PHY 107, PS 353, ENV 372, ENV 373, ENV 386, ENV 388 and ENV 474.

Course Offerings

ENV 308 Introduction to Environmental Studies (4)
Survey of a broad range of environmental issues from a scientific viewpoint. Basic ecological and thermodynamic principles with applications to air, water and land pollution; human demography and food supplies; alternative futures. *Satisfies the university general education requirement in natural science and technology.*
Prerequisite: Sophomore standing.

ENV 312 Energy and the Environment (4)
Basic facts of energy: sources, forms, the roles it plays, and its ultimate sinks. Includes study of laws limiting energy utilization, energy flow patterns, effects of energy use on the environment, and analyses of current energy-related problems.
Prerequisite: Sophomore standing; mathematics proficiency at the MTH 111 level.

ENV 322 Subsistence and Technology in Nonindustrial Society (4)
Identical with AN 322.

ENV 333 Food and Nutrition (4)
Introduction to the science of nutrition, with applications to the human diet. Includes compositional analysis of foods, nutritional requirements and fads, and the relationships of agriculture and politics to nutrition.
Prerequisite: Sophomore standing.

ENV 343 Tropical Habitats (2)
Biological analysis of the interactions with tropical environments. Includes history, geology, climatology, agriculture, public health and epidemiology involved with human living in tropical settings.
Prerequisite: Sophomore standing.

ENV 346 Life in the Oceans (4)
Physiographic history, habits, community groups, interrelationships among organisms, the oceans as a food source, human impacts on oceans.
Prerequisite: Sophomore standing.

ENV 350 Selected Topics (1, 2, 3 or 4)
Technical studies in special areas; topics vary with semester. May be repeated for credit.
Prerequisite: Junior standing and permission of instructor.

ENV 355 Environmental Health Practice (3)
Survey of environmental health activities from public health perspective: vector control and prevention, sanitation practice, solid waste management, air pollution control, environmentally related diseases and their prevention.
Prerequisite: Junior standing in environmental health.

ENV 358 Occupational Safety (3)
Systematic study of occupational safety concerns, including accident prevention, loss control, safety management, behavioral factors, hazard reduction, risk management, safety engineering, safety education, and safety laws and regulations.
Prerequisite: Junior standing in environmental health.

ENV 372 Air Chemistry (3)
Technical evaluation of the nature and composition of the earth's atmosphere, both in its natural state and as it has been affected by man. Some discussion of air pollution control will be included.
Prerequisite: CHM 145.

ENV 373 Water Resources (3)
Analysis of natural water systems, introductory hydrology, the chemistry of eutrophication, and wastewater systems. Emphasis is on applications, including water pollution abatement and management strategies.
Prerequisite: CHM 145 and junior standing.

ENV 386 Principles of Occupational Health (3)
Recognition, evaluation and control of environmental factors affecting human health, especially in the work place (industrial hygiene); anticipation and prevention of future hazards.
Prerequisite: Junior standing in environmental health; BIO 190, CHM 203; physics is desirable.

ENV 387 Principles of Occupational Health II (3)
An intensive treatment of selected subjects of current interest in occupational health.
Prerequisite: ENV 386.

ENV 388 General Control Methods (3)
Theory and practice of control of exposure to occupational hazards, government standards, philosophies, ventilation, protective equipment and exposure control will be emphasized.
Prerequisite: ENV 386 or 387.

ENV 390 Directed Studies (1, 2, 3, 4 or 6)
Studies in special areas, often individually arranged. May be repeated for credit. Preparation of study plan and instructor's approval are required before registration. Graded S/U.

ENV 410 Human Adaptation (4)
Identical with AN 410.

ENV 452 Industrial Environmental Control (3)
Problems of air and water pollution, solid waste management, hazardous material handling, and emergencies examined from an industrial viewpoint. Chemical engineering solutions to environmental problems, practical aspects and compliance with regulations.
Prerequisite: Junior standing in environmental health, CHM 145, MTH 154.

ENV 461 Environmental Law and Policies (3)
Legislative and legal perspectives on environmental and occupational health issues. Special emphasis on current laws and regulations, as well as their impact on the groups regulated.
Prerequisite: Junior standing.

ENV 470 Occupational Health Internship (2)
Supervised practical experiences in a variety of occupational health settings.
Prerequisite: Senior standing in environmental health and permission of instructor.

ENV 474 Measurements and Sampling Methods (1, 2 or 3)
Analysis of environmental and occupational exposures and hazards using instrumental methods in the laboratory and field locations.
Prerequisite: CHM 149 and CHM 225; ENV 386 or 388.

ENV 481 Principles of Toxicology (3)
General principles of toxicology: exposure, toxokinetic, and toxodynamic phases; dose effect relationships; toxicological testing methods; factors influencing toxicity. Emphasis is on systemic mammalian toxicology.
Prerequisite: BIO 190, 200; CHM 203 or 234; BIO 207 or 321 desirable; biochemistry desirable.

ENV 484 Environmental Toxicology (3)
Applications of toxicology to broad environmental issues of air, water and land resource pollution; study of sources dispersion, and fate of toxic substances; effects on biological systems.
Prerequisite: BIO 190, BIO 200, CHM 204 or 234; ENV 308, and ENV 386 or 481; biochemistry desirable.

ENV 486 Toxic Substance Control (3)
Detailed discussion of toxic substance flows in society; identification, production, use, distribution and disposal. Emphasis is on risk assessment, risk-benefit analyses, regulatory practices and programs. Current management philosophies and disposal methods are analyzed.
Prerequisite: Junior standing in environmental health; CHM 203; ENV 481 or 484 desirable.

SECONDARY TEACHING SOCIAL STUDIES PROGRAM

The secondary teaching social studies program offers a baccalaureate program with a major in social studies or a separate social studies minor. Students seeking the Bachelor of Arts degree with a major in social studies will take a minor in sociology, psychology, history or political science to achieve secondary teacher certification.

The Michigan secondary provisional certificate is valid for teaching all subjects in grades 7 and 8. In subject matter areas in which the student has completed a major or minor, it is also valid for grades 9 through 12. This program may require more than the minimum number of credits to complete, depending on the student's rhetoric and language placement.

B.A. degree with a teaching major in social studies

To complete the Bachelor of Arts degree with a teaching major in social studies, students must fulfill all requirements set by the College of Arts and Sciences for B.A. candidates.

The social studies program requires a core of social science courses with concentrated study in three social science content areas. The student must:

1. Complete a total of 40 credits in social studies and the social sciences, including:
   a. SS 100 and 200 (prerequisite for ED 455 internship)
   b. 16 credits in political science, evenly distributed between American politics and non-American comparative politics
   c. 16 credits in history, evenly distributed between American history and world history
2. Complete a minor of at least 20 credits in one of the following social sciences: sociology, psychology, history or political science. If a student minors in either political science or history, 16 credits in another social science or from an interdisciplinary social science group must be substituted in the major.
3. Complete a professional component of 40 credits:
   a. ED 110, 370, 427 and 428 must be taken sequentially in three semesters and are each prerequisites to ED 454 and 455.
   b. ED 338, 344 and 345 may be taken any time in the student's program before ED 455.

Students may enroll in ED 455 (internship) only if their grade point average (GPA) in professional courses (ED 110, 370, 427 and 428) is 2.50 or above, with no grades below 2.0; and if their GPA in courses in their majors is 2.50 or above, with no grades below 2.0.

Failure to complete certification requirements in the secondary social studies teaching major may result in the need for additional course work in order to complete an alternative College of Arts and Sciences major.

Advising for the program is available from Nancy Collins, academic adviser, School of Human and Educational Services.

Secondary teaching minor in social studies

A teaching minor in social studies requires completion of SS 100 and 20 additional credits in the social sciences. At least three courses must be taken at the 200 level or above. Students should concentrate in two of the social sciences, earning at least 8 credits in each.

Students intending to minor in social studies must see their secondary social studies academic adviser upon entry into a teacher certification program to agree upon the social sciences concentration and distribution. This minor may not be taken by students majoring in secondary social studies; it is open to any other student with a secondary teaching major.

Students intending to minor in social studies must see their secondary social studies academic adviser upon entry into a teacher certification program to agree upon the social sciences concentration and distribution. This minor may not be taken by students majoring in secondary social studies; it is open to any other student with a secondary teaching major.

Course Offerings

SS 100 Introduction to Social Studies (4)
This introduction to an interdisciplinary social science program provides an overview of the philosophical and historical development of individual social science disciplines (psychology, sociology, anthropology, political science, history, economics and geography). Required of all social studies majors and minors.

SS 200 Inquiry Skills for the Social Scientist (4)
Continues the interdisciplinary focus begun in SS 100. Current issues form its content. Students are expected to apply interdisciplinary investigative models to these issues to solve problems. Required of all social studies majors before student teaching.
Prerequisite: SS 100.

OTHER ACADEMIC OPTIONS

Concentration in American Studies

Coordinator: *Jane D. Eberwein (English)*

Committee: *Sheldon L. Appleton (Political Science), Carlo Coppola (International Studies, Modern Languages), James W. Dow (Anthropology), Thomas Fitzsimmons (English), Robert J. Goldstein (Political Science), Roy A. Kotynek (History), Bruce J. Mann (English), David W. Mascitelli (English), Janice Schimmelman (Art History), Richard B. Stamps (Anthropology), W. Patrick Strauss (History), Ronald A. Sudol (Rhetoric)*

The American studies concentration provides both a broad understanding of the American experience and an introduction to the practice of focused interdisciplinary study. The concentration is taken in addition to a departmental major. By electing departmental courses with an American focus in two or three areas outside the major and framing the concentration with two interdisciplinary American studies courses, students may expect to gain a coherent sense of the national experience and appreciate the various contributions of different academic disciplines.

Although not a vocationally directed program, the American studies concentration should be of particular interest to students preparing for careers in law, government and journalism, and those planning graduate work in American studies or any of its contributing disciplines.

Concentration requirements include one course from the AMS 201, AMS 202, AMS 203 and AMS 204 grouping, AMS 400 and four electives representing at least two fields of study outside the student's major. Recommended electives appear on the list below; other courses emphasizing American materials may also be counted toward the concentration upon approval of a committee adviser.

Recommended departmental electives

Art and Art History: AH 350, 355
English: ENG 224, 302, 317, 320, 322, 324, 332, 341, 342
History: HST 114, 115, 218, 221, 292, 302, 306, 307, 310, 312, 313, 314, 315, 316, 317, 318, 319, 321, 323
Linguistics: LIN 303
Music: MUS 347
Philosophy: PHL 260
Political Science: PS 100, 115, 203, 301, 302, 305, 307, 323, 324, 342, 343, 371, 402, 403
Sociology/Anthropology: SOC 100, 205, 301, 315, 331, 357, 455; AN 380, 381

Course Offerings

AMS 201-204 Approaches to American Culture (4)
Study of central themes in American cultural experience (such as equality, success, individualism, the frontier) from an interdisciplinary perspective. 201 — emphasis on the fine arts. 202 — emphasis on history. 203 — emphasis on literature. 204 — emphasis on social sciences. A student may receive credit for only one course in this sequence.

AMS 400 American Studies Colloquium (4)
Examination of one topic in American studies. Should be taken in the junior or senior year. Offered every fall. Prerequisite: AMS 201, 202, 203 or 204.

Concentration in Applied Statistics

Coordinator: *Robert B. Stewart (Psychology)*

Committee: *Keith A. Berven (Biological Sciences), William E. Bezdek (Sociology and Anthropology), Mary P. Coffey (Mathematical Sciences), Gerard R. Joswiak (Computer Services), Nancy S. Kunsman (Political Science), Scott A. Monroe (Economics), Robert M. Schwartz (Education), John R. Stevenson (Health Sciences), Mohamed A. Zohdy (Engineering)*

The University Committee on Applied Statistics sponsors this interdisciplinary concentration in applied statistics, which is available to all university undergraduates. This concentration focuses on the application and interpretation of statistical procedures in the pursuit of empirically based knowledge. In order to be certified by the committee as having fulfilled the concentration requirements, students must complete at least 16 credits in statistics, including:

1. One course at the introductory level (QMM 250, PSY 357, SOC 203, STA 226 or SYS 317)
2. STA 322
3. STA 323 or 324
4. One 400-level course in the student's major. This course must meet the approval of the University Committee on Applied Statistics.

Students who wish to take this concentration must develop a program in consultation with a committee member.

Concentration in Archaeology

Coordinator: *Richard B. Stamps (Anthropology)*

Committee: *Carl F. Barnes, Jr. (Art History), Gottfried Brieger (Chemistry), James W. Dow (Anthropology)*

The concentration in archaeology prepares students for graduate study in archaeology. It is also helpful for students interested in an interdisciplinary approach to human cultural development viewed from historical, aesthetic and scientific perspectives. Twenty-eight credits are required for this program:

1. AH 100, AN 101 and 222
2. One of the following: AH 312, AH 314, AN 282, AN 370, AN 371 or AN 380
3. 8 credits in methods and field term (AN 383)

In addition to the required courses, a number of other courses are recommended for those who wish to expand their background. These include: AH 322, AH 326, HST 261, HST 306, HST 367 and PHY 107. Students are reminded that professional conservation work requires knowledge in botany and chemistry.

Minor in Computer Science

Coordinator: *Richard E. Haskell (engineering)*

The minor in computer science is offered by the School of Engineering and Computer Science and is available to students within the College of Arts and Sciences. Many combinations are feasible.

With a major in mathematics, physics, chemistry, biology or economics, a student may wish to emphasize numerical and scientific computing aspects of computer science. With a major in English, modern languages, history, philosophy, psychology, sociology or anthropology, a student may wish to take courses that emphasize non-numerical and symbolic data processing, language translation and list processing. With a major in economics, a student may wish to take courses oriented toward application of computers in management data processing. For specific requirements, see page 229 of this catalog.

Concentration in Energy Studies

Coordinator: *Gottfried Brieger (Chemistry)*

The concentration in energy studies provides students with an interdisciplinary approach to energy issues, examined from the perspective of anthropology, biology, chemistry, economics, engineering, physics and political science. It serves as a foundation for additional specialized study in any of these fields. This concentration requires 28 credits, distributed as follows:

1. Core — all of the following: AN 322, ENV 312, PHY 115 and PS 250
2. Advanced option — one of the following: AN 410, ME 454, EGY 350
3. Practicum — all of the following: EGR 106, EGR 108 and EGY 390 (4 or 8 credits)

Course Offerings

EGY 350 Energy Efficient Food Production (4)
Man's opportunities for production of food nutrients through efficient field agriculture, horticulture, and aquaculture, and the energy relationships involved.
Prerequisite: One year of college-level science or permission of the instructor.

EGY 390 Energy Projects (4 or 8)
Laboratory or field work under the direction of a faculty supervisor approved by the concentration coordinator on a current energy-related issue resulting in a comprehensive project and report.
Prerequisite: Concentration core courses EGR 106 and EGR 108 are recommended prior to enrollment.

Concentration in Environmental Studies

Coordinator: *Paul Tomboulian (Chemistry)*

The concentration in environmental studies introduces students to modes of thought and action relative to environmental issues. Students learn to identify and evaluate alternative solutions to environmental problems. Short- and long-range implications of human activities are analyzed, especially as they affect resources and public policy.

Four broad areas of inquiry are included in these studies: systematic analyses of environmental quality issues; effects of human settlements on ecosystems; implications of human life support activities; and use, reuse and depletion of physical and biological resources.

Concentrations are available in conjunction with cooperating departments. Requirements for the concentration are 28 credits in environmental studies and related courses, to be planned and selected with the program coordinator. Courses in environmental studies are listed under the Environmental Health Program (see page 173).

Related courses in many departments are often suitable for an environmental studies concentration. These include, but are not limited to: AN 102, BIO 301, BIO 303, BIO 311, BIO 327, BIO 373, BIO 375, BIO 377, ECN 309, ECN 310, EGR 407, HST 228, PHL 318, PHY 107, PHY 115, PS 250, PS 305, PS 350 and PS 353. Consult the program coordinator for details.

Concentration in Film Aesthetics and History

Coordinator: *Dolores M. Burdick (French)*

Committee: *Bonnie Abiko (Art and Art History), Peter J. Bertocci (Anthropology), Alfred J. DuBruck (French), Robert T. Eberwein (English), Donald C. Hildum (Communications), Brian F. Murphy (English)*

The interdisciplinary concentration in film aesthetics and history, sponsored by the departments of English, Modern Languages and Literatures, Art and Art History, Center for International Program, and Rhetoric, Communications and Journalism, offers multiple perspectives for examining theoretical and critical issues of film as art and communication. The introductory courses explore the operation, function and construction of film. The history courses ex-

amine narrative and technical developments with emphasis on major directors, genres and trends. The theoretical courses are concerned with the uniqueness of film, its relation to other forms of verbal and plastic arts, and special approaches needed for analysis and enjoyment.

The range of viewing experiences and the variety of approaches to the medium provide an excellent preparation for students seeking employment in advertising, publishing, journalism, visual media or teaching, as well as those who wish to pursue film studies on the graduate level.

Twenty-eight credits are required, including CIN 150, ENG 250, ENG 392; two courses chosen from among CIN 300, CIN 301 and CIN 302; and two courses chosen from AH 367, AN 307, CIN 450, ENG 309, LIT 251 and SCN 303. In special circumstances, CIN 499 may be substituted for one of the above courses with permission of the concentration coordinator.

Course Offerings

CIN 150 Introduction to Film (4)
Introduction to the art of film by examination of the filmmaking process, study of narrative and non-narrative film, and exploration of film's relation to society. *Satisfies the university general education requirement in arts.*

CIN 300 History of Film: The Silent Era (4)
Survey of directors and films important in shaping film history: Griffith, Eisenstein, Chaplin, Maurnau, Pabst, Lang and others.

CIN 301 History of Film: The Sound Era to 1958 (4)
Examination of significant directors, genres and movements: Welles, Hitchcock, Renoir, DeSica and others; the western, gangster film, musical; neorealism, film noir.

CIN 302 History of Film: The New Wave and Beyond (4)
Study of film since 1959: New Wave directors such as Truffaut, Godard, Resnais; major artists such as Fellini, Bergman, Kubrick; experimental films and new developments.

CIN 450 Topics in Film (4)
Examination of specialized subjects in film such as: The War Film, Alfred Hitchcock's Films, The New Wave, The Japanese Cinema. Topics to be selected by instructor.

CIN 499 Independent Study (4)
Study on an independent basis for students with demonstrated interest in film. A proposed course of study must be submitted to the prospective instructor in the semester before the independent study is to be taken. Prerequisite: One course in film.

Concentration in Folklore and Popular Culture

Coordinator: *Mark E. Workman (English)*

Committee: *Jane M. Bingham (Education), Marc E. Briod (Education), Judith K. Brown (Anthropology), Roy Kotynek (History), Lucinda Hart-Gonzalez (Linguistics), Amitendranath Tagore (Chinese)*

Folklore is traditional, artistic behavior; it is engaged in by even the most intellectually and technologically sophisticated among us, and it encompasses all modes of expression. Popular culture borrows from folklore its formulas of production as well as much of its content. The concentration in folklore and popular culture provides an introduction to the materials and methods of inquiry into these subjects, and encourages students to pursue further the extensive social and cultural ramifications of folklore and popular culture into related areas of study.

The program is of potential relevance to students in all areas of the humanities, social sciences and education. It will be of benefit to them both in their studies at Oakland University and as preparation for careers in the media, human services, teaching or graduate work in any of the fields related to the concentration.

This concentration requires 28 credits, including ENG 214 and 302. A minimum of 8 credits must be taken at the 300-400 level, and no more than 8 credits from the student's major will

count toward the concentration. A current list of approved electives, which must be selected in consultation with the concentration coordinator, follows: AN 251, AN 271, AN 310, AN 333, IS 386, AH 360, SCN 371, THA 346, ED 332, ENG 120, ENG 211, ENG 302, ENG 304, ENG 312, ENG 313, ENG 314, CIN 150, HST 222, HST 292, HST 346, ALS 375, MUS 347 and REL 295.

Concentration in Gerontology

Coordinator: *Harold Zepelin (Psychology)*

Committee: *David P. Meyer (Education), William F. Moorhouse (Education), Frank Schieber (Psychology), Elinor B. Waters (Continuum Center)*

The multidisciplinary concentration in gerontology, which is co-sponsored by the School of Human and Educational Services, provides students an opportunity to gain an understanding of aging as a process in personal, cultural and social contexts. It adds another dimension to career preparation for students who plan to obtain graduate degrees in helping professions such as nursing, clinical psychology and social work. It also offers essential background and introductory experience to students holding bachelors degrees who wish to seek employment in agencies that provide services for the elderly.

The concentration requires 24 credits, 12 in required core courses and 12 in elective courses. The advanced core course, a multidisciplinary seminar on aging (GRY 400), will bring students into contact with diverse disciplines that have an interest in aging. Students in arts and sciences must choose one elective (4 credits) from HRD courses.

Requirements for the concentration in gerontology consist of the following:

1. Core — two of the following: BIO 250, PSY 331 and SOC 465
2. Required advanced course: GRY 400
3. Electives: HRD 369 or HRD 490, HRD 431, HRD 467, HRD 469, PSY 371, PSY 372, SOC 314/514 or SOC 315/515, and GRY 480

Course Offerings

GRY 400 Multidisciplinary Seminar on Aging (4)
Presentations of research and reviews of the literature, bringing together contributions from biology, the health care professions, the humanities, political science, psychology and sociology.
Prerequisites: Completion of required introductory courses.

GRY 480 Research in Gerontology (4)
Individually designed experience in research on aging, beginning with reviews of the literature and culminating in data collection or formulation of a research proposal.
Prerequisite: Concentration's introductory requirements and an introductory research course.

Concentration in Michigan Studies

Coordinator: *Richard B. Stamps (Anthropology)*

Committee: *John B. Cameron (Art History), Paul Doherty (Physics), W. Patrick Strauss (History)*

The concentration in Michigan studies is an integrated program of courses that provides both a broad introduction to and a focused interdisciplinary study of Michigan. Each student is required to take MC 100 "Life in Michigan", which serves to integrate the various disciplinary offerings.

The concentration requires completion of 26 credits, including MC 100, to be selected from the following course offerings. No more than 8 credits from the student's major may be counted toward the concentration.

Course Offerings

MC 100 Life in Michigan (2)
An introduction to Michigan history and politics, fine art and archaeology, geology and environment, flora and fauna, climatology, and industry and economic development.

Students will select the remaining 24 credits from the following courses (4 credits each, except for ENV 373, 3 credits).

AH 355 Michigan Architecture
AH 360 History of Automobile Design
AH 399 Field Experience in Art History
AN 383 Methods in Anthropological Archaeology
AN 399 Field Experience in Anthropology
BIO 303 Field Biology
ENV 373 Water Resources
HST 218 History of Michigan
HST 302 American Labor History
HST 399 Field Experience in History
PS 305 Politics of the Local Community
PS 307 State Politics
PS 458 Public Affairs Internship
SOC 343 Communities

Concentration in Preprofessional Studies in Medicine, Dentistry and Optometry

Coordinator: *Egbert W. Henry (Biological Sciences)*

Committee: *Gottfried Brieger (Chemistry), Denis M. Callewaert (Chemistry), John R. Reddan (Biological Sciences), Robert L. Stern (Chemistry), Nalin J. Unakar (Biological Sciences), Robert H. Edgerton (Engineering), Barry S. Winkler (Eye Research Institute)*

The concentration in preprofessional studies in medicine, dentistry and optometry is intended for students who wish to pursue careers in medical, osteopathic or dental professions. Students are expected to complete a concentration consisting of the following:

1. 20 credits of biology, including laboratories
2. 20 credits of chemistry, including laboratories and two semesters of organic chemistry
3. 8 credits of mathematics
4. 10 credits of physics, including laboratories

In chemistry, mathematics and physics courses, students should opt for sequences that are more rigorous in academic content. The concentration provides the minimum requirements for admission to various medical, osteopathic and dental schools in Michigan and elsewhere. The committee strongly recommends the following additional courses for better preparation for the Medical College Aptitude Test (MCAT) and medical school curriculum:

1. Science: genetics (BIO 341, 342), developmental biology (BIO 323, 324), biochemistry (BIO 325 and 326 or CHM 453, 454, 457 and 458) and physiology (BIO 321 or BIO 207 and 208).
2. Humanities: vocabulary and etymology (ALS 102) and/or RHT 103, 105 and 110. RHT 105 and 110 are suggested for improving reading comprehension skills in preparation for the MCAT.

Students intending to pursue a career in the optometric profession are advised to take the following courses:

1. 20 credits of biology, including laboratories
2. 20 credits of chemistry, including laboratories and two semesters of organic chemistry
3. 12 credits of mathematics, including calculus (MTH 154 and MTH 155)
4. 10 credits of physics, including laboratories
5. 4 credits of introductory psychology, 8 credits of English and 8 credits of social science

This concentration does not constitute a major. Students must elect a major from those offered by the university. Interested students should consult the advisory committee for counseling and assistance in planning their academic programs.

Concentration in Religious Studies

Coordinator: *Leonardas V. Gerulaitis (History)*

The religious studies concentration offers a series of courses on religion, both Western and Eastern, traditional and contemporary. These courses do not seek to confirm or attack any particular religious point of view; they are taught in the same scholarly and objective spirit as other university courses and aim at understanding a pervasive human phenomenon. They are grouped into two types: historical studies and systematic studies.

The program currently offers a concentration in religious studies that consists of at least 20 credits in religion, which may be taken jointly with a modified major (24 credits) in philosophy or with a full major in any other department of the College of Arts and Sciences.

Students wishing to make religion the focus of an independent major will receive the support of the Committee of Religious Studies. Interested students should see the concentration coordinator for further information.

In addition to the religion courses, several collateral courses are suggested: ENG 312, HST 325 and PHL 205. Courses with REL 200 numbers require only sophomore standing; courses with REL 300 numbers require one previous course in religious studies at Oakland University, unless identical with departmental courses having different prerequisites.

Course Offerings

HISTORICAL STUDIES

REL 200 Topics in the Historical Study of Religion (4)
The topic varies. Samples include: the New Testament, medieval mysticism, early Buddhism, the Protestant Reformation, Christ and Caesar, eighteenth and nineteenth century attacks on religion. May be repeated for credit.

REL 202 The Jewish Tradition (4)
Selected ideas and institutions in the development of Judaism from its pre-exilic roots to the present. Offered in cooperation with the Jewish Chautauqua Society.

REL 203 The Christian Tradition (4)
Study of the most important Christian ideas and institutions from Jesus to the present.

REL 211 The Bible as Literature (4)
Identical with ENG 211.

REL 250 Philosophies and Religions of Asia (4)
Identical with PHL 250.

REL 295 Contemporary Religious Movements (4)
Begins with a review of institutional religion in America, then surveys underground church movements, Zen, Yoga, TM, and others. Field work possible.

REL 304 The Islamic Tradition (4)
Selected ideas and institutions in the history of Islam.

REL 307 American Religious History (4)
Identical with HST 307.

SYSTEMATIC STUDIES

REL 220 Topics in the Systematic Study of Religion (4)
The topic varies. Samples include: mythology, psychoanalysis and religion, religion and education, types of religious communities, shamanism, the hero. May be repeated for credit.

REL 225 Philosophy of Religion (4)
Identical with PHL 225.

REL 227 Psychology of Religion (4)
Basic data of religious experience in relation to motivation, cognitive structure, and personality; problems of religious symbolism, verbal and nonverbal; dynamics of religious movements; growth, propagation, and preservation of orthodoxy; varieties of reform.

REL 229 Religion and Literature
Study of a few masterpieces of world religious literature, such as Greek tragedy, Hindu epic, Dante and Milton, with an attempt to generalize about the use of religious themes in literature and about literature as an expression of religious belief.

REL 271 Magic, Witchcraft and Religion (4)
Identical with AN 271.

REL 291 Religion and Contemporary Moral Problems (4)
Investigation of the theological and ethical reasons for the emergence of a new attitude toward moral questions. Protestant, Catholic, Jewish and secular viewpoints on some of these: love, sex, civil disobedience, criminal punishment, violence, war, suicide and death.

REL 305 Sociology of Religion (4)
Identical with SOC 305.

REL 390 Directed Readings in the Study of Religion (4)
Individual study of a topic not covered by regular courses, with guidance of a faculty tutor. May be repeated for credit.
Prerequisite: Permission of concentration coordinator.

Concentration in Social Justice and Corrections

Coordinator: *Students should consult the chairperson, Department of Sociology and Anthropology, for advising referral*

The concentration in social justice and corrections requires at least 28 credits and is to be taken in conjunction with a full major in any department of the college. It provides career-oriented education for students interested in the social forces producing delinquency and crime, in the evaluation of social planning for crime prevention and control, and in the operation of police organizations and correctional institutions.

A student must be formally admitted to the program and meet the following requirements:

1. 12 credits chosen from SOC 320, SOC 322, SOC 327, SOC 425, PS 241 and PS 343
2. 12 credits from HI 361, HI 461, ORG 330, ORG 331, PHL 103, PHL 221, PS 241, PS 342, PS 343, PSY 220 and PSY 322
3. 4 or 8 credits of SOC 430

Concentration in Social Services

Coordinator: *Jacqueline R. Scherer (Sociology)*

The concentration in social services requires 28 credits and is available to students throughout the university, regardless of major. It is primarily designed for students who intend to pursue graduate studies in social services or who are interested in the analysis of social programs and social welfare policies. The social and psychological dimensions of service delivery are explored as they relate to professional development and the integration of theoretical and applied approaches to problem solving.

The following requirements apply to the concentration in social services:

1. SOC 314 and 315
2. Two of the following: PSY 220, 271, 311 or 331
3. Field experience: PSY 399, SOC 399 or equivalent course

4. Statistics: SOC 203 or equivalent statistics course
5. One elective from the following: HI 361, SOC 328, SOC 331, PSY 323, PSY 336 or HRD 331

Students are requested to enroll formally in the program by completing an application at the Department of Sociology and Anthropology office.

Concentration in Urban Studies

Coordinator: *Harry Gold (Sociology)*

Committee: *Johnetta Brazzell (Placement and Career Services), De Witt S. Dykes (History), Oded Izraeli (Economics)*

The urban studies concentration is designed to provide a comprehensive interdisciplinary understanding of modern urban civilization and to develop an appreciation of some of the problems and policy issues confronting contemporary American urban communities. It is also designed to introduce some of the technical skills that are a prerequisite to the successful pursuit of career opportunities in a variety of urban-oriented public and private service or administrative organizations.

The concentration provides a carefully selected group of required core courses drawn from several departments, allows a relatively broad choice of electives and provides an interdisciplinary seminar designed to help integrate the knowledge and skills acquired in the program.

Students wishing to pursue the concentration in urban studies must submit an advising plan to the concentration adviser and make application to the concentration coordinator to be admitted to the program. One course in statistics and/or methodology offered by a social science department or a statistics course offered by the Department of Mathematical Sciences is a prerequisite to the program. To earn the urban studies concentration, students must complete 28 credits, distributed as follows:

1. Core — three of the following four courses: PS 305, ECN 309, SOC 345 or HST 223
2. Electives — three of the following courses (none of the courses may overlap with courses in the student's major and no more than two courses may be taken in a single department): AH 363, HST 302, PSY 326, HRD 331, HRD 364, NCC 161, ECN 356, SOC 315, SOC 331, PS 307, PS 350, PS 353 or PS 455
3. Senior seminar — required of all students: CHD 490 ("Senior Seminar in Urban Studies," described below)
4. Internship — although an urban internship or field experience is not required as part of the concentration, it is strongly suggested that students complete such a course in their major department or another program in the university. Ideally, the internship should be completed before the senior seminar.

Course Offerings

CHD 490 Senior Seminar in Urban Studies (4)
A seminar integrating knowledge of the urban arena through the exploration of diverse topics and the development of substantive research.
Prerequisite: Permission of instructor.

Concentration in Women's Studies

Coodinator: *Virginia Blankenship (Psychology)*

Committee: *Barbara Hamilton (Rhetoric), Melodie Monahan (English), Janice Schimmelman (Art History), Mary Otto (Research and Academic Development), Hoda Abdel-Aty Zohdy (Engineering), Linda Hildebrand (Kresge Library)*

The women's studies concentration explores the contributions of women through their work and lives, to the arts, the sciences and society. The concentration opens areas of study and research related to women that arise from the various academic disciplines and from women's experience,

uniting and clarifying core concepts and ideas.

Students working toward a women's studies concentration discover information and generate questions that lead to an understanding of the present position of women in society and to the formulation of theories that may explain, predict and improve that position. This interdisciplinary concentration is a humanistic complement to any conventional academic major.

Twenty-eight credits are required for the concentration in women's studies, distributed as follows:

1. WS 200.
2. A combination of any three women's studies core courses: WS 300 "Women in Transition", 301 "Special Topics" and 401 "Advanced Topics in Women's Studies". The content and instructor for WS 301 and 401 change from semester to semester; therefore, students may receive credit for more than one WS 301 and 401 class.
3. WS 101 "Introductory Topics", 201 "Topics in Women's Studies" and approved women's studies electives (a list of women's studies electives for the current semester is available in the *Schedule of Classes* or from the concentration coordinator).

Course Offerings

WS 101 Introductory Topics in Women's Studies (4)
Course content varies. May include women and history.

WS 200 Introduction to Women's Studies (4)
Core course provides an overview of women's studies theories and methods. Strictly interdisciplinary and comparative in approach, offering a general education in women's studies literature, history, economics and culture.

WS 201 Topics in Women's Studies (4)
Course content varies. Representative topics are history of women since 1750 and history of the American family.

WS 300 Women in Transition (4)
Focuses on life experiences unique to women. Major issues include identity and independence, marriage, childbirth, adulthood and aging.

WS 301 Special Topics in Women's Studies (4)
Course content varies. Representative topics are women in art, women and literature, psychology of women, anthropology: women's lives, women and public policy.

WS 400 Directed Project in Women's Studies (2, 4)
Project may focus upon scholarly research or may involve field work or community activism around issues of importance in women's studies.
Prerequisite: Approval of faculty adviser and women's studies coordinator.

WS 401 Advanced Topics in Women's Studies (4)
Course content varies. Representative topics include research methods in women's studies.

Prelaw Studies

Students planning to attend law school after graduation should major in a field in which they have both interest and aptitude; the actual field is less important for admission than the overall success of the student in college training as measured by the cumulative grade point average and scores on the Law School Admission Test (LSAT).

Rather than mastery of any particular subject matter, law schools require of incoming students certain basic skills, particularly the ability to think logically and to express oneself orally and in writing in a coherent and precise manner. No one academic discipline possesses a monopoly on development of these abilities. The best advice to students planning legal careers is to develop strong writing skills and to plan undergraduate course study with an eye toward long-term plans within the legal profession.

Although there is no formal prelaw curriculum at Oakland University because no set of specific courses is necessary for admission to, or success in, American law schools, the attention of students interested in law is drawn to courses in five categories. None of these courses is in any sense required, or even strongly recommended, for all prelaw students; yet the experience of many lawyers and law students suggests that they will be helpful to some.

I. The first category consists of courses that develop fundamental abilities of reasoning and communication. Introductory courses in all of the liberal arts disciplines (humanities and natural and social sciences) serve this purpose. Particularly relevant are courses that develop thinking and writing capabilities. These include: ENG 380, PHL 102 and PHL 103.

II. A second group, devoted to oral communication, includes: SCN 201, SCN 220, SCN 301, THA 267 and THA 350.

III. A third group features law in relationship to other disciplines. The university offers many courses placing law and legal institutions in such a context. These include: AN 440, ECN 378, HST 303, PHL 319, PS 241, PS 342, PS 343, SOC 322, SOC 324 and SOC 437.

IV. A fourth group of courses has do with business operations, an aspect of the practice of law that is often overlooked. The increase in numbers and competition within the bar have placed unprecedented emphasis on business skills. These courses include: ACC 200, FIN 320, MIS 300 and MKT 302.

V. A fifth group, substantive law courses, may be of special interest to students who do not have a definite intention of applying to law school but who wish to be better informed about the law, to experience the special style of legal instruction or to gather enough information to make a final decision about a legal career. These courses include: ENV 461, JRN 403 and MGT 424.

Students considering law school are warned against overemphasizing law-related courses in their undergraduate training. Law schools virtually never give credit, either for placement or for graduation, for such courses and are inclined to believe such students are too narrow in their education. Undergraduate education is a distinct and vital part of one's professional training and should never be regarded simply as a way station before beginning one's "real" work. It must be emphasized that none of the courses listed here is required of, or restricted to, prelaw students.

Students interested in the Legal Assistant Program instead of preparation for law school should see page 143 of this catalog. The College of Arts and Sciences also offers a concentration in social justice and corrections (see page 186).

Off-campus Studies Programs

The College of Arts and Sciences administers an off-campus independent study program that allows a student to propose his or her own course of study for the semester off campus. The following standards and procedures apply:

1. Any undergraduate student in good standing is eligible to participate in the program after completion of two semesters in residence.
2. A written proposal describing a course of activity will be prepared by the student applicant before beginning the program.
3. The above written proposal and the off-campus work it describes must receive support and involvement of at least three faculty members and approval of the dean.
4. All arrangements for off-campus work must be completed and filed with the office of the dean during the semester preceding the semester of off-campus study.
5. Part of the preparatory work must include the designation of course equivalents totaling at least 8 credits for the independent study to be accomplished. This is to be negotiated with supporting faculty members.
6. Whenever credit is sought toward completion of a major, the department, through its chairperson, must agree to the value of the independent work.

7. The dean of the college will require a release from parents absolving the university of responsibility for the well-being of students under 18 years of age while they are participating in an off-campus independent study.
8. The initial approval of a program for a student will be for one semester with the provision that the student may request an extension of the program for additional semesters.
9. The student must be registered at Oakland University and pay the required fees during the independent study period.

Students interested in overseas study programs sponsored by other universities and organizations, both domestic and foreign, should contact the Study Abroad Office, 430 Wilson Hall. Information on work-study opportunities sponsored by institutions other than Oakland University can be obtained from the Department of Placement and Career Services, 275 Vandenberg Hall West, and from the Center for International Programs, 430 Wilson Hall.

Teaching Minors in Science

Coordinator: *Sheldon L. Appleton (Associate Dean, College of Arts and Sciences)*

The liberal arts teaching minor in science requires at least 24 credits selected from courses, approved by a faculty adviser, offered in biological sciences, chemistry and physics. Course selections cover two of the three disciplines and must include 12 credits in each discipline applied to the minor. All courses must be at the levels of BIO 190, CHM 144 and PHY 101 or above. They may not include courses in the student's major discipline. Two options are available.

The following requirements apply to the two-science minor:

1. Complete at least 8 credits as well as laboratory in each of the two sciences selected from the following: BIO 190, 195 and 200; CHM 144, 145 and 149 (or CHM 164, 165 and 149); or PHY 101, 102 and 158 (or PHY 151, 152 and 158).
2. Complete at least 8 additional credits from either one science or split between the two sciences.

The following requirements apply to the three-science minor:

a. Complete BIO 190, 195 and 200; CHM 144, 145 and 149 (or CHM 164, 165 and 149); and PHY 101, 102 and 158 (or PHY 151, 152 and 158).

Students who elect a single discipline minor in either biology, chemistry or physics are not eligible for the science minor, nor are students majoring in biochemistry, biology, chemistry, computer and information science, engineering, environmental health, industrial health and safety, medical physics, medical technology, nursing, physical therapy or physics.

HONORS COLLEGE

Director: *Brian F. Murphy (English)*

Council: *Bandana Chatterjee (Chemistry), Donald C. Hildum (Rhetoric, Communications and Journalism), Vincent B. Khapoya (Political Science), Lewis N. Pino (Chemistry), Norman Susskind (Modern Languages and Literatures), one sophomore, one junior and one senior Honors College student*

The Honors College has been established by the faculty of the College of Arts and Sciences for highly motivated students seeking an unusually challenging undergraduate education. It offers a specially designed general education and additional requirements, in conjunction with a departmental major from the College of Arts and Sciences or one of the professional schools.

Students currently admitted to or enrolled at Oakland University may apply directly to the Honors College for admission; others must apply for admission to Oakland University as well. Application forms are available at the Honors College office.

Courses with the HC prefix are open only to students who have been accepted to the Honors College.

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 Engineering and Computer Science, the School of Health Sciences, the School of Human and Educational Services 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.

All Honors College students must follow specially designated honors tracks in departments where they exist.

General education requirements of the Honors College

1. The student must successfully complete RHT 101 or its equivalent.
2. The student must successfully complete at least four Honors College core courses, chosen from HC 201, 202, 203, 204, 205, 206, 207 or 208.
3. The student must successfully complete at least one 4-credit course in each of the four general education areas not covered by the HC core courses taken. A student may meet this requirement by successfully completing relevant university general education courses, departmental courses that count towards a major, additional HC core courses or a combination of these.
4. The student must successfully complete a senior colloquium, HC 401.
5. The student must attain second-year foreign language proficiency.

Note: Honors College requirements replace university and college general education requirements. Students should not attempt to fulfill both sets of requirements.

Advanced standing

The student shall apply for advanced standing in the Honors College, normally by the end of the fourth semester. Following receipt of the application, the Honors College Council will interview the applicant. The interview will be of a general nature, but will deal, in part, with material studied in the Honors College core courses the student has completed.

After the interview, the council may admit the student to advanced standing, grant the student conditional advanced standing or ask the student to withdraw from the Honors College. Students who are granted conditional advanced standing will be informed why.

Generally, a student will not be considered for admission to advanced standing, or for removal of conditional status, later than the fourth week of the semester following that in which the student completes 80 credits.

Independent project

Each Honors College student must successfully complete a major creative or scholarly work under the supervision of a faculty member. All independent projects must be approved by the Honors College Council prior to proceeding with work. Independent project proposals should be submitted to the council before students complete their junior year. The project must be approved within the first four weeks of the semester following that in which the student completes 96 credits.

The student may receive departmental or Honors College independent study credit for all or part of this work. The student may, but is not required to, register for HC 490.

The project must be independently designed and completed.

Completed independent project reports are due no later than the week following the middle week of the semester in which the student intends to graduate.

Grade point average and graduation honors

A grade point average of at least 3.30 is required for graduation.

Honors College students may receive departmental and university honors upon graduation.

Course Offerings

HC 201 through 208 Honors College Core Courses (4 each)
Introduction to ways of thinking characteristic of a modern university. HC 201 deals with the arts, HC 202 with literature, HC 203 with language, HC 204 with western civilization, HC 205 with international studies, HC 206 with social science, HC 207 with mathematics, logic or computer science and HC 208 with natural science or technology. Offered every other year.

HC 401 Honors College Senior Colloquium (4)
Discussion of a broad topic of traditional concern or an issue of particular current significance. Offered annually.

HC 490 Independent Study (2, 4)
Supervised instruction in the Honors College independent project. May be repeated for credit. Offered each semester.

NEW CHARTER COLLEGE

Co-chairpersons: *Leo Gerulaitis (History) and Irving Torgoff (Psychology)*

Faculty: *Lizabeth A. Barclay (Business Administration), John Beardman (Art and Art History), Peter Bertocci (Anthropology), David C. Bricker (Philosophy), Marc Briod (Education), Richard Brooks (Philosophy), Dolores Burdick (Modern Languages), Harvey Burdick (Psychology), Richard J. Burke (Philosophy), F. James Clatworthy (Education), John Cowlishaw (Biology), Peter Evarts (English), Thomas Fitzsimmons (English), Wilma Garcia (Rhetoric), James Graham (History), Carol Halsted (Dance), Marvin Holladay (Music), Roy Kotynek (History), Vincent Khapoya (Political Science), Margaret Kurzman (Rhetoric), David Mascitelli (English), Donald Morse (English), Margaret Pigott (Rhetoric), Elizabeth Pinkstaff (Nursing), Jacqueline Scherer (Sociology), Robert Stern (Chemistry), Ronald Swartz (Education)*

Adjunct faculty: *Charles Morton (Philosophy), Laurel Torgoff (clinical psychologist), Bernard Travnikar (child counselor)*

Drawing on faculty from departments and schools throughout the university, the New Charter College offers an interdisciplinary individual approach to learning.

The New Charter College does not offer a major or a degree, but degree candidates in any of the university's departments or schools may augment their studies through course work offered by the college. Candidates for the Bachelor of General Studies will find the New Charter College courses to be broad, flexible and challenging.

Academic counseling also is available to students enrolled in New Charter College courses.

Courses at all levels ending in numbers from 11-19 emphasize the creative arts, 21-29 the humanities, 31-39 the social sciences, 41-49 the natural sciences and 51-59 community studies.

Course Offerings

NCC 100 Individual in the University (4)
Exploration of general education in relation to life experiences and career development. Links personal competencies, goals and needs to academic subject matter, the history and structure of the university and critical evaluation of the processes and possibilities of higher learning.

NCC 101 Explorations in Interdisciplinary Studies (2, 4)
An introductory course enabling students to sample various interdisciplinary approaches and to develop broader perspectives on interdisciplinary matter.

NCC 112 Creative Expression (4)
Exploration of communication with self and others within structured forms of dance, music and drama. Visual arts and other media are used to implement expression where appropriate and possible. Graded S/U.

NCC 121 Images of Humanity (4)
Literature as a cross-cultural mirror. Literary works of various types will be explored, with emphasis on the ways that writers look outward in order to reflect the world in which they live.

NCC 122 Alienation in Youth (4)
Problems and questions about why students and adolescents may reject the values of their native society, as well as the difficulties in bringing about genuine change in society and self.

NCC 123 Science Fiction, Detective Stories and the Scientific Method (4)
Using representative works from science fiction, detective stories and the philosophy of science, this class focuses on the effects of scientific discoveries on human life and culture.

NCC 131 Studies in Human Organization (4)
Interdisciplinary introduction to the behavioral sciences. Topics may range from the cross-cultural study of human relations and lifestyles to the dimensions of a contemporary American social problem.

NCC 141 Twentieth Century Science (4)
Exploration of current frontiers in scientific thought and conceptualization, in relation to contemporary society and its problems. No advanced specific knowledge of modern science is required.

NCC 147 History of Science (4)
Several historical periods, from antiquity to the present, are examined to see how the development of science has been influenced by the intellectual climate of the era and how new insights in the sciences have helped shape different societies' perceptions of reality.

NCC 151 Introduction to Urban Studies (4)
Introduction to the interdisciplinary subject matter of urban studies. Guest speakers provide a wide range of perspectives on the problems and possibilities of human growth in modern American cities.

NCC 201 Topics in Interdisciplinary Studies (2, 4)
An intermediate course enabling students to sample various interdisciplinary approaches and to develop broader perspectives on interdisciplinary subject matter.

NCC 210 Study Abroad (2, 4)
An interdisciplinary topic relating to the culture of a foreign country or region, enriched by traveling and living in that area. Readings, discussion and structured itineraries are designed to enhance general understanding of that culture in broader academic perspectives.

NCC 215 African Music as Oral Culture: West African Drumming (4)
West African drum ensemble traditions will be investigated in a performance context and comparisons explored with other musical traditions of indigenous African cultures. Special attention is given to linguistic relationships in the tonality of African music.

NCC 223 Personal Worlds (4)
Philosophical and literary sources are used to explore the dreamlike and dramatic inner quality of personal worlds. Analogies are drawn between the fictional lives of others and the stranger within the self.

NCC 227 Those Were the Days (4)
From a contemporary perspective, cultural history and social alienation in America during the 1950s and 1960s are studied. Themes of alienation as seen by different generations, sexes and ethnic groups are analyzed in relation to popular music, television and film.

NCC 235 Perspectives on Psychic Research (4)
Survey and anlysis of contemporary research into parapsychology and a wide range of observed or purported psychic phenomena — such as clairvoyance, mediumship, faith-healing, precognition, astral projection, etc.

NCC 241 Body and Soul (4)
Explores multiple approaches to self-knowledge, based on the writings of different authors who attempt to integrate human biology with psychology and culture. The question of reality of body and soul is examined in light of a systems approach to the life sciences.

NCC 252 Interpersonal Relationships: Marriage, Family and Divorce (4)
Critical evaluation of individual feelings about tradition and change in marriage and parenthood, male and female roles, sexuality and companionship, marital conflict and divorce, and the single life.

NCC 300 Independent Study (2, 4)
Advanced interdisciplinary reading on a topic of interest to the student, who assumes initiative for planning this reading project in conjunction with New Charter College faculty sponsor and approval of the New Charter College Executive Committee. Graded S/U. Offered every semester.
Prerequisite: Approved NCC contract.

NCC 301 Seminar in Interdisciplinary Studies (2, 4)
An advanced course enabling students to sample various interdisciplinary approaches and to develop broader perspectives on interdisciplinary subject matter. Offered every year.
Prerequisite: Previous NCC course work or permission of instructor.

NCC 310 Creative Arts Contract (2, 4)
Opportunity to develop artistic skills within context of aesthetic history and criticism. Student must submit learning contract, signed by New Charter College faculty sponsor and approved by the New Charter College Executive Committee, by way of applying for permission to take this class. Graded S/U.
Prerequisite: Approved NCC contract.

NCC 321 Remedial Wisdom (4)
Confronts the student with the totality of problems facing an educated person today and explores various attempts to solve them.
Prerequisite: Senior standing or permission of instructor.

NCC 334 Human Sexuality (4)
Explores notion that sexuality connotes totality of being — the full expression of femaleness and maleness. Various cultural paradigms of the nature of sexuality are explored; the biosocial nature of sexuality and the functional identity of mind and body are examined.

NCC 336 Ways of Knowing (4)
Intensive exploration of personal integration and growth, bridging reading with experience, through the study of humanistic psychology, transactional analysis, bio-energetic theory and technique, and Jungian syntheses.
Prerequisite: Permission of instructor.

NCC 351 The Geography of Values (4)
Explores community values in the context of change and development. Changing values and community development in local areas are researched and analyzed for a deeper understanding of the techniques and uses of social cartography.
Prerequisite: Previous NCC course work or permission of instructor.

NCC 400 Independent Research (2, 4)
Advanced interdisciplinary research on a topic of interest to the student. Student assumes initiative for planning research in conjunction with New Charter College faculty sponsor and approval of the New Charter College Executive Committee. Substantive, well-documented paper is required.
Prerequisite: Approved NCC contract.

CENTER FOR THE ARTS

Director: *Carl F. Barnes, Jr.*

Assistants to the director: *T. Andrew Aston, Walter Mark Hill*

Publicity manager: *Julie L. Glynn*

Interim booking manager: *Kristy Ann Mitchell*

Interim recital hall manager: *Rock Gunnoe*

The Center for the Arts is an administrative unit of the College of Arts and Sciences. It develops, coordinates and promotes the university's public undergraduate performances and presentations in art history, dance, film studies, mime, music, studio art and theatre.

Each academic year, the center sponsors a subscription series of theatrical, musical and dance events featuring guest artists and groups, and faculty and students from the Department of Music, Theatre and Dance.

The center also sponsors special arts and arts-related events, including annual summer arts camps for youngsters, workshops throughout the year in various arts disciplines, special presentations at Meadow Brook Hall and art tours to foreign countries.

The center works with the university's professional arts enterprises, the Meadow Brooks, to promote cooperation between Oakland University's professional and academic arts undertakings.

SCHOOL OF BUSINESS ADMINISTRATION

Dean: *Ronald M. Horwitz*

Office of the Dean: *John E. Tower, associate dean; Kathleen G. Clark, undergraduate academic advising coordinator; Carole J. Terry, undergraduate academic adviser; Julie Dziekan-Schueren, administrator of the Master of Business Administration program; Frank P. Cardimen, director, Center for Economic Development and Corporate Services*

Department chairs: *Daniel N. Braunstein, Management and Marketing; David P. Doane, Management Information Systems and Quantitative Methods; David D. Sidaway (acting chair), Accounting and Finance; Ronald L. Tracy, Economics*

Professors: *Eleftherios N. Botsas, Daniel N. Braunstein, Joseph E. Champagne, Alice C. Gorlin, Karl D. Gregory, Ronald M. Horwitz, Robbin R. Hough, Sid Mittra, Miron Stano*

Associate professors: *David P. Doane, Augustin K. Fosu, Oded Izraeli, Paul O. Kingstrom, Kevin J. Murphy, Ravi Parameswaran, Alan Reinstein, Howard S. Schwartz, Ronald L. Tracy, John E. Tower, Mary P. Van Sell*

Assistant professors: *Lizabeth A. Barclay, Sadik Cokelez, Theresa M. Cross, J. David Diltz, Sherman T. Folland, Harold Hotelling, Scott A. Monroe, Soo-Young Moon, J. Austin Murphy, Kevin Nathan, Eileen Peacock, Gerald V. Post, Maureen H. Smith, Floyd G. Willoughby*

Special instructor: *David D. Sidaway*

Adjunct professors: *Rikuma Ito, Paul F. Lorenz*

Visiting assistant professors: *Paul W.F. Chao, Margit A. Jackson, Anandi P. Sahu*

Visiting instructors: *Bruce W. Himrod, Amir M. Hormozi, Barbara T. Kiwicz, Robert T. Kleiman, Thomas W. Lauer*

Lecturers: *David W. Essig, Robert J. Forbes, Jacquelynne K. Genova, David Medved, Matthew Mendrygal, Douglas R. Munro, Dennis M. Polak, Robert H. Schappe, Thomas H. Williams*

Board of Visitors

The Board of Visitors provides a direct link between the industrial community and the School of Business Administration. The board is comprised of outstanding corporate and professional leaders from the Detroit metropolitan area. Board members assist the faculty on several projects and provide consultation on goals and objectives, curricula designs and research programs.

The board members are:

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Undergraduate Programs

The School of Business Administration offers undergraduate programs for students interested in obtaining the skills and information needed to manage profit-making businesses, not-for-profit enterprises (e.g., health care institutions, educational institutions, cooperative societies) and governmental units. The programs include:

Bachelor of Arts, with a major in economics (offered in conjunction with the College of Arts and Sciences; see page 68 for a description of this program), and

Bachelor of Science, with majors in accounting, economics, finance, general management, human resources management, management information systems or marketing; and minors in accounting, economics, finance, international management, management or quantitative methods

The Master of Business Administration Degree

The School of Business Administration offers the Master of Business Administration (MBA) degree for superior undergraduate students in any major, including business and management. The MBA is a professional program in business designed for individuals who did not major in business or management at the undergraduate level.

Accelerated program

Oakland University undergraduates working on majors other than those in the management areas may earn both an undergraduate degree and an MBA by completing an accelerated program. To be eligible, students should have a grade point average in the top 15 percent of students in their major. Students may apply to the program after they have completed 80 undergraduate credits.

For more information, see the *Oakland University Graduate Catalog.*

Cooperative Education

Students in the School of Business Administration who want to combine relevant work experience with their college educations are encouraged to participate in the university's cooperative education program. Co-op students alternate at least two four-month periods of paid, full-time work experience with four-month periods of full-time classwork. Students are placed in jobs similar to those held by recent Oakland University graduates in business, not-for-profit or governmental organizations. On occasion, unpaid internships that provide work experience also are available.

Awards and Honors

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: Each year, the Detroit chapter of the American Marketing Association awards certificates of achievement for scholarship and service to two marketing majors.

Ernst & Whinney Award: Each year, the junior accounting student who has demonstrated the greatest academic and leadership potential is selected by the accounting faculty to receive a cash award from the international accounting firm of Ernst & Whinney. The student is honored at a meeting of accounting students, hosted by Ernst & Whinney.

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 School of Business Administration.

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

Ross Roy, Inc. Award: Ross Roy, Inc. annually awards a certificate to the marketing student who has demonstrated the most outstanding achievement in the field of advertising and promotional strategy.

Wall Street Journal Student Achievement Award: This award is presented annually to the graduating senior who has demonstrated the greatest academic and leadership achievement in the School of Business Administration. Selection is made by the faculty.

School honors are awarded by the School of Business Administration to students with a minimum grade point average of 3.33 in courses offered in the school.

General Requirements for the Bachelor of Science Degree

The curriculum described shall be followed by students entering the School of Business Administration beginning with the fall 1986 semester. Students enrolled prior to fall 1986 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 admitted to the School of Business Administration, provided that catalog is not more than six years old at the time of graduation. Students who transfer to the School of Business Administration 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.

To ensure they have met all requirements, students should seek a final program audit from one of the school's academic advisers the semester before the semester in which they plan to graduate. The responsibility for meeting graduation requirements rests with the student.

The Bachelor of Science degree requirements follow, after which the specific requirements of business administration majors in accounting, finance, general management, human resources management, management informations systems and marketing are detailed. The requirements for the economics major are listed separately.

Each student must:

1. Complete at least 128 credits.
2. Complete at least 32 credits at Oakland University, of which at least 16 credits must be in courses offered by the School of Business Administration. Of these 16 credits, at least 8 credits must be in the student's major.
3. Complete at least 32 credits at the 300 level or above.
4. Take, at Oakland University, the last 8 credits needed to complete baccalaureate requirements.
5. Earn a cumulative grade point average of at least 2.00 in courses taken at Oakland University or the School of Business Administration.
6. Obtain certification of writing proficiency, as described on page 25.
7. Complete the university general education requirement (see pages 25-28).
8. Be admitted to major standing.
9. Complete the requirements for one of the majors in the School of Business Administration.
10. Be in substantial compliance with all legal curricular requirements.

Requirements for the Business Administration Program

The business administration program enables students to combine intensive study of a functional area of business with a broad background in management. This combination will allow

students to understand and manage changing situations in profit-oriented enterprises or not-for-profit organizations, both public and private. In this program, a general education is combined with rigorous analytical training, enabling students to handle the increasingly complex and changing problems faced by managers.

The business administration program offers students the opportunity to major in general management or in one of the functional areas of business: accounting, finance, human resources management, marketing or management information systems. The program leads to a Bachelor of Science (B.S.) degree. (In addition to the majors listed above, the School of Business Administration offers a Bachelor of Science degree with a major in economics. See page 204.)

The business administration degree program consists of four parts: general education, the precore, the core and the major. Students in this program must satisfy the specific requirements of each of these parts and must earn a minimum of 128 credits.

I. General education requirements

Students in the School of Business Administration must satisfy the university general education requirements, described on pages 25-28. These requirements may be summarized as one course from the approved lists in each of the following categories: arts; literature; language; western civilization; international studies; social sciences (School of Business Administration students cannot use ECN courses to satisfy this requirement); natural science and technology; and mathematics, logic and computer science (this category is automatically satisfied by the school's precore mathematics requirement).

II. Precore requirements

As preparation for the various majors of the business administration program, students must successfully complete a program that consists of courses in writing, mathematics, computer use, economics, accounting and statistics.

The required precore courses are:

RHT 100-101	Composition I-II (or complete the writing proficiency requirement in another manner)	0-8
MTH 111-112*	Elementary-Intermediate Algebra (if required, based on the math placement test)	0-8
MTH 121	Linear Programming, Elementary Functions	4
MTH 122	Calculus for Social Sciences (or MTH 154)	4
CSE 125	Introduction to Computer Use	4
ECN 200	Principles of Macroeconomics	
and ECN 201	Principles of Microeconomics	
or ECN 210	Principles of Economics (a 6-credit course which covers the material of both ECN 200 and ECN 201)	6-8
ACC 200	Introductory Financial Accounting	4
ACC 210	Managerial and Cost Accounting	4
QMM 250	Statistical Methods	6
		32-50

The freshman and sophomore years of study for students pursuing the business administration program will be devoted to the successful completion of the general education and precore course requirements. Special emphasis should be given during the freshman year to the completion of the university composition requirement and steady progress in the mathematics sequence. Once sophomore status (28 credits) has been achieved, students will begin work on the economics, accounting and statistics requirements.

*See special information concerning these courses on page 97.

Admission to major standing in business administration

To be eligible to take most 300-level courses in the core and major programs (excluding ECN courses) and all 400-level courses, students must be admitted to major standing in the School of Business Administration. Courses for which major standing is not a prerequisite are ACC 310, ENG 382, MKT 302, ORG 330 and all ECN courses.

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 proficiency requirement.
3. A minimum cumulative grade point average of 2.80 or above in all courses taken for the precore program at Oakland University **and at all previous colleges.**
4. A minimum grade of 2.0 in each of the following precore courses or their equivalents: MTH 121, MTH 122, CSE 125, ECN 200 and ECN 201 (or ECN 210), ACC 200, ACC 210 and QMM 250.
5. Submission of an "Application for Major Standing" for the desired major **during the first month** of the semester in which the student expects to complete the precore requirements.

III. 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. The core courses required in all business administration major programs are:

ENG 382	Business and Technical Writing (or ENG 380)	4
ECN 301	Intermediate Microeconomics	4
ORG 330	Introduction to Organizational Behavior	4
ORG 331	Organizational Behavior Applied to Management	4
FIN 322	Managerial Finance I	4
MIS 300	Management Information Systems	2
MKT 302	Marketing	4
QMM 343	Operations Management	4
MGT 435	Management Strategies and Policies	4
		34

All courses in the core program require major standing except ENG 382, ECN 301, ORG 330 and MKT 302. MGT 435 is a course that integrates the material in the core program and may be taken only after students have completed the rest of the core program.

IV. Major programs

Students complete their program by taking 16-22 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 4 credits of independent study (490 courses) may be used to meet the major elective requirement.

Requirements for the major in accounting

Major adviser: *David D. Sidaway*

The major in accounting prepares students for an accounting or auditing career in the public or private sector of profit-oriented or not-for-profit enterprises.

To fulfill requirements for the accounting major, students must be admitted to major standing in accounting, complete the core program and earn the 30 credits specified below with a grade of 2.0 or better in each course.

Required precore courses:		**Credits**
ACC 200	Introductory Financial Accounting	4
ACC 210	Managerial and Cost Accounting I	4

Required major courses:		
ACC 310	Intermediate Financial Accounting I	3
ACC 311	Intermediate Financial Accounting II	3
ACC 312	Advanced Financial Accounting	4
ACC 410	Managerial and Cost Accounting II	4
Electives — Choose 8 credits:		
ACC 411	Auditing	
ACC 412	Government and Not-for-profit Accounting	
ACC 413	Regulatory Agencies and the Accounting Profession	
ACC 414	Accounting Theory	
ACC 415	Tax Accounting	
ACC 416	Contemporary Accounting Issues	
ACC 418	Computer-based Accounting Systems	
ACC 420	Advanced Auditing Topics	
ACC 421	Advanced Tax Topics	
FIN 419	International Accounting and Financial Management	8
		30

Because of their specific requirements, students who plan to take a professional accounting examination (CPA, CMA or CIA) should discuss their course selection with an accounting faculty member before enrolling in 400-level accounting courses.

Note: Fifth Year Option. Although it is not required, the School of Business Administration suggests that students planning to take the Certified Public Accounting (CPA) examination consider taking an additional 32 credits of study in accounting, as recommended by the American Institute of Certified Public Accountants. During this fifth year, students should take the following 32 credits: 20 credits of 400-level accounting courses (in addition to the courses required for the four-year accounting major), FIN 422, MGT 424 and an additional quantitative methods course.

Requirements for the major in finance

Major adviser: *J. Austin Murphy*

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 accounting and 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 22 credits, as specified below, with a grade of 2.0 or better in each course.

		Credits
Required core courses:		
FIN 322	Managerial Finance I	4
Required major courses:		
ACC 310	Intermediate Financial Accounting I	3
ECN 321	Money, Credit and the Economy	4
FIN 421	Investment Analysis	4
FIN 422	Managerial Finance II	4
Electives — Choose one course from the following (some may require additional prerequisites):		
ACC 311	Intermediate Financial Accounting II	
ACC 410	Managerial and Cost Accounting II	
ACC 415	Tax Accounting	
ECN 373	International Economics and Finance	
ECN 456	Public Finance	
FIN 419	International Accounting and Financial Management	3-4
		22-23

Requirements for the major in general management

Major adviser: *Floyd G. Willoughby*

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 and earn 16 additional credits in electives with a grade of 2.0 or better in each course. The electives may be chosen from any area within the School of Business Administration (courses beginning with ACC, ECN, FIN, MGT, MIS, MKT, ORG or QMM) and must be chosen from courses numbered 300 or higher; at least 8 credits must be at the 400-level. No more than 4 credits of independent study (490 courses) may be used to meet the major elective requirement.

Requirements for the major in human resources management

Major adviser: *Daniel N. Braunstein*

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, personnel 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 tools and techniques needed to acquire, develop and utilize an organization's human resources. The program includes broad coverage of such topics as personnel psychology, personnel 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 the 28 credits specified below with a grade of 2.0 or better in each course.

Required core courses:		**Credits**
ORG 330	Introduction to Organizational Behavior	4
ORG 331	Organizational Behavior Applied to Management	4
Required major courses:		
ORG 430	Organizational Research Methods	4
MGT 433	Labor-Management Relations	4
ORG 434	Management of Human Resources	4
Electives — Choose two courses:		
ORG 431	Leadership and Group Performance	
ORG 432	Motivation and Work Behavior	
ORG 480	Topics in Organizational Behavior	
ECN 468	Labor Economics	8
		28

Requirements for the major in management information systems

Major adviser: *David P. Doane*

The major in management information systems specifies a set of courses that will give students more facility with computer languages, with the use of computers in handling information processing in organizations, with systems analysis and with the use of computers in management decision making and support of organizational functions.

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 the 26 credits specified below with a grade of 2.0 or better in each course.

Required precore and core courses:		**Credits**
CSE 125	Introduction to Computer Use	4
MIS 300	Management Information Systems	2

Required major courses:		
CSE 130	Introduction to Computer Programming (Pascal)	4
or CSE 132		
CSE 220	Computer-based Information Systems I (COBOL)	4
MIS 316	Systems Analysis	4
Electives — Choose two courses, at least one of which is a 400-level MIS course:		
MIS 400	Analysis of Complex Systems	
MIS 404	Data Base Management/Data Communication	
MIS 407	Computer Systems for Problem Solving	
MIS 436	Information Processing and Decision Making	
MIS 444	Simulation in Management	
ACC 418	Computer-based Accounting Systems	
QMM 452	Forecasting	
CSE 221	Computer-based Information Systems II (COBOL)	
CSE 340	File Systems Design	
CSE 345	Data Base Design and Implementation	
		8
		26

Requirements for the major in marketing

Major adviser: *Paul W.F. Chao*

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.

To fulfill the requirements for the major in marketing, students must be admitted to major standing in marketing, complete the core program and complete the 24 credits specified below with a grade of 2.0 or better in each course.

		Credits
Required core course:		
MKT 302	Marketing	4
Required major courses:		
MKT 353	Marketing Management	4
MKT 404	Consumer Behavior	4
MKT 405	Marketing Research	4
Electives: Choose two courses:		
MKT 406	Promotional Strategy	
MKT 420	Distribution Channels Management	
MKT 430	Sales Management/Sales Promotion	
MKT 450	International Marketing	
MKT 480	Seminar in Marketing	8
		24

Bachelor of Science With a Major in Economics

Major adviser: *Ronald L. Tracy*

The curriculum for the major in economics combines the concepts and tools of economic analysis, 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, businesses, the nation and the world today.

Besides preparing the student for a career in economics, an education in economics is excellent preparation for entry into law school, a graduate school of public administration or an M.B.A. program. Economics is a flexible choice for students seeking a rigorous, well-respected and relevant major without specializing in a narrowly defined area. To be employed as a professional economist or an economics instructor, a student normally will need to attend graduate

school and obtain at least a master's degree in economics.

For economics majors, the Bachelor of Science degree offers a more quantitative and business-oriented approach to economics than the Bachelor of Arts economics major, offered through the College of Arts and Sciences (see page 68).

Requirements for the Bachelor of Science degree with a major in economics

To earn the Bachelor of Science degree with a major in economics, students must complete 128 credits as follows:

		Credits
English composition:		
RHT 100-101	Composition I-II (or complete the writing proficiency requirement in another manner)	0-8
ENG 382	Business and Technical Writing (or ENG 380)	4
General education requirements		28

(As detailed on pages 25-28, with the exceptions listed for students in the School of Business Administration on page 200).

Cognate courses:		
MTH 111-112*	Elementary-Intermediate Algebra (if necessary)	0-8
MTH 121	Linear Programming, Elementary Functions	4
MTH 122	Calculus for Social Sciences (or MTH 154)	4
CSE 125	Introduction to Computer Use (or CSE 130 or CSE 132)	4
ACC 200	Introductory Financial Accounting	4
QMM 250	Statistical Methods	4
FIN 322	Managerial Finance I	4
Quantitative methods course — choose one:		
ECN 405	Econometrics	4
QMM 452	Forecasting	
Required core courses:		
ECN 200	Principles of Macroeconomics	
and ECN 201	Principles of Microeconomics	
or ECN 210	Principles of Economics (a 6-credit course that covers ECN 200 and ECN 201)	6-8
ECN 301	Intermediate Microeconomics	4
ECN 302	Intermediate Macroeconomics	4
Electives: 16 additional credits in ECN courses numbered 300 or higher, 8 credits of which must be in courses at the 400 level. No more than 4 credits in ECN 490 may be counted as economics electives.		16
General electives:		18-36
		128

The suggested economics precore program sequence is the same as the one suggested on page 200 for business students.

*See special information concerning these courses on page 97.

Admission to major standing in economics

Admission to major standing in economics is required before a student may graduate. The minimum requirements for major standing are:

1. Student's admissibility to and retention in the university.
2. Completion of the writing proficiency requirement.
3. Completion of the following courses, or their equivalents, with a grade of 2.0 or better in each course: MTH 121, MTH 122, CSE 125 (or CSE 130 or CSE 132), ECN 200 and ECN 201 (or ECN 210), and QMM 250.

4. Approval of an "Application for Major Standing."

Although ECN 301 and ECN 302 are not required for admission to major standing in economics, students must earn a grade of 2.0 or better in them in order to graduate.

Minors

The School of Business Administration offers six 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.

To earn a minor, students must complete the prescribed courses with a grade of 2.0 or better in each course. Students majoring in programs offered outside the School of Business Administration may take 300- and 400-level courses if they meet the prerequisites (except for major standing) and if there is space in the class. School of Business Administration students have priority over students from outside the school when registering for courses.

All students who are not majors in the School of Business Administration and economics majors in either the School of Business Administration or the College or Arts and Sciences, whether they have applied for a minor or not, are limited to no more than 28 credits in business courses. The maximum of 28 credits includes courses taken at Oakland University and all previous colleges. Economics (ECN) courses, QMM 250 and QMM 452 are excluded from this requirement. Therefore, students from majors outside the business administration program may not earn more than 28 credits in transfer plus Oakland credits in ACC, FIN, MGT, MIS, MKT, ORG or QMM courses (excluding those noted above).

Students may earn only one minor from the School of Business Administration. Business administration majors may earn minors only in economics, international management or quantitative methods. Transfer students planning to earn a minor must earn at least 12 credits toward the minor at Oakland University; at least 8 of these 12 credits must be in courses at the 300-level or higher.

Minor in accounting

Coordinator: *David D. Sidaway*

The minor in accounting consists of the following 20 credits and any prerequisites for these courses: ACC 200, ACC 210 and 12 additional credits in accounting (ACC) courses. This minor is not available to students majoring in programs offered by the School of Business Administration.

Minor in economics

Coordinator: *Ronald L. Tracy*

The minor in economics consists of a minimum of 18 credits, described as follows, and any prerequisites for these courses: ECN 150 or ECN 210 or both ECN 200 and ECN 201, and 12 additional credits in economics (ECN) courses (16 credits if the student took ECN 150). This minor is open to all students except economics majors.

Minor in finance

Coordinator: *Karl D. Gregory*

The minor in finance consists of the following 22 credits and any prerequisites for these courses: ACC 200, QMM 250, FIN 322 and 8 additional credits in finance (FIN) courses. This minor is not available to students majoring in programs offered by the School of Business Administration.

Minor in international management

Coordinator: *Eleftherios N. Botsas*

The minor in international management consists of a minimum of 18 credits, described as follows, and any prerequisites for these courses: Second-year proficiency in a foreign language, ECN 210 or both ECN 200 and ECN 201, ECN 373, MGT 423 and one course chosen from ECN 326, ECN 341, ECN 350, FIN 419 and MKT 450. This minor is open to all majors.

Minor in management

Coordinator: *Scott A. Monroe*

The minor in management consists of a minimum of 22 credits, described as follows, and any prerequisites for these courses: ECN 210 or both ECN 200 (or ECN 150) and ECN 201, ACC 200, ORG 330 and 8 additional credits in 300- and 400-level electives (ACC, FIN, MGT, MIS, MKT, ORG or QMM courses) offered by the School of Business Administration. Economics (ECN) 300- and 400-level courses are not acceptable electives for this minor. Economics majors, both B.A. and B.S. candidates, are eligible for this minor but students majoring in other programs offered by the School of Business Administration are not.

Minor in quantitative methods

Coordinator: *David P. Doane*

The minor in quantitative methods consists of a minimum of 20 credits, described as follows, and any prerequisites for these courses: CSE 130 or CSE 132, QMM 250 or STA 226, and three courses chosen from QMM 343, ECN 405, QMM 440, QMM 448, QMM 452, STA 323 and STA 324. This minor is open to all majors.

Unsatisfactory Performance

Numerical grades less than 2.0 and U grades are considered substandard. A course in which a grade below 2.0 has been earned may not be subsequently passed by competency examination or independent study. A student within the School of Business Administration who repeats a course in which a 2.0 is required must repeat that course at Oakland University, or with prior approval, at any regionally accredited four-year institution, in order that credit be granted toward a degree in the School of Business Administration.

Prerequisites

In planning their schedules, students should ensure that they satisfy prerequisite and corequisite conditions for courses. Students who have registered for courses for which they do not meet the conditions will have their registration canceled and will be liable for any financial penalties incurred.

Course Offerings

Following are descriptions of the courses offered by the School of Business Administration. Required precore and core courses for students majoring in these programs are generally offered each fall and winter semester and during either the spring or summer session.

The 300- and 400-level courses are designed for students with major standing in the School of Business Administration. These courses have major standing as a prerequisite, except for ACC 310, MKT 302, ORG 330 and all economics (ECN) courses. The 300-level courses should be taken during the junior year (59-90 credits). Nonbusiness majors may elect 300- or 400-level courses if they meet the prerequisites (except for major standing) and if there is space in the class. School of Business Administration students have priority over majors from outside the school when registering for these courses.

Students in majors other than those in the business administration program (i.e., accounting, finance, general management, human resources management, management information systems and marketing) may not earn more than 28 credits in ACC, FIN, MGT, MIS, MKT, ORG and QMM courses. This maximum of 28 business credits includes credits earned at Oakland University and all other colleges but excludes economics (ECN) courses, QMM 250 and QMM 452.

ACCOUNTING

ACC 200 Introductory Financial Accounting (4)
Introduction to accounting information as an aid to decision-making 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: Sophomore standing.

ACC 210 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 relationship; product cost accounting and control systems; operations and capital budgeting, and related behavioral, reporting and information processing aspects.
Prerequisite: ACC 200.

ACC 310 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: ACC 200 and ACC 210.

ACC 311 Intermediate Financial Accounting II (3)
A continuation of ACC 310. Major financial accounting areas examined include stockholders' equity, dilutive securities, investments, income measurement issues and the preparation and analysis of financial statements.
Prerequisite: ACC 310 and major standing.

ACC 312 Advanced Financial Accounting (4)
Topics include accounting and reporting for foreign operations, partnerships, consolidated entities, interim financial statements, segments of business enterprises, foreign operations, trusts and estates.
Prerequisite: ACC 311 and major standing.

ACC 410 Managerial and Cost Accounting II (4)
An analysis of available procedures and techniques to sharpen accounting analyses for managerial planning and control. Extends subjects introduced in ACC 210 to nonmanufacturing firms, decentralized firms, transfer pricing and segment performance measurement.
Prerequisite: ACC 210, major standing and senior standing.

ACC 411 Auditing (4)
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: QMM 250, ACC 312 and major standing.

ACC 412 Government and Not-for-Profit Accounting (2)
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, eleemosynary and other nonprofit entities are discussed.
Prerequisite: ACC 311 and major standing.

ACC 413 Regulatory Agencies and the Accounting Profession (2)
The nature, origin and workings of the SEC, ICC and other agencies are examined. The legal framework, registration and reporting requirements, professional liability and the continuing issue of establishing generally accepted accounting principles are studied.
Prerequisite: ACC 311 and major standing.

ACC 414 Accounting Theory (4)
Selected topics of current interest in accounting theory. Opinions of the Accounting Principles Board, the Financial Accounting Standards Board and similar standard-setting committees of the accounting profession will be examined.
Prerequisite: ACC 312 and major standing.

ACC 415 Tax Accounting (4)
The concepts of taxation. The essential logic underlying the federal tax laws will be explored. The class will teach students to analyze individual and corporate income tax laws, rather than how to prepare tax returns.
Prerequisite: ACC 311 and major standing.

ACC 416 Contemporary Accounting Issues (4)
An examination of the changes in accounting associated with infusions of theories of other disciplines: behavioral science, organizational theory, economic theory and sociology. Also considered are changes in the role of the accountant. The course may be repeated.
Prerequisite: ACC 312 and major standing.

ACC 418 Computer-based Accounting Systems (4)
A study of the use of accounting information as part of a total management information system. Topics include financial controls, transaction data processing, internal security and auditing. Covers computer hardware, software and data systems analysis.
Prerequisite: ACC 200, MIS 300 and major standing.

ACC 420 Advanced Auditing Topics (2)
Examination of advanced topics in auditing. Emphasizes philosophy, standards, concepts and problem areas.
Prerequisite: ACC 411 and major standing.

ACC 421 Advanced Tax Topics (2)
Examination of advanced topics in tax accounting.
Prerequisite: ACC 415 and major standing.

ACC 490 Independent Study (2, 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.
Prerequisite: An overall grade point average of 3.00 or better, major standing and an approved contract prior to registration.

ECONOMICS

ECN 150 Basic Economics (4)
Survey of economics and its application to problems faced by societies, firms and individuals. Includes both analytical and institutional aspects of economics. Intended for students not planning to major in economics or business. *Satisfies the university general education requirement in social science.*
Prerequisite: High school algebra.

ECN 200 Principles of Macroeconomics (4)
Examines the methodology of economics, scarcity, opportunity cost, supply and demand, market processes, determination of national income, fiscal policy, money and banking, monetary policy, inflation and unemployment, trade and international adjustments, development and alternative economic systems. Not open to students who have completed ECN 150. *Satisfies the university general education requirement in social science.*
Prerequisite: High school algebra and sophomore standing.

ECN 201 Principles of Microeconomics (4)
Examines elasticity, markets, theory of consumer demand, market failures, organization of the firm, production and cost in the long and short runs, competition, externalities, legal and regulatory environment of business.
Prerequisite: ECN 200 or ECN 150.

ECN 210 Principles of Economics (6)
Principles of macroeconomics and microeconomics, covering the same topics as ECN 200 and ECN 201 combined, but at an accelerated pace. Intended for highly motivated students with good writing and math ability. Not open to students who have completed a previous college economics course. *Satisfies the university general education requirement in social science.*
Prerequisite: High school algebra, sophomore standing and a GPA of 3.00 or better.

ECN 301 Intermediate Microeconomics (4)
Examines consumer behavior, cost functions, constrained optimization, decisions under uncertainty, price and output determination in competitive markets, the basis for regulatory law and implications of microeconomic decisions for the efficiency of the market economy. Case studies will be analyzed.
Prerequisite: ECN 201 or ECN 210, and MTH 122, or permission of instructor.

ECN 302 Intermediate Macroeconomics (4)
Construction, analysis and interpretation of models of aggregate economic behavior, including the policy implications of alternative models, international interrelationships, assessment of contemporary controversies in national policy and introduction to large econometric models.
Prerequisite: ECN 201 or ECN 210, and MTH 122, or permission of instructor.

ECN 309 Urban Economic Problems (4)
Survey of contemporary urban economic problems: location and migration patterns, local public services and public finance in politically fragmented metropolitan areas, urban poverty and crime, housing, blight and renewal, quality of life and transportation. Not open to students who have taken ECN 409.
Prerequisite: ECN 150 or ECN 201 or ECN 210.

ECN 310 Economics of the Environment (4)
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.
Prerequisite: ECN 150 or ECN 201 or ECN 210.

ECN 321 Money, Credit and the Economy (4)
The course focuses on three areas: an introduction to banking and financial institutions, study of the U.S. money and capital markets, and the study of money's impact on the nation's economy.
Prerequisite: ECN 150 or ECN 201 or ECN 210.

ECN 326 Economic Development (4)
Application of the tools of economic analysis to the problems of economic development and growth.
Prerequisite: ECN 150 or ECN 201 or ECN 210.

ECN 328 American Economic Development (4)
Models and case studies of selected events in the growth and development of the American economy, from colonial times to the present. Emphasizes the evolution of historical thought under the impact of economic analysis.
Prerequisite: ECN 150 or ECN 201 or ECN 210.

ECN 338 Economics of Human Resources (4)
Survey of the nature of labor markets, education and investment in human capital, unemployment, geographic and occupational mobility of labor, and effects of race, sex and age in labor markets.
Prerequisite: ECN 150 or ECN 201 or ECN 210.

ECN 341 The Soviet Economy (4)
The history of Soviet economic development; analysis of the principles of operation of the Soviet economy; the relationship between administrative structure and decision-making problems of resource allocation; evaluation of Soviet economic performance and economic reforms.
Prerequisite: ECN 150 or ECN 201 or ECN 210.

ECN 350 Comparative Economic Systems (4)
Comparative analysis of alternative forms of economic organization. The relationships between the economic system and resource allocation, pricing, income distribution and growth. Capitalism, market socialism and central planning are emphasized.
Prerequisite: ECN 201 or ECN 210 or permission of instructor.

ECN 373 International Trade and Finance (4)
An introduction to international trade and finance. Topics include the international economic and political systems, classical trade approaches, balance of payments, capital mobility, international money markets and banking, speculation, protectionism, income distribution, transfer of technology, regional blocs, economic warfare, trade and development, and the multinational firms. Not open to students who have taken ECN 473.
Prerequisite: ECN 201 or ECN 210 or permission of instructor.

ECN 378 Economic Anlysis of Law (4)
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.
Prerequisite: ECN 201 or ECN 210 or permission of instructor.

ECN 385 Industrial Organization (4)
The structure of American industry and the factors affecting it, with emphasis on economies of scale; barriers to entry; structure-behavior relationships, including pricing, product differentiation and technical change; evaluation of performance, antitrust and regulation.
Prerequisite: ECN 201 or ECN 210 or permission of instructor.

ECN 405 Econometrics (4)
Estimation and testing of economic models using regression techniques. Includes experience with computer "packages," analytical report writing and case studies. Topics include dealing with violations of regression assumptions, binary variables, autoregressive and distributed lag models and the structure of "large" simultaneous equations models.
Prerequisite: QMM 250 and ECN 301, or permission of instructor.

ECN 409 Urban Economics (4)
Survey of urban economics, location theory and migration patterns. Includes analysis of local public services and public finance, housing, quality of life, transportation and employment patterns. Not open to students who have taken ECN 309.
Prerequisite: QMM 250 and ECN 301, or permission of instructor.

ECN 414 Engineering Economics (2)
Financial accounting models, relevant costs, capital budgeting, present value, rate of return, payback, taxes, depreciation. Not open to business or economics majors.
Prerequisite: MTH 256 or APM 257.

ECN 418 Seminar in Economic Policy (4)
Analysis of economic policy. Topics vary but may include resource allocation, macroeconomic stability, economic growth, energy, public choice, global economic interdependence and the environment.
Prerequisite: ECN 301 and QMM 250, or permission of instructor.

ECN 456 Public Finance (4)
The role and impact of the public sector in a market economy. Includes expenditure determination, the basis of taxation in terms of equity, efficiency and flexibility, timing of cash flows, revenue source analysis, financing public debt and discussion of current problems.
Prerequisite: QMM 250 and ECN 301, or permission of instructor.

ECN 467 Economics of Health Care (4)
Application of the 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.
Prerequisite: QMM 250 and ECN 301, or permission of instructor.

ECN 468 Labor Economics (4)
Economic analysis of the functioning of labor markets, with emphasis on investment in human capital, the role of education, unemployment, labor market differentiation by race, sex and age, the geographic and occupational mobility of labor, and the inflation/unemployment trade-off.
Prerequisite: QMM 250 and ECN 301, or permission of instructor.

ECN 473 Theory of International Trade and Finance (4)
An intensive approach to international specialization and the open economy. Topics include modern developments in trade models, trade and welfare, impacts of trade policies, open economy macroeconomics, balance-of-payments analysis, stability, the determination of exchange rates under different regimes.
Prerequisite: QMM 250 and ECN 301, or permission of instructor.

ECN 480 Seminar in Economic Theory (4)
Survey of topics in economic theory using mathematical models. Recommended for students planning graduate work in economics.
Prerequisite: QMM 250, ECN 301 and ECN 302, or permission of instructor.

ECN 490 Independent Study (2, 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.
Prerequisite: An overall grade point average of 3.00 or better, major standing and an approved contract prior to registration.

FINANCE

FIN 322 Managerial Finance I (4)
The basic elements of managerial finance. Topics include: capital budgeting techniques, financial structure and analysis, the cost of capital and working capital management.
Prerequisite: ECN 201, ACC 200, QMM 250 and major standing.

FIN 419 International Accounting and Financial Management (4)
The application of the tools of accounting and financial analysis to cases and the problems of firms that have operations in several countries.
Prerequisite: FIN 322, ECN 373 and major standing.

FIN 421 Investment Analysis (4)
Study of the aspects of security analysis and portfolio theory. Four areas are covered: investment management and the money and capital markets; the analytical procedures for appraising securities; portfolio analysis; and the assessment of capital market efficiency.
Prerequisite: FIN 322 and major standing.

FIN 422 Managerial Finance II (4)
The application of the tools of financial analysis to specific cases in the financial management of corporate businesses and nonprofit enterprises.
Prerequisite: FIN 322 and major standing.

FIN 490 Independent Study (2,4)
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.
Prerequisite: An overall grade point average of 3.00 or better, major standing and an approved contract prior to registration.

MANAGEMENT

MGT 423 Managing the Multinational Firm (4)
Analysis of the scope, structure and environment — legal, social, political and economic — of the multinational firm, with emphasis on management strategies of planning, marketing, location and finance across cultural and national boundaries.
Prerequisite: ECN 301 or ECN 373 and major standing.

MGT 424 Business Law (4)
The study of the legal framework in which business decisions are made and the types of economic conflict and political activity that have created this framework. Topics include contracts, antitrust legislation, conflict resolution and regulatory agencies.
Prerequisite: ECN 201 or ECN 210, major standing and senior standing.

MGT 433 Labor/Management Relations (4)
Analysis of management/employee relations in modern industry. Topics include factors influencing the supply and demand for labor, evolution and governance of trade unions, collective bargaining and public policy.
Prerequisite: ECN 201, ORG 331 and major standing.

MGT 435 Management Strategies and Policies (4)
Managerial problem perception and the application of economics, statistics, organizational behavior, accounting, finance, marketing and quantitative methods to the systematic analysis of case studies.
Prerequisite: Major standing, completion of core program and senior status.

MGT 468 Health Care Management (4)
Application of the management tools of economics, statistics, organizational behavior, marketing, finance and quantitative methods to the systematic analysis of the management of health care institutions.
Prerequisite: Completion of management core program, ECN 467 and major standing.

MGT 480 Seminar: Current Business Topics (4)
The analysis of topics of current interest in management. Outside faculty and managers will participate in the seminar as an integral part of the course.
Prerequisite: Completion of the management core and major standing.

MGT 490 Independent Study (2, 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.
Prerequisite: An overall grade point average of 3.00 or better, major standing and an approved contract prior to registration.

MANAGEMENT INFORMATION SYSTEMS

MIS 300 Management Information Systems (2)
Examination of information support systems from the perspective of the manager as a user. Survey of the behavioral, organizational and systems theory foundations; the systems development process; and the integration of data processing, decision support systems, office, automation and telecommunications..
Prerequisite CSE 125, QMM 250 and major standing.

MIS 316 Systems Analysis (4)
Theory and practice of designing information systems to meet user needs, including problem investigation and the analysis, design and implementation of systems. Topics include the systems development cycle, system modeling techniques, interface to data base management systems, monitoring and control, review and maintenance, and project management. Includes case studies.
Prerequisites: MIS 300, CSE 130, ECN 301 and major standing, or permission of instructor.

MIS 400 Analysis of Complex Systems (4)
Modeling, instrumentation and control of complex systems. Emphasizes design, implementation and testing of information and control systems in unstructured and realistic contexts. Includes specification, evaluation and selection of hardware and software systems, ranging from applications in microcomputers to mainframes.
Prerequisite: ECN 301, MIS 316 and major standing.

MIS 404 Data Base Management/Data Communication (4)
Examination of the technology, organization, use, economics and administration of data base management systems (DBMS) and data communication systems. Topics include the logical organization, implementation and capabilities of a DBMS; the technology, design, control and use of wide areas and local area networks. Includes exercises using dBASE II or R:base 5000 or equivalent.
Prerequisite: CSE 130, MIS 300 and major standing.

MIS 407 Computer Systems for Problem Solving (4)
An advanced communications and problem solving course in which students learn to specify and design systems for computers. Consists of field studies by teams of students leading to computerized solutions of real world problems.
Prerequisite: MIS 316, eight credits in higher-level programming languages and major standing.

MIS 436 Information Processing and Decision Making (4)
Examines the design and implementation of decision support systems from the viewpoint of behavioral and organizational theory. Includes a critical review of theory and case studies taken from recent MIS literature.
Prerequisite: MIS 300, ORG 331 and major standing.

MIS 444 Simulation in Management (4)
Computer simulation models using GPSS or an equivalent simulation language, plus simulation exercises using standard programming languages. Implications of models and sensitivity analysis for forecasting, planning and decision making in the management environment are explored.
Prerequisite: CSE 130, MIS 300 and major standing.

MIS 490 Independent Study (2, 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.
Prerequisite: An overall grade point average of 3.00 or better, major standing and an approved contract prior to registration.

MARKETING

MKT 302 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: ECN 210 or ECN 201.

MKT 353 Marketing Management (4)
A study of the overall marketing strategies pertaining to problems experienced in today's economy. Uses the case study method to analyze these problems.
Prerequisite: MKT 302 and major standing.

MKT 404 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: MKT 302 and major standing.

MKT 405 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: MKT 302, QMM 250 and major standing.

MKT 406 Promotional Strategy (4)
A study of the promotional tools of advertising, public relations, sales and sales promotion. Emphasis on identifying the factors that become the basis for promotional decisions.
Prerequisite: MKT 302 and major standing.

MKT 420 Distribution Channels Management (4)
Examination of the management of marketing channel relationships. Focuses on the characteristics and social, economic and political relationships among wholesalers, agents, retailers and the other agencies that comprise distribution channels.
Prerequisite: MKT 302 and major standing.

MKT 430 Sales Management/Sales Promotion (4)
Examination of the function of sales management. Emphasis on the role of analysis, decision making, strategy formation and the impact of the "suction" or pull strategy provided by sales promotion.
Prerequisite: MKT 302 and major standing.

MKT 450 International Marketing (4)
The application of marketing principles to problems associated with marketing products and services to different nations. Cases in international marketing will be analyzed.
Prerequisite: MKT 302, ECN 373 and major standing.

MKT 480 Seminar in Marketing (4)
Study of a selected topic or current marketing interest relevant to marketing management. Topics may include industrial marketing, retail management or any area not covered by a specific course.
Prerequisite: MKT 302 and major standing.

MKT 490 Independent Study (2,4)
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.
Prerequisite: An overall grade point average of 3.00 or better, major standing and an approved contract prior to registration.

ORGANIZATIONAL BEHAVIOR

ORG 330 Introduction to Organizational Behavior (4)
The theoretical and empirical issues surrounding organizational management as it relates to individual and organizational processes; including perception, learning, motivation, communication, decision making, leadership, power and authority.
Prerequisite: Junior standing; QMM 250 recommended.

ORG 331 Organizational Behavior Applied to Management (4)
Examination of the theoretical and applied issues relevant to managing organizations, with an emphasis on the organizational topics of structure, planning, management information, control and decision making. Heavy emphasis is placed on managerial problem solving. A project analyzing and making recommendations for a real organization is required.
Prerequisite: ORG 330 and major standing.

ORG 334 Human Development in Organizations (4)
Examination of the organizational behavior field for non-business majors. Topics include human resources management, as well as applications of organizational behavior theory. For non-business majors only: Business majors should take ORG 434.
Prerequisite: Junior standing.

ORG 430 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.
Prerequisite: ORG 331, QMM 250 and major standing.

ORG 431 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: ORG 331 and major standing.

ORG 432 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: ORG 331 and major standing.

ORG 434 Management of Human Resources (4)
Exploration and analysis of the role of the personnel function in modern organizations. Topics include job analysis, manpower planning, recruitment, selection and placement, performance analysis and appraisal, compensation policies and practices, employee information systems and personnel research techniques.
Prerequisite: ORG 331, QMM 250 and major standing.

ORG 480 Topics in Organizational Management (4)
Intensive study of a selected topic relevant to organizational behavior and/or human resource management. Topics will vary from term to term and may include career development, compensation, men and women at work, industrial health and safety, management across cultures and power in organizations. May be repeated for credit.
Prerequisite: ORG 331 and major standing.

ORG 490 Independent Study (2, 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.
Prerequisite: An overall grade point average of 3.00 or better, major standing and an approved contract prior to registration.

QUANTITATIVE METHODS

QMM 250 Statistical Methods (6)
Statistical techniques useful in management and economic analysis. Emphasis on statistical description, hypothesis testing, statistical quality control, time series analysis, ANOVA, estimation and regression techniques. Includes extensive computer exercises.
Prerequisites: MTH 122 or MTH 154, and CSE 125 or CSE 130.

QMM 343 Operations Management (4)
Analysis of problems and case studies in production management in general manufacturing and service industries. Management science methods will be used to solve problems of inventory management, material requirements planning, acceptance sampling, quality control, capacity planning, facility location and operations scheduling. Includes computer exercises.
Prerequisite: QMM 250, ECN 301 and major standing.

QMM 440 Management Science (4)
Overview of models and applications of management science. Includes acceptance sampling, statistical quality control, decision analysis, Bayesian analysis, inventory models, PERT and CPM, queueing models, simulation and linear programming. Includes computer exercises.
Prerequisite: QMM 250, ECN 301 and major standing.

QMM 448 Project Management Techniques (4)
An examination of the various math-based techniques for managing projects. The topics include Program Evaluation Review Technique (PERT) and Critical Path Method (CPM). Includes computer exercises.
Prerequisites: MTH 122 and major standing.

QMM 452 Forecasting (4)
Survey of analytical forecasting methods. Also covers simple econometric and distributed-lag models, seasonality, autocorrelation, qualitative methods and the assessment of commercial forecasting services. Extensive use of computer "packages" to prepare written and oral forecasts based on real data.
Prerequisite: QMM 250 and major standing, or permission of instructor.

QMM 490 Independent Study (2, 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.
Prerequisite: An overall grade point average of 3.00 or better, major standing and an approved contract prior to registration.

SCHOOL OF ENGINEERING AND COMPUTER SCIENCE

Acting Dean: *John J. Metzner*

Office of the Dean: *Nan K. Loh, associate dean for graduate studies and research; Bhushan L. Bhatt, acting associate dean for administration; Lisa M. Birkby, assistant to the dean; Gail Innis, academic adviser/program coordinator; Frederick J. Lutz, engineering cooperative education coordinator*

General Information

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

Through its engineering programs, the School of Engineering and Computer Science 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 School of Engineering and Computer Science 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 hardware as well as the software 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, computer architecture, computer graphics, pattern recognition and scientific computation.

By selecting appropriate concentrations and minors, students can combine their studies in engineering and/or computer science with advanced preparation in a number of related fields.

The School of Engineering and Computer Science also offers a minor in computer science for nonmajors.

The Master of Science and Doctor of Philosophy Degrees

The School of Engineering and Computer Science offers programs leading to the Master of Science degree in electrical and computer engineering, mechanical engineering, systems and industrial engineering, computer and information science, and the Doctor of Philosophy degree in systems engineering. In addition, a Master of Science program in engineering management is offered in cooperation with the School of Business Administration.

For more information, see the *Oakland University Graduate Catalog.*

Center for Robotics and Advanced Automation

The School of Engineering and Computer Science has a Center for Robotics and Advanced Automation. Founded in 1981, it has since become a center of research excellence. The main goals of the center are to contribute to the demand for high technology and industrial productivity in the United States and to create a partnership among industries, government and academic communities to solve problems of common interest, particularly in intelligent robotics, intelligent machine vision and automated manufacturing.

Cooperative Education

Students in the School of Engineering and Computer Science who want to combine relevant work experience with their college educations are encouraged to participate in the university's cooperative education program. Co-op employment provides practical training that is related to a student's field of study and forms an integral part of the educational program. It enables students to relate their academic studies with practical applications; and it gives them early contact with practitioners in their fields.

Beginning in the junior year, co-op students alternate four-month semesters of full-time study with equal periods of paid, full-time employment in business, industry or government. The program coordinator and the employer work together to ensure that the practical training becomes progressively more challenging and carries increasingly greater responsibility as students advance through the curriculum.

Accreditation

All academic programs of Oakland University are accredited by the North Central Association of Colleges and Schools. In addition, the university's undergraduate programs in computer, electrical, mechanical and systems engineering have been fully accredited by the Accreditation Board for Engineering and Technology (ABET), the professional accrediting agency for engineering programs in the United States.

Preparation for Admission

Entering freshmen planning to major in engineering or computer science should have taken at least three years of high school mathematics, including trigonometry. A solid background in English composition is essential for all majors. Additional preparation should include course work in chemistry and physics. Drafting and machine shop practice courses are useful, but not necessary. Normally, a B average is required for admission to programs in the School of Engineering and Computer Science.

A student 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 college physics using calculus; 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 program prescribed by the Michigan Engineering College/Community College Liaison Committee. Brochures describing the program are available from community colleges or the School of Engineering and Computer Science. Generally, community college students with associate degrees have satisified the general education requirements of Oakland University's School of Engineering and Computer Science.

Students planning to transfer into the computer science program should complete one year of course work in calculus and one course in linear algebra and two semester courses in introductory college physics using calculus. A course in programming in a high-level language, such as PASCAL or PL/1, and a course in assembly programming are desirable. Whenever possible, further course work in computer science should be planned with an Oakland University adviser to ensure compatibility with university requirements.

Academic Policies of the School of Engineering and Computer Science

Transfer policy

The programs offered by the School of Engineering and Computer Science 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 background into advanced analysis and design work.

To ensure the integrity of its programs, the School of Engineering and Computer Science 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. Once matriculated at Oakland, students are expected to complete all remaining course work for the degree at Oakland University. Students who plan to take courses at other universities must have prior written consent of the chair of the student's major. Students who have completed 62 semester hours of credit from any accredited institution, including Oakland University, may not transfer additional credits or course equivalents from community or junior colleges.

Internal transfer

Oakland University students seeking admission to the School of Engineering and Computer Science from other programs will be considered after they have completed the following courses: MTH 154, MTH 155, PHY 151 and PHY 152. Normally an overall grade point average of 3.00 and good performance in the above courses are required for internal transfer.

Academic advising and plans of study

Each student of the School of Engineering and Computer Science is assigned a faculty adviser who helps the student plan a program of study that is academically and professionally sound. Students are encouraged to consult their faculty advisers in the selection of majors, minors or the choice of elective professional subjects.

In addition, the school's academic advising office (159A Dodge Hall) oversees specific program requirements. Students who have questions about transfer credit, academic standing, major standing, petitions or the details of degree requirements should consult the academic advising office.

Engineering and computer science majors are encouraged to complete a Plan of Study form, which is a timetable of courses to be taken for undergraduate credit. Students should complete the form in consultation with their advisers; the plan of study must be approved by the chair of the selected major.

The form should be submitted no later than the end of the semester in which a student completes 48 credits. Transfer students should submit the form when they enter Oakland University, regardless of the number of credits they have already earned.

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.

Course load

Students should strike a balance between their course load and other commitments. In general, students carrying a full load of 16 credits per semester should not be employed for more than 20 hours per week. Students who are employed 40 hours per week generally should not carry a course load of more than 4 credits per semester.

The university's maximum course load policy is detailed on page 30.

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 2.00 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 2.00 in one or more of the three categories will be placed on provisional status.

While on provisional status, students must have their programs of study approved by the chair of their major. Students who fail to remove provisional conditions after one semester are generally ineligible to continue their programs. However, provisional status may be continued if a student is judged to be making substantial progress toward correcting the deficiency. (For part-time students, 12 consecutive credits of course work will be considered equivalent to one semester.)

Students on provisional 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.

The above rules were established by the committee on instruction 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 committee. Petitions may be submitted to the associate dean for administration or the academic adviser.

Unsatisfactory performance

Unsatisfactory (U) grades and grades less than 2.0 are considered substandard. A student within the School of Engineering and Computer Science who repeats a course in which a grade below 2.0 has been earned must repeat that course at Oakland University. Courses in which a grade below 2.0 has been earned may not be subsequently passed by competency examination or independent study.

Prerequisites

In planning their schedules, students should ensure that they satisfy prerequisite and corequisite conditions for courses. Students will have their registrations cancelled if they register for courses for which they do not meet the conditions. Students will be liable for any financial penalties incurred by such cancellation.

Independent study and project courses

Independent study and project courses numbered 490 and 494 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 course work.

To register for an independent study or project course, a student must first submit a plan of work to the faculty member who will supervise the course. The plan must be approved by the faculty member and the chair of the major before a student may register for the course.

Application forms are available in the advising office, 159A Dodge Hall.

Requirements of the cooperative education program

Students interested in the cooperative education program in engineering or computer science should apply through the Office of the Cooperative Education Coordinator, 248 Dodge Hall.

To be admitted, a student must:

1. Be granted major standing in engineering or computer science (see page 223), or file an approved plan for achieving major standing, signed by the chair of the major. In addition, engineering students must have completed the mathematics sequence appropriate to their major.
2. Normally, have a cumulative grade point average of at least 2.80.
3. Have the approval of the School of Engineering and Computer Science, the cooperative education coordinator for the school and the employer.

Transfer students must have completed at least one semester of full-time study at Oakland University before acceptance into the program.

To remain in good standing in the cooperative education program, students must:

1. Complete alternate semesters of full-time study and full-time work.
2. Complete at least 12 credits of work appropriate to their elected major during each semester of study, maintaining a cumulative grade point average of at least 2.80.
3. Complete EGR 391 during the semester following each co-op assignment.
4. Submit a satisfactory training report (as part of the requirements for EGR 391) within four weeks of the beginning of the semester following each co-op assignment.
5. Receive a satisfactory employer evaluation for each assignment.

The grade assigned in EGR 391 will give added weight to the employer's evaluation, the student's written training report, a progress interview with the coordinator and the student's participation in regularly scheduled classes.

Students who do not meet the conditions for good standing will be subject to dismissal from the co-op program.

The co-op program is administered by the Department of Placement and Career Services.

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 in any course offered by the school, as determined by the university academic conduct committee, may be subject to penalties ranging from a reduced grade for the assignment, to a grade of 0.0 for the entire course, to academic probation, to 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.

For a detailed description of the university academic conduct policy, see the *Schedule of Classes*, the "Oakland University Student Handbook" or pages 32-33 of this catalog.

Petitions

Waivers of specific academic requirements may be initiated by submitting a petition of exception, as described on page 30.

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 or to the associate dean for administration. Petitions will be processed according to established university procedures.

Degree Requirements and Regulations

General requirements for the degrees of Bachelor of Science in Engineering and Bachelor of Science

The following general requirements must be met by a student seeking a bachelor's degree in computer engineering, electrical engineering, mechanical engineering, systems engineering, engineering chemistry, engineering physics or computer science.

Each student must:

1. Complete at least 128 credits for all engineering programs and at least 124 credits for the computer science program. At least 32 credits must be in courses at the 300-level or above.
2. Complete at least 32 credits at Oakland University. (Refer to the transfer policy of the School of Engineering and Computer Science for further clarification.) The credits taken at Oakland must include the following for students majoring in:
   a) computer, electrical, mechanical or systems engineering, at least 24 credits in engineering core or professional subjects required for the major;
   b) engineering chemistry and engineering physics, at least 16 credits in required engineering courses, and 16 credits in chemistry or physics courses required for the major;
   c) computer science, at least 20 credits in computer science courses required for the major.
3. Take, at Oakland University, the last 8 credits needed to complete baccalaureate requirements.
4. Demonstrate writing proficiency by meeting the university standard in English composition (see page 25).
5. Fulfill the university general education requirement (see pages 25-28).
6. Be admitted to major standing in the major of the student's choice.
7. Complete the requirements specified for the elected major.
8. Earn a cumulative grade point average of at least 2.00 in courses taken at Oakland University.
9. Complete an Application for Degree card at the Office of the Registrar and pay the graduation service fee.
10. Be in substantial compliance with all legal curricular requirements.

Graduation check

To ensure they have met all requirements, students are encouraged to participate in a final program audit the semester preceding the one in which they expect to graduate. Application may be made in the advising office, 159A Dodge Hall.

Suggested sequence for the freshman year

Following is an example of a suggested sequence of courses for freshmen entering the School of Engineering and Computer Science with the necessary preparation.

Engineering majors

First semester: EGR 101, MTH 154, CHM 144 or CHM 164, CSE 132, English composition or general education course. Second semester: CSE 171, MTH 155, PHY 151, general education course.

Computer science majors

First semester: CSE 132, MTH 154, English composition or general education course. Second semester: CSE 262, MTH 155, PHY 151, general education course. Computer science majors are encouraged to take the 1-credit course EGR 101 as a free elective.

Scheduling for subsequent years depends on students' selected majors or minors, but should be tailored to promptly meet requirements for admission to major standing. For sample schedules, refer to the department listings or to the student handbook of the School of Engineering and Computer Science.

Students who are not prepared to enter these mathematics and science courses without additional preparation in the subject areas must modify their schedules accordingly. Such students

may require additional time to complete degree requirements, unless they correct the deficiencies by enrolling during the spring and summer sessions following the freshman year.

Admission to major standing

To enroll in 300- or 400-level courses and to become candidates for the baccalaureate degree, students of the School of Engineering and Computer Science must gain major standing in their selected majors. An application for major standing should be submitted during the semester in which a student completes all requirements for admission.

Students lacking major standing may enroll in 300- or 400-level engineering or computer science courses only by presenting at registration an approval form signed by either the academic adviser or the chair of the major. The purpose of this process is to ensure that the student can correct and is working to correct outstanding deficiencies preventing admission to major standing. Forms may be obtained in the academic advising office, 159A Dodge Hall.

Admission to major standing in each of the programs of the School of Engineering and Computer Science requires certification in English composition, and satisfactory completion of course work in mathematics, science and the major, as designated below.

Computer science and computer engineering

Mathematics: MTH 154-155, MTH 256, APM 263. Science: PHY 151, PHY 152. Major: EGR 101 (for computer engineering majors only) CSE 132, CSE 171, CSE 262, CSE 280.

Electrical engineering and systems engineering

Mathematics: MTH 154-155, MTH 256, APM 257. Science: CHM 144 or CHM 164, PHY 151, PHY 152. Major: EGR 101, CSE 132, CSE 171 and ME 221.

Mechanical engineering

Mathematics: MTH 154-155 and either MTH 254 or both MTH 256 and APM 257. Science: CHM 144 or CHM 164, PHY 151, PHY 152. Major: EGR 101, CSE 132, CSE 171, ME 221.

Engineering physics

Mathematics: MTH 154-155, MTH 254. Science: CHM 144-145 or CHM 164-165, PHY 151, PHY 152, PHY 158. Major: EGR 101, CSE 132, CSE 171, EE 222.

Engineering chemistry

Mathematics: MTH 154-155, MTH 254. Science: CHM 144-145 or CHM 164-165, CHM 149, APM 257. Major: EGR 101, CSE 132, CSE 171, ME 221.

To satisfactorily complete the requirements for major standing a student must a) have an average of at least 2.00 in each of the mathematics, science and major course groupings; b) have no more than two grades below 2.0 in the required courses; c) not have repeated any course more than twice; and d) not have repeated more than three different courses. Courses in which a W (withdrawal) grade is recorded will not be counted.

Transfer students may satisfy the requirements for major standing by using transfer credits.

Double major

To earn two majors in engineering or in engineering and computer science, students must complete all 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 requirements on page 29.

Approved science electives

Approved science electives for majors in computer science and in computer, electrical, mechanical and systems engineering are: biology courses numbered 190 and higher; CHM 145, CHM 165 (CHM 144 for computer science majors) and chemistry courses numbered 225 and higher, except CHM 497; physics courses numbered 317 and higher, except PHY 341; and ENV 308 and ENV 373. Special topics and independent study courses require prior approval.

Free electives ineligible for credit toward the degree

Students entering the School of Engineering and Computer Science are expected to have adequate preparation for the required introductory courses in mathematics, physics and chemistry. Courses in these areas that are more elementary than MTH 154, PHY 151 and CHM 144 may not be presented for credit toward a degree in engineering and computer science. Specifically, the following courses and their equivalents are not recognized for credit toward the degree: MTH 100, MTH 111,* MTH 112,* MTH 121-122, MTH 141, PHY 101, PHY 102, CHM 104, CHM 110 and CHM 140.

New courses in mathematics, physics or chemistry that may be introduced in the future will be added to the list if the content warrants. A current list of disallowed courses is maintained in the office of the academic adviser, 159A Dodge Hall, and is available for inspection.

*See special information concerning these courses on page 97.

Concentrations and Minors

Students who wish to add an established minor or concentration or otherwise participate in an interdepartmental program must apply for admission and assistance in planning a program. Application may be made to the coordinator of the appropriate program committee or department involved.

Described below are the requirements for minors and concentrations that have been approved for engineering and computer science majors. Students planning medical, dental or optometry careers are advised to take the concentration in preprofessional studies in medicine, dentistry and optometry (see page 184).

Accounting

Coordinator: *David D. Sidaway*

For computer science majors, 20 credits. To obtain a minor in accounting, a student must complete the following courses with a grade of at least 2.0 in each course: ACC 200, ACC 210 and 12 additional credits in accounting (ACC) courses for which the student has the prerequisites.

Applied mathematics

Coordinator: *Jerrold W. Grossman*

For engineering and computer science majors, 22 credits. To obtain a minor in applied mathematics, a student must complete the following courses with a grade of 2.0 or better in each: MTH 254, MTH 256, APM 331, STA 226 or another approved statistics course, and two courses chosen from APM 257, APM 263 and courses labeled MTH, APM, STA or MOR with a number of 300 or higher (with the exception of MTH 414 and MTH 497). Students should consult an adviser in the Department of Mathematical Sciences when planning their programs.

Applied statistics

Coordinator: *Harvey Arnold*

For engineering and computer science majors, 16 credits. To obtain a concentration in applied statistics, a student must complete at least 16 credits in statistics with an average grade of at least 2.0. Courses must include STA 226 or another approved introductory course, STA 322, STA 323 and STA 324. Students should consult an adviser in the Department of Mathematical Sciences when planning their programs.

Biology

Coordinator: *Nalin J. Unakar*

For computer science majors, 20 credits. To obtain a liberal arts minor in biology, a student must take a minimum of 20 credits in biology, including BIO 190, BIO 195 and BIO 200. At least 8 credits must be in courses numbered 300 or higher.

Chemistry

Coordinator: *Paul Tomboulian*

For computer science majors, 26 credits. To obtain a liberal arts minor in chemistry, a student must take CHM 144-145, CHM 149, CHM 225, CHM 203-204 or CHM 234-235 and CHM 342. This minor is also available for engineering majors, 24 credits. Engineering majors must complete the following courses with an average grade of 2.0 or better: CHM 144-145, CHM 149, CHM 203 or CHM 225, CHM 342, CHM 470 and CHM 471.

Economics

Coordinator: *Ronald L. Tracy*

For engineering and computer science majors, 18-20 credits. To obtain a minor in economics (offered by the School of Business Administration), a student must complete the following courses with a grade of at least 2.0 in each course: ECN 150 or ECN 210 or ECN 200-201, and 12-16 additional credits in economics (ECN) courses for which the student has the prerequisites. Students who have taken ECN 150 need 16 additional credits to earn a minor.

Environmental studies

Coordinator: *Paul Tomboulian*

For engineering majors, 24 credits. To obtain a concentration in environmental studies, a student must complete the following courses: a) CHM 203, ENV 308 and EGR 407; b) 8 credits of electives chosen from ENV 362, ENV 372, ENV 373, ENV 481 and BIO 301; and c) 4 credits of EGR 490 or EGR 494 on an approved environmental engineering topic.

Finance

Coordinator: *Karl D. Gregory*

For computer science majors, 22 credits. To obtain a minor in finance, a student must complete the following courses and any prerequisites required: ACC 200, QMM 250, FIN 322 and 8 additional credits in finance (FIN) courses. A grade of at least 2.0 in each course is required.

Linguistics

Coordinator: *William Schwab*

For computer science majors, 20 credits. To obtain a liberal arts minor in linguistics, a student must complete the following courses with an average grade of at least 2.0: ALS 176 or one 200-level LIN course, LIN 301, and at least 12 linguistics (LIN) credits at the 300 or 400 levels, 4 of which must be at the 400 level.

Management

Coordinator: *Scott A. Monroe*

For engineering and computer science majors, 22-24 credits. To obtain a minor in management, a student must complete the following courses with a grade of at least 2.0 in each course: ECN 210 or ECN 200-201, ACC 200, ORG 330, and 8 additional credits chosen from 300- or 400-level courses in ACC, FIN, MGT, MIS, MKT, ORG or QMM for which the student has met the prerequisites.

Physics

Coordinator: *Norman Tepley*

For computer science majors, 20 credits. To obtain a liberal arts minor in physics, a student must complete the following courses with an average grade of at least 2.0: PHY 151-152, PHY 158, and at least 10 credits in physics courses numbered 300 or higher.

Quantitative methods

Coordinator: *David P. Doane*

For computer science majors, 17-18 credits. To obtain a minor in quantitative methods, a student must complete the following courses with a grade of at least 2.0 in each course: QMM 250, STA 226 or SYS 317; 8 additional credits chosen from QMM 343, QMM 440, QMM 448, QMM 452, ECN 405, STA 323 and STA 324.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Acting chair: *Richard E. Haskell*

Professors: *David E. Boddy, Richard E. Haskell, Glenn A. Jackson, Janusz W. Laski, Thomas G. Windeknecht*

Associate professors: *Subramanian Ganesan, Ronald J. Srodawa, Sarma R. Vishnubhotla*

Assistant professors: *Frank A. Cioch, Syed M. Mahmud, Fatma Mili, Christian C. Wagner*

Special instructor: *Jerry E. Marsh*

Adjunct professor: *Michael Marcotty*

Adjunct associate professor: *Osman D. Altan*

Major in Computer Engineering

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. 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.

To earn the Bachelor of Science degree with a major in computer engineering, students must complete 128 credits. They must demonstrate proficiency in writing (see page 25) and meet the following requirements:

		Credits
General education (excluding mathematics and science):		24
Mathematics and science:		
MTH 154-155	Calculus	8
MTH 256	Introduction to Linear Algebra	3
APM 257	Introduction to Differential Equations	3
APM 263	Discrete Mathematics	4
CHM 144	General Chemistry	4
PHY 151-152	Introductory Physics	8
Approved science elective		4
		34
Computer science and engineering core:		
CSE 132	Introduction to Computer Science	4
CSE 171	Introduction to Digital Logic and Microprocessors	4
CSE 262	Data Structures	4
CSE 280	Computer Organization and Assembly Language Programming	4
		16

Engineering core:		
EGR 101	Introduction to Engineering	1
EGR 401	Professional Engineering	1
EE 222	Introduction to Electrical Circuits	4
EE 384	Electronic Materials and Devices	4
ME 221	Statics and Dynamics	4
ME 241	Thermodynamics	4
SYS 317	Engineering Probability and Statistics	3
SYS 325	Lumped Parameter Linear Systems	3
		24
Professional subjects:		
Required		
EE 326	Electronic Circuit Design	4
CSE 388	Computer Hardware Design	4
CSE 464	Computer Organization and Architecture	4
		12
Electives — 12 credits chosen from:		
CSE 343	Foundations of Computer Science (4)	
Any 400-level CSE course (4-12)		
EE 426	Advanced Electronics (4)	
EE 437	Introduction to Communication Systems (4)	
SYS 422	Intelligent Robotics (4)	
SYS 431	Automatic Control Systems (4)	
SYS 463	Foundations of Computer-Aided Design (4)	
SYS 469	Simulation in Engineering (4)	
ECN 414	Engineering Economics (2)	
EGR 490*	Senior Project (2-4)	
EGR 494*	Independent Study (2-4)	
		12
Free electives (may be used to satisfy writing proficiency):		6
For limitations on free electives see page 224.		
	Total	128

**Needs prior permission of the chairperson of the Department of Computer Science and Engineering.*

Economics requirement:

The economics requirement may be met by completion of ECN 414 as a professional elective or by completion of ECN 150, ECN 200 or ECN 210 as a part of the general education requirement.

Performance requirements:

In addition to the previously stated requirements, satisfactory completion of the program requires an average grade of at least 2.0 within each group: namely, mathematics and science, core subjects and professional subjects. Within professional subjects, at most two grades below 2.0 are permitted, at most two different courses may be repeated, and a total of three repeat attempts is 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: EGR 101, MTH 154, CHM 144, CSE 132, English composition or general education, 17 credits; winter semester: MTH 155, PHY 151, CSE 171, general education, 1-credit free elective, 17 credits.

Sophomore year — fall semester: MTH 256, PHY 152, CSE 262, general education, 1-credit free elective, 16 credits; winter semester: APM 263, EE 222, CSE 280, general education, 16 credits.

Junior year — fall semester: APM 257, ME 221, SYS 317, EE 326, general education, 18 credits; winter semester: ME 241, CSE 388, SYS 325, general education, 15 credits.

Senior year — fall semester: EE 384, CSE 464, professional elective, science elective, 16 credits; winter semester: two professional electives, EGR 401, 4-credit free elective, 13 credits.

Major in Computer Science

The program in computer science leading to a Bachelor of Science degree prepares students for professional practice in systems programming, software design and computer applications, or for graduate study in computer science. The program provides a solid foundation based on the organization, processing and display of information. Through choice of minor, students may broaden their areas of expertise to include such diverse subjects as applied mathematics, business applications, management science or other areas that utilize computers in everyday operations.

To earn the Bachelor of Science degree with a major in computer science, students must complete 124 credits, demonstrate writing proficiency (see page 25) and meet the following requirements:

		Credits
General education (excluding mathematics and science):		24
Mathematics and science:		
MTH 154-155	Calculus	8
MTH 256	Introduction to Linear Algebra	3
APM 263	Discrete Mathematics	4
STA 226	Applied Statistics (or approved substitute)	4
PHY 151-152	Introductory Physics	8
PHY 158	General Physics Laboratory	2
Approved science elective		4
		33
Computer science and engineering core:		
CSE 132	Introduction to Computer Science	4
CSE 171	Introduction to Digital Logic and Microprocessors	4
CSE 262	Data Structures	4
CSE 280	Computer Organization and Assembly Language Programming	4
		16
Professional subjects:		
Required:		
Three programming language laboratories from groups B and C (see page 243) with at least one from Group B and one from Group C		3
CSE 335	Programming Languages	4
CSE 343	Foundations of Computer Science	4
CSE 450	Operating Systems	4
		15
Electives — 12 credits chosen from:		
Any 300- or 400-level CSE course (4-12)		
SYS 463	Foundations of Computer-Aided Design (4)	
SYS 469	Simulation in Engineering (4)	
EGR 490*	Senior Project (2-4)	
EGR 494*	Independent Study (2-4)	
		12
Approved minor:		20
Free electives (may be used to satisfy writing proficiency)		4
For limitations on free electives see page 224.		
	Total	124

**Needs prior approval of the chairperson of the Department of Computer Science and Engineering.*

Performance requirements:

In addition to previously stated requirements, satisfactory completion of the program requires an average grade of at least 2.0 within each group: namely, mathematics and science, core subjects, professional subjects and approved minor. Within professional subjects, at most two grades below 2.0 are permitted, at most two different courses may be repeated and a total of three repeat attempts is permitted.

Approved minors

Computer science students must complete an approved minor with an average grade point of at least 2.00. Approved minors are: accounting, applied mathematics, applied statistics, biology, chemistry, economics, finance, linguistics, management, physics and quantitative methods (see page 224).

Other minors or alternate programs may be approved by petition. Students must apply to the coordinator of the program for assistance in planning their minors and to obtain certification. Courses used to satisfy minor requirements may also be used to meet other program requirements.

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: MTH 154, CSE 132, general education, English composition or general education, 1-credit free elective, 17 credits; winter semester: MTH 155, PHY 151, CSE 262, general education, 16 credits.

Sophomore year — fall semester: MTH 256, PHY 152, PHY 158, CSE 171, programming lab, 14 credits; winter semester: APM 263, CSE 280, course in minor, general education, programming lab, 17 credits.

Junior year — fall semester: STA 226, CSE 335, course in minor, general education, programming lab, 17 credits; winter semester: CSE 343, course in minor, general education, free elective, 16 credits.

Senior year — fall semester: CSE 450, professional elective, course in minor, science elective, 16 credits; winter semester: two professional electives, course in minor, free elective, 15 credits.

Minor in computer science for nonengineering majors

The School of Engineering and Computer Science offers a minor in computer science to students with majors other than engineering or computer science.

Students must earn 20 credits in computer science (CSE) courses, including: a minimum of 8 credits taken from CSE 335, CSE 340, CSE 343, CSE 345 or any 400-level CSE course approved by an adviser; a maximum of 8 credits from CSE 125, CSE 130 and CSE 132; a maximum of 8 credits from CSE 220, CSE 248, CSE 280 and CSE 262; and a maximum of 4 credits in "Programming Language Labs." A grade point average of at least 2.00 is required in courses counted toward a minor.

Students seeking a minor must obtain permission from the Department of Computer Science and Engineering in order to register for CSE courses at the 300 and 400 levels.

DEPARTMENT OF ELECTRICAL AND SYSTEMS ENGINEERING

Acting chair: *Tung H. Weng*

John F. Dodge Professor: *Nan K. Loh*

Professors: *David H. Evans, Keith R. Kleckner, John J. Metzner, Tung H. Weng, Howard R. Witt*

Associate professor: *Andrzej Rusek*

Assistant professors: *Hoda S. Abdel-Aty-Zohdy, Ka C. Cheok, Manohar Das, Robert P. Judd, Robert P. Van Til, Mohamed A. Zohdy*

Visiting assistant professor: *You L. Gu*

Adjunct professors: *Donald R. Falkenburg, Reuben Hackam*

Adjunct associate professor: *Ronald R. Beck*

Major in Electrical Engineering

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 needed to function as electrical engineers in the coming decades. Students obtain solid grounding in the fundamentals of analog and digital circuits, electronics, electromagnetics and electronic devices. In addition, a strong laboratory component of the program offers numerous design opportunities and allows students to relate theoretical ideas to practical problems.

Electrical 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.

To earn the Bachelor of Science degree with a major in electrical engineering, students must complete 128 credits, demonstrate writing proficiency (see page 25) and meet the following requirements:

		Credits
General Education (excluding mathematics and science)		24
Mathematics and science:		
MTH 154-155	Calculus	8
MTH 254	Multivariable Calculus	4
MTH 256	Introduction to Linear Algebra	3
APM 257	Introduction to Differential Equations	3
CHM 144	General Chemistry	4
PHY 151-152	Introductory Physics	8
Approved science elective		4
		34
Engineering core:		
EGR 101	Introduction to Engineering	1
EGR 401	Professional Engineering	1
CSE 132	Introduction to Computer Science	4
CSE 171	Introduction to Digital Logic and Microprocessors	4
EE 222	Introduction to Electrical Circuits	4

EE 384	Electronic Materials and Devices	4
ME 221	Statics and Dynamics	4
ME 241	Thermodynamics	4
SYS 317	Engineering Probability and Statistics	3
SYS 325	Lumped Parameter Linear Systems	3
		32

Professional subjects:

Required:

EE 326	Electronic Circuit Design	4
EE 345	Electric and Magnetic Fields	4
EE 351	Electromechanical Energy Conversion	4
EE 378	Design of Digital Systems	4
EE 437	Introduction to Communication Electronics	4
SYS 431	Automatic Control Systems	4
		24

Electives — 8 credits chosen from:

Any 400 level course with an EE, CSE or SYS designation (4-8)

EGR 490*	Senior Project (2-4)	
EGR 494*	Independent Study (2-4)	
ME 454	Solar and Alternate Energy Systems (4)	
PHY 472	Quantum Mechanics I (4)	
ECN 414	Engineering Economics (2)	
		8

Free electives (may be used to satisfy writing proficiency): 6

For limitations on free electives, see page 224.

Total 128

**Needs prior approval of the chairperson of the Department of Electrical and Systems Engineering.*

Depth Areas

Electrical engineering students desiring depth in a particular area should consider the following professional elective pckages: Electronics — EE 426, EE 487; Control systems — SYS 422, SYS 433; Computers — EE 470, EE 472; Power systems — SYS 458, ME 454.

Economics Requirement

The economics requirement may be met by completion of ECN 414 as a professional elective or by completion of ECN 150, 200 or 210 as a part of the general education requirement.

Performance requirements:

In addition to previously stated requirements, satisfactory completion of the program requires an average grade of at least 2.0 within each required group: namely, mathematics and science, core subjects, and professional subjects. Within professional subjects, at most two grades below 2.0 are permitted, at most two different courses may be repeated and a total of three repeat attempts is permitted.

Major in Systems Engineering

Systems engineering is a broad discipline with roots in a diverse spectrum of engineering fields. The coordination of engineering tasks and the assembly of a complex array of subsystems, such as in the Apollo and Space Shuttle programs, are typical of the systems approach to problem solving and design.

Oakland University's systems engineering program contains two options: dynamic systems and control, and manufacturing.

The dynamic systems and control program prepares students for the field of control engineering. The curriculum combines courses from electrical and mechanical engineering, along with a systems engineering control sequence. It is designed to teach the fundamentals of mechanical systems, control system design techniques, and the practical matter of implementing the controllers in modern electronic hardware.

The manufacturing program emphasizes the important role of the computer in systems design. This curriculum is anchored by a strong computer science component which, along with professional courses, prepares a student for a career in simulation, computer-assisted design and systems optimization.

To earn the Bachelor of Science degree with a major in systems engineering, students must complete 128 credits, demonstrate writing proficiency (see page 25) and meet the following requirements:

		Credits
General education (excluding mathematics and science):		24
Mathematics and science		
MTH 154-155	Calculus	8
MTH 256	Introduction to Linear Algebra	3
APM 257	Introduction to Differential Equations	3
APM 263*	Discrete Mathematics (4) or	
MTH 254*	Multivariable Calculus (4)	4
CHM 144	General Chemistry	4
PHY 151-152	Introduction to Physics	8
Approved science elective		4
		34
Engineering core:		
EGR 101	Introduction to Engineering	1
EGR 372	Properties of Materials	4
EGR 401	Professional Engineering	1
CSE 132	Introduction to Computer Scienc	4
CSE 171	Introduction to Digital Logic and Microprocessors	4
EE 222	Introduction to Electrical Circuits	4
ME 221	Statics and Dynamics	4
ME 241	Thermodynamics	4
SYS 317	Engineering Probability and Statistics	3
SYS 325	Lumped Parameter Linear Systems	3
		32
Professional subjects for dynamic systems and control option (32 credits)		
Required:		
EE 326	Electronic Circuit Design	4
EE 351	Electromechanical Energy Conversion	4
EE 378	Design of Digital Systems	4
ME 321	Dynamics and Vibrations	4
SYS 431	Automatic Control Systems	4
SYS 433	Modern Control System Design	4
		24
Electives — 8 credits chosen from:		
Any 400-level course with EE, CSE, SYS or ME designation (4-8)		
EGR 490**	Senior Engineering Project (2-4)	
EGR 494**	Independent Study (2-4)	
ECN 414	Engineering Economics (2)	
		8
Professional subjects for manufacturing option (32 credits)		
Required:		
CSE 262	Data Structures	4
CSE 418	Applied Numerical Methods: Matrix Methods	4
SYS 410	Systems Optimization and Design	4
SYS 463	Foundations of Computer-Aided Design	4
SYS 469	Simulation in Engineering	4
SYS 483	Production Systems	4
		24

Electives — 8 credits chosen from:

Any 400-level course with the SYS, CSE, EE or ME designation (4-8)		
EGR 490**	Senior Project (2-4)	
EGR 494**	Independent Study (2-4)	
ECN 414	Engineering Economics (2)	
		8
Free Electives (may be used to satisfy writing proficiency)		6
For limitations, on free electives see page 224.		
	Total	128

**MTH 254 is required for dynamic systems and control option; and APM 263 is required for manufacturing option.*
***Needs prior permission of the chairperson of the Department of Electrical and Systems Engineering.*

Economics requirement:

The economics requirement may be met by completing ECN 414 as a professional elective or by completing ECN 150, ECN 200 or ECN 210 as part of the general education requirement.

Performance requirements:

In addition to previously stated requirements, satisfactory completion of the program requires an average grade of at least 2.0 within each group: namely mathematics and science, core subjects and professional subjects. Within professional subjects, at most two grades below 2.0 are permitted, at most two different courses may be repeated and a total of three repeat attempts is permitted.

Sample electrical engineering and systems engineering schedules

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: EGR 101, MTH 154, CHM 144, CSE 132, English composition or general education, 17 credits; winter semester: MTH 155, PHY 151, CSE 171, general education, 1-credit free elective, 17 credits.

Sophomore year — fall semester: MTH 254, PHY 152, ME 221 or ME 241, general education, 16 credits; winter semester: APM 257, EE 222, ME 221 or ME 241, general education, 1-credit free elective, 16 credits.

Junior year — fall semester: MTH 256, SYS 317, EGR 372 or EE 384, SYS 325, general education, 17 credits; winter semester: two professional subjects, one science elective, one free elective, 16 credits.

Senior year — fall semester: three professional subjects, EGR 401, 13 credits; winter semester: three professional subjects, general education, 16 credits.

DEPARTMENT OF MECHANICAL ENGINEERING

Chair: *Joseph D. Hovanesian*

Professors: *Robert H. Edgerton, William G. Hammerle, Joseph D. Hovanesian, Yau Y. Hung, Gilbert L. Wedekind*

Associate professor: *Bhushan L. Bhatt*

Assistant professors: *Ren-Jyh Gu, Chin L. Ko, Brian P. Sangeorzan*

Adjunct professors: *Martin A. Erickson, Joseph S. Rice*

Adjunct associate professor: *Steven L. Plee*

Adjunct assistant professor: *Ranjit K. Roy*

Major in Mechanical Engineering

The field of mechanical engineering offers a broad spectrum of career opportunities in such areas as design, analysis, test development, research and the manufacturing of numerous products.

Oakland University offers a program in mechanical engineering leading to a Bachelor of Science degree. The curriculum provides a foundation in the mechanics of solids, thermodynamics, fluid mechanics, transfer and rate mechanisms, materials, design of mechanical systems and electrical theory. A strong laboratory experience is interwoven through the curriculum. Opportunities are provided to allow students to relate theoretical ideas to practical problems.

The option of selecting several of the senior-level courses allows for greater flexibility in the choice of option areas of specialization within mechanical engineering.

To earn the Bachelor of Science degree with a major in mechanical engineering, students must complete 128 credits, demonstrate writing proficiency (see page 25) and meet the following requirements:

		Credits
General Education (excluding mathematics and science):		24
Mathematics and science:		
MTH 154-155	Calculus	8
MTH 254	Multivariable Calculus	4
MTH 256	Introduction to Linear Algebra	3
APM 257	Introduction to Differential Equations	3
CHM 144	General Chemistry	4
PHY 151-152	Introductory Physics	8
Approved science elective		4
		34
Engineering core:		
EGR 101	Introduction to Engineering	1
EGR 372	Properties of Materials	4
EGR 401	Professional Engineering	1
CSE 132	Introduction to Computer Science	4
CSE 171	Introduction to Digital Logic and Microprocessors	4
EE 222	Introduction to Electrical Circuits	4

ME 221	Statics and Dynamics	4
ME 241	Thermodynamics	4
SYS 317	Engineering Probability and Statistics	3
SYS 325	Lumped Parameter Linear Systems	3
		32

Professional subjects:

Required:

ME 321	Dynamics and Vibrations	4
ME 331	Introduction to Fluid and Thermal Energy Transport	4
ME 361	Mechanics of Materials	4
		12

Professional design requirements:

Choose one course from Group A and one from Group B:

Group A

ME 461	Analysis and Design of Mechanical Structures (4)
ME 486	Machine Design (4)
ME 487	Mechanical Engineering CAD/CAM Systems (4)

Group B

ME 454	Solar and Alternate Energy Systems (4)
ME 482	Fluid and Thermal Energy Systems (4)

8

Professional options:

1. General mechanical engineering option (12 credits)

Professional electives (chosen from the following if not taken to satisfy design requirements):

ME 438	Fluid Transport (4)
ME 448	Thermal Energy Transport (4)
ME 449	Numerical Techniques in Heat Transfer and Fluid Flow (4)
ME 454	Solar and Alternate Energy Systems (4)
ME 456	Energy Systems Analysis (4)
ME 461	Analysis and Design of Mechanical Structures (4)
ME 472	Material Properties and Processes (4)
ME 482	Fluid and Thermal Energy Systems (4)
ME 486	Machine Design (4)
ME 487	Mechanical Engineering CAD/CAM Systems (4)
ECN 414	Engineering Economics (2)

Not more than 4 credits from:

EGR 407	Environmental Engineering (4)
EGR 490*	Senior Engineering Project (2-4)
EGR 494*	Independent Study (2-4)
SYS 431	Automatic Control Systems (4)
SYS 469	Simulation in Engineering (4)
SYS 483	Production Systems (4)
CSE 417	Applied Numerical Methods: Approximations (4)
CSE 418	Applied Numerical Methods: Matrix Methods (4)

12

2. Fluid and thermal systems option (12 credits)

Required subject:

ME 482	Fluid and Thermal Energy Systems (4)

Professional electives (chosen from the following if not taken to satisfy design requirements):

ME 438	Fluid Transport (4)
ME 448	Thermal Energy Transport (4)
ME 449	Numerical Techniques in Heat Transfer and Fluid Flow (4)
ME 454	Solar and Alternate Energy Systems (4)
ME 456	Energy Systems Analysis (4)
EGR 490*	Senior Engineering Project (2-4)
ECN 414	Engineering Economics (2)

No more than 4 credits from

EGR 494*	Independent Study (2-4)	
SYS 431	Automatic Control Systems (4)	
CSE 417	Applied Numerical Methods: Approximations (4)	
CSE 418	Applied Numerical Methods: Matrix Methods (3)	
		12

3. Computer-aided design option (12 credits)

Required subjects:

ME 461	Analysis and Design of Mechanical Structures (4)	
ME 487	Mechanical Engineering CAD/CAM Systems (4)	

Professional electives (chosen from the following if not taken to satisfy design requirements):

ME 449	Numerical Techniques in Heat Transfer and Fluid Flow (4)	
ME 472	Material Properties and Processes (4)	
ME 486	Machine Design (4)	
EGR 490*	Senior Engineering Project (2 to 4)	
EGR 494*	Independent Study (2 to 4)	
ECN 414	Engineering Economics (2)	

No more than 4 credits from:

SYS 463	Foundations of Computer-Aided Design (4)	
CSE 417	Applied Numerical Methods: Approximations (4)	
CSE 418	Applied Numerical Methods: Matrix Methods (4)	
		12

4. Production and manufacturing processes option (12 credits):

Required subjects:

ME 472	Material Properties and Processes (4)	
ME 486	Machine Design (4)	

Professional electives (chosen from the following if not taken to satisfy design requirements):

ME 461	Analysis and Design of Mechanical Structures (4)	
ME 482	Fluid and Thermal Energy Systems (4)	
ME 487	Mechanical Engineering CAD/CAM Systems (4)	
ME 665	Experimental Stress Analysis (4) (requires instructor approval)	
EGR 490*	Senior Engineering Project (2-4)	
EGR 494*	Independent Study (2-4)	
SYS 422	Intelligent Robotics (4)	
SYS 483	Production Systems (4)	
ECN 414	Engineering Economics (2)	

No more than 4 credits from:

SYS 431	Automatic Control (4)	
CSE 470	Microprocessors and Microcomputers (4)	
		12

Free electives (may be used to satisfy writing proficiency and programming recommendations): 6

For limitations on free electives see page 224.

Total 128

**Needs prior permission of the chairperson of the Department of Mechanical Engineering.*

Economics requirement

The economics requirement may be met by completion of ECN 414 as a professional elective or by completion of ECN 150, ECN 200 or ECN 210 as part of the general education requirement.

Programming Recommendations

In addition to the required computer courses, it is recommended that students have some experience in Fortran language, such as CSE 232, and word processing, spread sheets and simple graphics such as CSE 201.

Performance Requirements

In addition to previously stated requirements, satisfactory completion of the program requires an average grade of at least 2.0 within each group: namely, mathematics and science, core subjects, and professional subjects. Within professional subjects, at most two grades below 2.0 are permitted, at most two different courses may be repeated and a total of three repeat attempts is 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: EGR 101, MTH 154, CHM 144, CSE 132, English composition or general education, 17 credits; winter semester: MTH 155, PHY 151, CSE 171, general education, 1-credit free elective, 17 credits.

Sophomore year — fall semester: MTH 254, PHY 152, ME 221 or ME 241, general education, 16 credits; winter semester: APM 257, EE 222, ME 221 or ME 241, general education, 1-credit free elective, 16 credits.

Junior year — fall semester: MTH 256, ME 331, EGR 372, general education, 15 credits; winter semester: SYS 325, ME 321, ME 361, science elective, 15 credits.

Senior year — fall semester: SYS 317, EGR 401, two professional electives, general education, 16 credits; winter semester: three professional electives, free elective, 16 credits.

ENGINEERING SCIENCES PROGRAMS

Major in Engineering Chemistry

Coordinator: *Chin L. Ko*

The program in engineering chemistry, 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 provides for intensive study in chemistry, along with basic preparation in engineering.

To earn the Bachelor of Science degree with a major in engineering chemistry, students must complete 128 credits, demonstrate writing proficiency (see page 25) and meet the following requirements:

		Credits
General education (excluding mathematics and science):		24
Mathematics and physics:		
MTH 154-155	Calculus	8
MTH 254	Multivariable Calculus	4
APM 257	Introduction to Differential Equations	3
PHY 151-152	Introduction to Physics	8
		23
Chemistry:		
CHM 144-145	General Chemistry	8
CHM 149	Chemistry Laboratory	2
CHM 234-235	Organic Chemistry	8
CHM 237	Separations and Spectroscopy Laboratory	2
CHM 342-343	Physical Chemistry	8
CHM 348	Physical Chemistry Laboratory	2
CHM 471	Macromolecular Chemistry	3
Plus 6 credits from:		
CHM 462-463	Inorganic Chemistry (4)	
CHM 470	Industrial Chemistry (3)	
CHM 472	Macromolecular Chemistry II (3)	
CHM 477	Molecular Laboratory (2)	6
		39
Engineering:		
EGR 101	Introduction to Engineering	1
EGR 401	Professional Engineering	1
CSE 132	Introduction to Computer Science	4
CSE 171	Introduction to Digital Logic and Microprocessors	4
EE 222	Introduction to Electrical Circuits	4
ME 221	Statics and Dynamics	4
ME 241	Thermodynamics	4
ME 331	Introduction to Fluid and Thermal Energy Transport	4
SYS 325	Lumped Parameter Linear Systems	3
		29
Plus 8 credits from:		
ME 438	Fluid Transport (4)	
ME 448	Thermal Energy Transport (4)	
ME 449	Numerical Techniques in Heat Transfer and Fluid Flow (4)	
ME 456	Energy Systems Analysis (4)	

ME 482	Fluid and Thermal Energy Systems (4)	
SYS 431	Automatic Control Systems (4)	
		8
Free electives (may be used to satisfy writing proficiency):		5
For limitations, on free electives see page 224.		
	Total	128

Performance requirements

In addition to the previously stated requirements, satisfactory completion of the program requires an average grade of at least 2.0 in the courses taken to satisfy the engineering, chemistry and mathematics and physics requirements.

Major in Engineering Physics

Coordinator: *Hoda Abdel-Aty-Zohdy*

The program in engineering physics, offered jointly by the School of Engineering and Computer Science and the College of Arts and Sciences, leads to broad education in physics and mathematics, along with basic preparation in engineering.

To earn the Bachelor of Science degree with a major in engineering physics, students must complete 128 credits, demonstrate writing proficiency (see page 25), and meet the following requirements:

		Credits
General education (excluding mathematics and science)		24
Mathematics and science:		
MTH 154-155	Calculus	8
MTH 254	Multivariable Calculus	4
APM 257	Introduction to Differential Equations	3
CHM 144-145	General Chemistry	
or (CHM 164-165)		8
PHY 151-152	Introductory Physics	8
PHY 158	Physics Laboratory	2
PHY 317	Modern Physics Laboratory	2
*PHY 341	Electronics	
or (EE 326)		(4)
PHY 351	Intermediate Theoretical Physics	4
PHY 361	Mechanics I	4
PHY 371	Modern Physics	4
One of:		
PHY 331	Optics	
PHY 381	Electricity and Magnetism I	
PHY 472	Quantum Mechanics I	4
		51-55
Engineering:		
EGR 101	Introduction to Engineering	1
EGR 401	Professional Engineering	1
CSE 132	Introduction to Computer Science	4
CSE 171	Introduction to Digital Logic and Microprocessors	4
EE 222	Introduction to Electrical Circuits	4
EE 326 or	Electronic Circuit Design	
(PHY 341)		(4)
ME 241	Thermodynamics	4
SYS 317	Engineering Probability and Statistics	3
SYS 325	Lumped Parameter Linear Systems	3
Plus three 4-credit, 400-level engineering electives of the same designation, at least two of which must be chosen from the list of approved design electives.		12
		36-40

Technical electives (additional 7 to 8 credits chosen from the following):

MTH 256	Introduction to Linear Algebra (3)	
APM 263	Discrete Mathematics (4)	
PHY 318	Nuclear Physics Laboratory (2)	
PHY 331	Optics (4)	
PHY 372	Nuclear Physics (4)	
PHY 381	Electricity and Magnetism I (4)	
PHY 418	Modern Optics Laboratory (2)	
PHY 472	Quantum Mechanics I (4)	
PHY 482	Electricity and Magnetism II (4)	
EE 351	Electromechanical Energy Conversion (4)	
EE 384	Electronic Materials and Devices (4)	
ME 331	Introduction to Fluid and Thermal Energy Transport (4)	
ME 361	Mechanics of Materials (4)	
Any EGR, EE, ME or SYS 400-level courses (4-8)		7-8
Free electives (can be used to satisfy writing proficiency):		5-6
For limitations, on free electives see page 224.		
	Total	128

**Students taking PHY 341 who plan to take advanced EE courses should also take PHY 347. For these students, PHY 347 may be counted as part of the technical elective requirement.*

Approved design electives for engineering physics (Two courses are required as part of the engineering core of the degree program.):

EE 426	Advanced Electronics (4)
EE 437	Introduction to Communication Electronics (4)
EE 470	Microprocessors and Microcomputers (4)
EE 472	Microcomputer-Based Control Systems (4)
ME 454	Solar and Alternate Energy Systems (4)
ME 482	Fluid and Thermal Energy Systems (4)
ME 486	Machine Design (4)
ME 487	Mechanical Engineering CAD/CAM Systems (4)
SYS 410	Systems Optimization and Design (4)
SYS 483	Production Systems (4)

An approved EGR 490 or PHY 490 may count for one of the design electives.

Students should note that some approved design electives have prerequisites that are not automatically met by completion of the required courses in engineering. Thus, careful selection of technical electives is essential to preserve choice in later selection of design electives.

Performance requirements:

In addition to the previously stated requirements, satisfactory completion of the program requires an average grade of at least 2.0 in the engineering and computer science courses and also in the mathematics and science courses taken to meet program requirements.

Course Offerings

Courses offered through the School of Engineering and Computer Science carry the following designations: computer science and engineering courses, CSE; electrical engineering courses, EE; systems engineering courses, SYS; mechanical engineering courses, ME. Courses offered under the general title of engineering are listed under EGR.

To register for 300- and 400-level courses, students must have attained major standing.

ENGINEERING

EGR 101 Introduction to Engineering (1)

Introduction to the various disciplines of engineering. The course will be a series of weekly lectures on topics in engineering. (Graded S/U)

EGR 106 Machine Shop Practice (2)

Introduction to basic machining principles and machine shop techniques, uses of lathes, milling machines and other power machines. Emphasis is on practical experience.

EGR 108 Engineering Drawing (2)
Introduction to the use of drafting instruments and procedures. Geometric construction and projection, dimensioning, tolerancing and graphic symbols.

EGR 372 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.
Prerequisite: CHM 144, PHY 152 and major standing.

EGR 391 Cooperative Engineering and Computer Science (1)
A seminar course for cooperative engineering and computer science students to be taken in the semester following a cooperative training assignment. A report of the training assignment must be submitted within four weeks of the beginning of the course. May be repeated up to three times.
Prerequisite: Consent of the cooperative education coordinator.

EGR 400 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 401 Professional Engineering (1)
Seminars of professional interest to engineers, including such topics as professionalism, ethics, engineering law, engineering economics and technical communications. (Graded S/U)
Prerequisite: Senior status in engineering.

EGR 407 Environmental Engineering (4)
A design course that includes consideration of resources and recycling in terms of available energy; economic/thermodynamic combined situations are illustrated through field trips and by guest speakers. A group or individual project is required.
Prerequisite: ME 241.

EGR 490 Senior Project (2 to 4)
Independent work on advanced laboratory projects. Topic must be approved prior to registration. May be taken more than once.

EGR 494 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.

EGR 495 Special Topics (2 to 4)
Advanced study of special topics in engineering. May be taken more than once.

COMPUTER SCIENCE AND ENGINEERING

CSE 115 Natural and Artificial Languages (4)
A study of the similarities and differences among the languages of men, beasts and machines. Topics will include general characteristics of communication, human linguistic abilities, computer languages and human/computer interfaces. Identical to LIN 115. *Satisfies the university general education requirement in mathematics, logic and computer science.*

CSE 125 Introduction to Computer Use (4)
A first course in computer usage for non-engineering and computer science majors. The principal objective is to introduce the student to computer hardware, software and business applications. Topics include word processing, spreadsheets, data base management, data communications and graphics software. Programming concepts in data base languages. Problem solving methodology is emphasized. Instruction is divided evenly between lecture and computing laboratory. *Satisfies the university general education requirement in mathematics, logic and computer science.*
Prerequisite: MTH 112* or equivalent.

CSE 130 Introduction to Computer Programming (4)
Introduction to digital computers and algorithmic programming in a language such as PASCAL. Topics covered include data storage and manipulation, control structures and subprogramming. Engineering and computer science majors should enroll in CSE 132. Offered every semester. *Satisfies the university general education requirement in mathematics, logic and computer science.*
Prerequisite: MTH 112* or equivalent.

*See special information concerning this course on page 97.

CSE 132 Introduction to Computer Science (4)
Introduction to an algorithmic language such as PASCAL, numerical methods, and data structures including stacks, queues, linked lists and trees. Emphasis is on applications in engineering and computer science.
Corequisite: MTH 154.

CSE 171 Introduction to Digital Logic and Microprocessors (4)
Introduction to digital logic and microprocessors. Machine language programming of microprocessors. Use of microcomputers for laboratory data acquisition and analysis.
Prerequisite: CSE 132 and MTH 154.

CSE 201 Engineering Computer Use (1)
Microcomputer software of use to engineering and computer science students. Word processing, spreadsheets, data base management, data communications and graphics. Students cannot receive credit for both CSE 201 and CSE 125.

CSE 220 Computer-based Information Systems I (4)
Introduction to business data processing using the COBOL programming language. Emphasis is on structured programming and top-down development in an interactive environment.
Prerequisite: Ability to program in at least one high level language.

CSE 221 Computer-based Information Systems II (4)
Continuation of CSE 220. Advanced capabilities of the COBOL language are studied. Topics include report writer, relative, direct and indexed files, data dictionaries, debugging. Sophisticated business data processing systems will be programmed. Credit applies to graduation but not the major.
Prerequisite: CSE 220 or equivalent.

CSE 230-245 Programming Language Labs.
Group A:
CSE 230 Language Laboratory — BASIC (1)
CSE 231 Language Laboratory — LOGO (1)
Group B:
CSE 232 Language Laboratory — FORTRAN (1)
CSE 233 Language Laboratory — COBOL I (1)
CSE 234 Language Laboratory — COBOL II (1)
CSE 235 Language Laboratory — PASCAL (1)
(Students cannot receive credit for both CSE 235 and CSE 130 or CSE 132)
CSE 236 Language Laboratory — PL/1 (1)
CSE 237 Language Laboratory — ADA (1)
CSE 238 Language Laboratory — C (1)
CSE 239 Language Laboratory — Modula-2 (1)
Group C:
CSE 240 Language Laboratory — LISP (1)
CSE 241 Language Laboratory — FORTH (1)
CSE 242 Language Laboratory — APL (1)
CSE 243 Language Laboratory — SNOBOL (1)
CSE 244 Language Laboratory — PROLOG (1)
CSE 245 Language Laboratory — SMALLTALK (1)
Prerequisite: CSE 130 or CSE 132 or knowledge of one other high level language.

CSE 248 Systems Analysis and Design (4)
Function and responsibility of the systems analyst, including techniques in interview, charts, design, analysis, development, presentation and implementation. Other topics discussed include cost/benefit analysis, EDP auditing, COM and word processing.
Prerequisite: CSE 220.

CSE 262 Data Structures
Elementary data structures and their application in computer programming. Linear lists, arrays, trees, forests and generalized lists and their implementation using sequential and linked storage. Recursive and non-recursive algorithms for representative data structure operations. Searching and sorting.
Prerequisite: CSE 132.

CSE 280 Computer Organization and Assembly Language Programming (4)
Introduction to the internal structure and operation of a digital computer. Hardware organization, machine language, instruction execution, digital arithmetic, addressing techniques and digital representations of data. Assembly language programming; assemblers and linkers; loading relocatable modules.
Prerequisite: CSE 171.

CSE 315 Computer Parsing of Natural Language (4)
An examination of the syntactic and semantic properties of natural language and a survey of the techniques for computer parsing. Course work will include student projects in the computer analysis of language. Identical to LIN 315.
Prerequisite: LIN/CSE 115 or ALS 176, CSE 130 or CSE 132.

CSE 335 Programming Languages (4)
Fundamental concepts in programming languages studied by means of comparative language analysis. Several high-level languages are studied in some 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.
Prerequisite: CSE 262, CSE 280, MTH 256 and major standing.

CSE 340 File Systems Design (4)
Study of hardware configurations and software systems design for data-oriented applications. Characteristics of mass-storage devices and the impact of the characteristics on data processing algorithm design, standard file access techniques, file design for data processing applications.
Prerequisite: CSE 130 or CSE 132, junior standing.

CSE 343 Foundations of Computer Science (4)
An introduction to the theoretical foundations of computer science. Recursive functions, computability in programming languages, validity of algorithms, finite automata, Turing machines.
Prerequisite: APM 263, CSE 262 and major standing.

CSE 345 Data Base Design and Implementation (4)
An introduction to the systematic design, creation and implementation of a relational data base using microprocessor-based data base management systems such as R:base 5000 and dBase III. The course will emphasize the practical applications of data bases and the solution of real-world problems. This course is intended for people wishing a minor in computer science; it may not be used for credit toward a degree program offered by the Department of Computer Science and Engineering.
Prerequisite: CSE 130 or CSE 132, junior standing.

CSE 358 Microcomputer Systems Software (4)
Microprocessor architecture, machine code, assembly language design and programming. Detailed design of basic systems, such as I/O subroutines, monitors, text editors, assemblers, disassemblers, disk I/O, printer control, traces, relocators and hardware checkout. Software development using threaded interpretive languages.
Prerequisite: CSE 280, major standing.

CSE 388 Computer Hardware Design (4)
Boolean function minimization using Boolean algebra, Karnaugh Map and Quine McCluskey method. Combinational network design using multiplexers, decoders, encoders and priority encoders. Code converter design using adder circuits. Logical system design using PLAs and Gate arrays. Sequential system: State minimization using row matching, implication chart and next class table methods. Sequential processor design. Keyboard decoding system. Introduction to computer organization, microprogramming and microprogram-controlled computer design. Students cannot receive credit for both CSE 388 and EE 378.
Prerequisite: CSE 171, PHY 152 and major standing.

CSE 413 Pattern Recognition (4)
Applications of digital computer techniques to a variety of problems in pattern recognition. Linear decision functions, Bayes decision theory, maximum likelihood estimation, multivariate normal features, nonparametric techniques, feature selection, clustering and unsupervised learning. Applications include industrial inspection and the processing of remote sensing, biomedical and pictorial data.
Prerequisite: MTH 256, CSE 262, a course in statistics and major standing.

CSE 415 Expert Systems and Decision Support Systems (4)
Study of approaches and issues in the design of decision support systems and expert systems. Generators and building tools, knowledge representations, iterative design process, evaluation methods. A project will be assigned.
Prerequisite: CSE 262 and CSE 335.

CSE 416 Artificial Intelligence (4)
Introduction to artificial intelligence, including: 1) current techniques in AI for knowledge representation and use, search methods, means-end analysis, network systems, production systems, frames, expert systems, genetic and other learning algorithms; 2) existing applications of AI with MYCIN, NETL, DENDRAL, checker player, chess player, natural language understanding; 3) an AI project requiring the creation of a working intelligent system in the student's area of interest.
Prerequisite: CSE 335, CSE 262.

CSE 417 Applied Numerical Methods: Approximations (4)
Propagation of errors; classical methods for the solution of non-linear equations, summation of series, approximation of functions, numerical integration, numerical solution of differential equations and the Fast Fourier Transform. Emphasis on student development of general purpose subroutines for use in engineering and scientific applications.
Prerequisite: CSE 132, MTH 254 or MTH 256, and major standing.

CSE 418 Applied Numerical Methods: Matrix Methods (4)
Systems of linear and nonlinear equations, eigenvalue problems, optimization methods, statistical methods.
Prerequisite: MTH 256, CSE 131 or CSE 132, and major standing.

CSE 438 Verification of Computer Programs (4)
Introduction to systematic methods of program verification, including proving and testing. Topics include program correctness, formal verification of programs, program and system testing, software tools. A significant part of the course will be its lab component.
Prerequisite: CSE 262, APM 263 and major standing.

CSE 439 Software Engineering (4)
The course will study, in a realistic environment, the techniques and methodology of developing programs for user applications. Topics include specifications, top-down modular design, structured programming, documentation, testing and verification.
Prerequisite: CSE 262 and major standing.

CSE 445 Data Base Systems (4)
A study of the design and implementation of relational, hierarchical and network data base systems. Query/update data languages, conceptual data model, physical storage methods, data base system architecture. Data base security and integrity. Relational data base systems are emphasized. A project involving an on-line data base system is normally assigned.
Prerequisite: CSE 262 and major standing.

CSE 447 Computer Communications (4)
Emphasis on functional characteristics of digital components related to computer communications and the design of computer communications control software; telecommunication transmission facilities, signal and conversion devices, terminals, controllers, interfaces, error detection and correction, multiplexing and concentration, line control procedures and protocols, and control software; case studies include point-to-point connections between computer and terminals, local area networks and private networks, and value-added networks and digital support in the telephone system.
Prerequisites: CSE 450 or equivalent or permission of the instructor.

CSE 450 Operating Systems (4)
Introduction to computer operating systems. A multi-programming operating system is viewed as a collection of cooperating processes designed for efficient use of the resources of the computer. Process control and synchronization, memory management and device management are the major topics.
Prerequisite: CSE 262, CSE 280 and major standing.

CSE 455 Introduction to Computer Graphics (4)
An introduction to the software and hardware aspects of computer graphics systems. Vector and raster displays. Typical data structures and programming language requirements. Emphasis on real time-interactive graphics systems.
Prerequisite: CSE 262, MTH 256 and major standing.

CSE 459 System Programming (4)
Introduction to the organization of computer systems with equal emphasis on both hardware and software as complementary entities. Views a system as a multilayer, hierarchically nested family of virtual machines. Topics: machine language level; executive (kernel) level; assembly level; batch, multiprogramming and time-sharing systems; file systems; design of multilevel machines. Class project.
Prerequisite: CSE 262, CSE 280 and major standing.

CSE 464 Computer Organization and Architecture (4)
Stored program computers, organization of arithmetic-logic unit, central processing unit, main and auxiliary memory, input/output units and exercises in microprogramming. Central and distributed processing computer networks, architecture of some main frame computers and some microprocessors, parallel and pipeline processing.
Prerequisite: CSE 280 and CSE 388 or CSE 470.

CSE 465 Translation of Computer Languages (4)
The student is directed through development of a compiler for a simple language that can be executed on a simulated computer. Topics include: overview of grammars and languages; scanning input strings from a source language; parsing via bottom-up methods; internal forms for source programs; semantic routines; and symbol table organization. The compiler is constructed in a high-level language such as PL/1.
Prerequisite: CSE 262 and APM 263. Corequisite: CSE 335.

CSE 470 Microprocessors and Microcomputers (4)
Introduction to microprocessors and microcomputers; interfacing microprocessors with external systems; programming considerations; hands-on laboratory experience. Credit cannot be earned for both CSE 470 and EE 470.
Prerequisite: CSE 171, PHY 152 and major standing.

CSE 471 Design of Embedded Software Computer Systems (4)
The use of threaded interpretive languages in the design of board-level computer systems. Embedded software drivers for parallel and serial communications, A/D converters and other peripheral interface devices. Project-oriented course.
Prerequisite: CSE 470. Corequisite: CSE 241.

CSE 478 Switching Theory and Digital Logic (4)
Combinational switching functions, minimization and analysis, implementation using relay circuits, TTL, CMOS and other popular logic families. Symmetric functions, threshold logic and interactive circuits. Analysis and synthesis of clock mode, level mode and pulse mode sequential circuits. Design and implementation of digital systems. Turing machines and finite automata.
Prerequisite: CSE 388 and APM 263.

ELECTRICAL ENGINEERING

EE 222 Introduction to Electrical Circuits (4)
Resistive and dc circuits, Kirchhoff laws, Thevenin and Norton theorems, controlled sources, operational amplifiers, superpositions, source transformers. Transients in RC, RL and RLC circuits, reactance, impedance and phasors. With laboratory.
Prerequisite: MTH 155, CSE 171 and PHY 152.

EE 326 Electronic Circuit Design (4)
Semiconductor diodes; static and dynamic characteristics; diode models; applications in linear and nonlinear circuits, with diodes. Bipolar and unipolar transistors, static and dynamic characteristics; transistor models, applications of bipolar and unipolar transistors in linear amplifiers; design of small signal amplifiers; inverters. Introduction to integrated circuits; operational amplifiers and their basic applications. With laboratory.
Prerequisite: EE 222, MTH 155, PHY 152 and major standing.

EE 345 Electric and Magnetic Fields (4)
Fundamentals of electric and magnetic fields. Fundamental laws, basic postulates, Maxwell's equations, electrostatics, magnetic fields of steady currents, time varying fields and electromagnetic waves.
Prerequisite: MTH 254 and SYS 325.

EE 351 Electromechanical Energy Conversion (4)
Ferromagnetism and magnetic circuits, transformers, three-phase circuits, principles of eletromechanical energy conversion. Steady state operation of dc and ac machines.
Prerequisite: SYS 325.

EE 378 Design of Digital Systems (4)
Development of the components and techniques at the gate and flipflop level needed to design digital systems for instrumentation, communication, control and related fields. Topics include combinational logic circuits, memory devices, sequential circuits and organization of digital systems. Students cannot receive credit for both EE 378 and CSE 388.
Prerequisites: CSE 171 and EE 326.

EE 384 Electronic Materials and Devices (4)
Basic concepts of quantum mechanics as applied to electronic devices. Semiconductor physics, including carrier densities, diffusion and conduction mechanisms. Theory of P-N junction and junction devices. Also included are FET, CCD and MOS devices. Fabrication and fundamentals of integrated circuits.
Prerequisite: ECE 326.

EE 426 Advanced Electronics (4)
Transistor circuit analysis. Negative feedback in amplifiers, frequency response and stability of amplifiers, amplifier design. Linear and nonlinear amplifier circuits; analog active filters; broadband amplifiers; audio power amplifiers. Regulators in power supplies, design of regulators. Signal generators, multivibrators, function generators and their design.
Prerequisites: EE 326 and SYS 325.

EE 437 Introduction to Communication Electronics (4)
Analysis and design of analog and digital electronic data communication systems. Spectral analysis; amplitude and angle modulation; demodulation techniques; filtering; frequency- and time-division multiplexing. The sampling theorem and digital data transmission. With laboratory.
Prerequisites: SYS 325 and EE 326.

EE 470 Microprocessors and Microcomputers (4)
Introduction to microprocessors and microcomputers; interfacing microprocessors with external systems; programming considerations; hands-on laboratory experience. Credit cannot be earned for both EE 470 and CSE 470.
Prerequisite: EE 378 or CSE 418.

EE 472 Microcomputer-based Control Systems (4)
Microcomputer-aided control design techniques combined with single-chip and single-board microcomputer technology. Digital controller design and implementation; digital filtering/state estimator design and implementation; multiple processor systems and real-time applications.
Prerequisite: SYS 325, EE 326, EE 470 and programming experience.

EE 487 Integrated Electronics (4)
Crystal growth — bulk and epitaxial techniques. Fabrication of P-N junctions; ion implantation; integrated circuits technology; semiconductor materials; tunnel diodes, photodiodes; light-emitting diodes; semiconductor lasers; switching devices.
Prerequisite: EE 384.

MECHANICAL ENGINEERING

ME 221 Statics and Dynamics (4)
Introduction to mechanics, particle statics and dynamics, equilibrium, analysis of structures and dynamics of rigid bodies about fixed axes. With laboratory.
Prerequisite: MTH 155. Corequisite: PHY 151.

ME 241 Thermodynamics (4)
Introduction to the fundamental concepts, principles and analytical techniques of classical thermodynamics. Study of various forms of energy, its conversion from one form to another and the effects of both energy conversions and energy transfers on system and material properties. Macroscopic properties and thermodynamics property relationships are studied, along with the fundamental laws of thermodynamics. Application of the basic concepts and principles to engineering systems and processes. With laboratory.
Prerequisite: CHM 144 or CHM 164, MTH 155, PHY 151.

ME 321 Dynamics and Vibrations (4)
Kinematics and dynamics of systems of particles. Work and energy, impulse and momentum. Planar rigid body motion. Lagrange's equations of motion. Vibration of lumped mechanical systems. Comprehensive study of one-degree of freedom motion including torsional vibration. Applications to engineering problems.
Prerequisite: ME 221, APM 257. Corequisite SYS 325.

ME 331 Introduction to Fluid and Thermal Energy Transport (4)
Introduction to the fundamentals of fluid mechanics and heat transfer; conservation and momentum principles; viscuous and inviscid flow; laminar and turbulent flow; introduction to viscous and thermal boundary layer theory; one-dimensional conduction heat transfer and characteristics and dimensionless correlations of convection heat transfer; applications to problems of engineering interest. With laboratory.
Prerequisite: ME 221, ME 241, MTH 254 and major standing.

ME 361 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. Yield and fracture criteria of materials with applications to design. With laboratory.
Prerequisite: EGR 372, ME 221.

ME 438 Fluid Transport (4)
Continued study of the fundamentals of fluid mechanics and their applications, angular momentum principle; generalized study of turbomachines, potential flow of inviscid fluids, laminar and turbulent boundary layer theory, dimensional analysis and similitude, compressible flow.
Prerequisite: ME 241, ME 331 and APM 257.

ME 448 Thermal Energy Transport (4)
Continued study of basic concepts, properties and descriptions of conduction, convection and thermal radiation heat transfer; thermal boundary layer theory; forced and natural convection, convective heat transfer correlations, combined conduction convection. Thermodynamics of thermal radiation, radiation intensity, surface properties and energy exchange. With laboratory.
Prerequisite: ME 241, ME 331 and APM 257.

ME 449 Numerical Techniques in Heat Transfer and Fluid Flow (4)
Overview of practical numerical solution techniques. Major emphasis is on concepts, methodology, and physics associated with the formulation of the discretization equations appropriate for the representation and solution of linear and nonlinear partial differential equations governing heat transfer and fluid flow. Personal and mainframe computers will be used for the solution of a variety of problems.
Prerequisite: ME 438 and ME 448 or equivalent.

ME 454 Solar and Alternate Energy Systems (4)
The analysis and design of energy conversion systems. Principles of optimum power transfer and efficiency. Availability analysis of systems for heating, chemical conversion and electrical generation. Emphasis on solar applications and alternative energy technology.
Prerequisite: ME 241 and ME 331.

ME 456 Energy Systems Analysis (4)
The analysis of thermodynamic cycles including those applicable to: vapor power systems, gas turbine and reciprocating engines, and vapor-compression refrigerators and heat pumps. The concepts of available energy and irreversibility. The thermodynamics of reacting mixtures, including chemical equilibrium, applied to combustion systems.
Prerequisite: ME 241 and major standing.

ME 461 Analysis and Design of Mechanical Structures (4)
Use of methods of advanced mechanics of materials to design mechanical structures to meet elastic strength criteria. Topics include plates and shells, torsion of noncircular cross-sections, curved and composite beams, energy methods and mechanical stability.
Prerequisite: ME 361.

ME 472 Materials Properties and Processes (4)
Mechanical behavior of materials. True stress/strain properties of materials, plastic deformation and fracture of materials, failure theories, fatigue damage under cyclic loading, creep and high temperature application, destructive and nondestructive evaluation of material properties such as composites, ceramics and metals; behavior of materials during manufacturing processes such as stamping, drawing, extrusion, spinning, forging and others.
Prerequisite: ME 361 and EGR 372.

ME 482 Fluid and Thermal Energy Systems (4)
Study of systems involving fluid and thermal phenomena. Includes conventional and unconventional energy conversion, fluid and thermal energy transport. Analysis, design and optimization of systems are emphasized using basic integral, differential and lumped-parameter modeling techniques. The course bridges conventional engineering design disciplines.
Prerequisites: ME 241, ME 331 and APM 257.

ME 486 Machine Design (4)
Analysis and design of machine elements and systems. Stress, strain, strength and cost considerations. Design optimization criteria. Applications of fasteners, shrink-fits, springs, bearings, lubrication, power transmitting elements and complex structures subjected to static and/or dynamic loads.
Prerequisite: ME 361.

ME 487 Mechanical Engineering CAD/CAM Systems (4)
Introduction to the use of CAD/CAM systems in mechanical engineering design. Fundamentals of computer graphics, finite element techniques and interactive design. Use of finite elements to analyze static and dynamic mechanical systems.
Prerequisite: ME 361, ME 321 and MTH 256.

SYSTEMS ENGINEERING

SYS 317 Engineering Probability and Statistics (3)
Elements of probability for discrete and continuous random variables. Examples and problems from quality control, communication, reliability and other engineering areas.
Prerequisite: Major standing. Corequisite: MTH 254 or MTH 256.

SYS 325 Lumped-parameter Linear Systems (3)
Laplace transform methods, transfer functions and impedance concepts in the analysis of electrical and mechanical lumped-parameter linear systems. Natural and forced behavior of first- and second-order systems. Relationship between pole-zero pattern and dynamic response. Frequency response methods. Computer techniques for analysis and design.
Prerequisite: EE 222, APM 257 and major standing.

SYS 410 System Optimization and Design (4)
Introductory convexity theory, necessary and sufficient optimality conditions. Computer techniques for systems optimization and design. Direct and indirect search techniques, including line search, linear programming, unconstrained and constrained optimization. The course emphasizes a capstone design experience involving systems modeling, simulation and optimal design.
Prerequisite: MTH 256, knowledge of PASCAL or FORTRAN and major standing.

SYS 422 Intelligent Robots (4)
Overview of industrial robots and components. Geometry of robots and control. Machine intelligence. Programming languages for motion and vision. Laboratory experience with computer-controlled robots.
Prerequisite: SYS 325.

SYS 431 Automatic Control Systems (4)
Performance specifications for automatic control systems. Modeling transfer functions, signal flow graphs and Mason's gain formula. Static error coefficients, stability theory and Routh's criterion. The root locus method. Frequency response and the Nyquist criterion. Design of compensation networks.
Prerequisite: SYS 325.

SYS 433 Modern Control System Design (4)
Classical design methodology for control systems, state variable modeling, linear input/output systems, modal analysis, state feedback control, system design by pole-placement methods. The course emphasizes a capstone design project for which the student is required to model, design, implement and evaluate a controller for a physical system.
Prerequisite: SYS 431.

SYS 458 Electrical Energy Systems (4)
Generation and transmission of electrical energy systems. Analytical methods for solution of planning/operational problems with computer utilization. Analysis of synchronous machines, transformer excitation, prime mover governing, transmission networks and loads. System dynamic performance under disturbance conditions, line switching, and parameter variations with attention to frequency and voltage control strategies.
Prerequisite: SYS 325.

SYS 463 Foundations of Computer-aided Design (4)
The design of computer graphics software for electrical, mechanical and systems engineering. Raster graphics fundamentals, fill algorithms, transformations, curve generation, user input techniques and 2-D animation. Application programs using data structure are written in PASCAL.
Prerequisite: CSE 262 and major standing.

SYS 469 Simulation in Engineering (4)
Basic modeling and simulation methodology for discrete and continuous systems. The selection of input parameters and probability distributions. On-line user interactive graphical displays for output analysis and validation.
Prerequisite: CSE 262 and major standing.

SYS 483 Production Systems (4)
Computer manufacturing systems that control the flow of manufactured products from forecast to ordering; parts explosion, bill-of-material, Pareto distribution and inventory control, lead times, shop floor control, etc. All illustrated by a computer system.
Prerequisite: SYS 317.

SYS 485 Statistical Quality Control (4)
Fundamentals of statistical quality control with particular emphasis on applications. Control charts for mean and range for variable, control charts for attributes, cusum charts, runs and other process quality monitoring topics. Single, double and multiple sampling inspection plans, sequential sampling and related topics.
Prerequisite: SYS 317.

SCHOOL OF HEALTH SCIENCES

Interim Dean: *Joel W. Russell*

Office of the Dean: *Fred W. Stransky, associate dean for community health; Arthur J. Griggs, assistant to the dean; A. Jayne Hoskin, academic adviser*

Consulting professors: *Duane L. Block, David Jacknow, Joseph A. Rinaldo, Jr., Julius Rutzky, Michael R. Schwartz, Robert L. Segula, Robert R. Silver, John R. Ylvisaker, Richard J. Zuelker*

Clinical professors: *Seymour Gordon, Myron M. LaBan, Gerald C. Timmis*

Clinical associate professors: *Ali A. Abbasi, George R. Gerber, Nasir Ul Haque, John R. Pfeifer, David R. Pieper, Alexander Ullman*

Clinical assistant professors: *Jaime V. Aragones, Arnold L. Brown, Nitin C. Doshi, Moufid Mitri*

The School of Health Sciences offers degree and non-degree programs in health and medically related fields. Currently, programs leading to the Bachelor of Science degree include industrial health and safety, medical physics, medical laboratory sciences, perfusion technology and physical therapy. A program leading to the Master of Science degree is offered in exercise science. Non-degree programs at the undergraduate level include exercise science and health behavioral sciences.

Health Science Core Curriculum

The health science core curriculum is a common component of introductory course work required for each of the baccalaureate programs offered through the School of Health Sciences. The core curriculum also represents an appropriate starting point for undecided health science students, since its flexibility allows for entry into any of the health science programs at Oakland University, as well as most health science degree programs at other universities.

Admission to major standing in medical laboratory sciences, perfusion technology and physical therapy is both selective and competitive. Completion of the health science core curriculum is one prerequisite for admission. Students planning to major in these areas will be classified as pre-laboratory sciences or pre-physical therapy majors until they have been granted major standing.

The programs in industrial health and safety and medical physics do not incorporate a pre-professional component; thus, students may declare either major upon entry to the university. In these cases, the core curriculum will be completed during the course of the baccalaureate program. Early completion of some of the core curriculum courses is recommended, since they are prerequisites to required advanced courses in the industrial health and safety or medical physics programs.

The academic requirements for each of the baccalaureate programs of the school are described in the pages that follow. In addition to the core curriculum, the requirements include additional prerequisite-level course work that complements the core curriculum, the program major course requirements, the university general education requirements and the university writing proficiency requirement.

Students completing the core curriculum course work at Oakland University may, in some instances, substitute equivalent or higher level courses for core curriculum courses; this action must be approved by the appropriate program director and the School of Health Sciences Committee on Instruction. 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, general education or program course work requirements have been met.

Core curriculum courses*

BIO 190, 200, 321 or BIO 200, 205, 207
CHM 144-145
MTH 141 or 154
STA 225 or 226
PHY 101-102 or 151-152
HBS 200
HS 101
*See the academic requirements of the individual health science programs for core curriculum course preferences or requirements.

Course Offerings

HS 101 Careers in the Health-Related Professions (0)
Seminar/survey of professional opportunities in the various health fields such as medical technology, histotechnology, cytotechnology, nuclear medicine technology, exercise science, industrial health and safety, medical physics, physical therapy, perfusion technology, occupational therapy, respiratory therapy and pharmacy.

HS 201 Health in Personal and Occupational Environments—Ideas, Concepts, Issues and Applications (4)
Current information about the impact of environmental and life-style factors on health. Examination of issues related to human exposure to physical, chemical and biological stresses. The impact of exercise, weight control, substance abuse, nutrition and stress management on a person's ability to cope with environmental stresses will be analyzed. *Satisfies the university general education requirement in natural science and technology.*

HS 331 Pharmacology (2 or 3)
An introduction to the principles of pharmacology. Emphasis on actions of drugs affecting the cardiovascular system and commonly used in cardiac surgery. Jointly offered with NRS 230.
Prerequisite: BIO 207 or 321.

HS 361 Cardiovascular Physiology/Pathology (3)
Intensive study of the physiologic principles and disease mechanisms of the human cardiovascular system.
Prerequisite: BIO 207 or 321.

HS 363 Respiratory and Renal Physiology/Pathology (3)
Intensive study of the physiologic principles and disease mechanisms of the human respiratory and renal systems.
Prerequisite: BIO 207 or 321.

HS 400 Seminar (0)
Discussions of recent advances and topics of current interest. Graded S/U.
Prerequisite: Senior standing.

HS 401 Introductory 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.
Prerequisites: BIO 200, 321.

HS 405 Special Topics (2, 3 or 4)
Prerequisite: Permission of instructor.

DEPARTMENT OF KINESIOLOGICAL SCIENCES

Chairperson: *Osa Jackson*

Exercise Science Program Director: *Larry S. Carr*

Physical Therapy Program Director: *Osa Jackson*

Exercise Science Graduate Program Coordinator: *John R. Stevenson*

Physical Therapy Clinical Coordinator: *Christine Pillow*

Associate professors: *Osa Jackson (Physical Therapy), Fred W. Stransky (Exercise Science)*

Assistant professors: *Larry S. Carr (Exercise Science), Kornelia Kulig (Physical Therapy), John R. Stevenson (Exercise Science)*

Special instructors: *Henry R. DeLorme (Exercise Science), Pamela A. Hilbers (Physical Therapy), Christine Pillow (Physical Therapy)*

Clinical professors: *A. Charles Dorando (Physical Therapy), Freddy M. Kaltenborn (Physical Therapy)*

Clinical associate professors: *Barry A. Franklin (Exercise Science), Murray B. Levin (Exercise Science)*

Clinical assistant professors: *Joseph A. Arends (Exercise Science), Allen L. Babcock (Physical Therapy), William R. Back (Exercise Science), John J. Karazim (Exercise Science), Frank Kava (Physical Therapy), Kristie S. Kava (Physical Therapy), John F. Kazmierski (Exercise Science), Frederick P. Maibauer (Physical Therapy), Creagh M. Milford (Exercise Science), Rajendra Prasad (Exercise Science), Thomas E. Schomaker (Exercise Science)*

Clinical instructors: *Cathy Larson (Physical Therapy), Robert C. Nestor (Exercise Science), Elizabeth Fromm Ross (Physical Therapy), Dorothy J. Smith (Physical Therapy)*

The Department of Kinesiological Sciences administers the programs in exercise science and physical therapy. These programs share many common goals in research, teaching and service that relate to the study of human motion.

Exercise Science Program

Director: *Larry S. Carr*

The exercise science program offers elective courses for students interested in the relationships among physical activity and weight control, disease prevention, stress management, nutrition and 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 recent emphasis placed on health promotion and disease prevention within the health care delivery system.

A description of the Master of Science in exercise science program is printed in the *Oakland University Graduate Catalog.*

Physical Therapy Program

Director: *Osa Jackson*

The physical therapy program has a three-fold purpose. The first is to provide an educational program that prepares students for the Bachelor of Science degree and a professional career in physical therapy. The second is to provide opportunities for the advancement of knowledge in physical therapy through research. The third is to provide service to the public. This is done, in part, through continuing education courses and lectures, and by providing a resource of physical therapy expertise. With its three-fold purpose, the physical therapy program is an integral part of the university, providing students opportunities to develop personal skills for productive citizenship, along with the professional skills of physical therapy.

Physical therapy itself is an integral part of the health care system. Physical therapists are concerned with the prevention and treatment of acute and chronic conditions that cause disorders of movement. In order to provide appropriate treatment, a thorough knowledge of the neuromusculoskeletal and cardiopulmonary systems is paramount so that patients can be knowledgeably evaluated and their problems identified. Following evaluation, a treatment program is developed to resolve the problems. Physical therapists work in concert with the referring physician and other members of the rehabilitation team.

Evaluation, prevention and treatment of movement disorders requires specific knowledge of basic and applied medical science. Such understanding is built upon a foundation of the basic sciences of biology, chemistry, physics, anatomy, physiology, kinesiology and pathology. Of equal importance is a background in the behavioral sciences, for this provides basic knowledge in the development of interpersonal relationships with patients, families and other health professionals.

Oakland University physical therapy students follow an academic program based on the educational guidelines of the American Physical Therapy Association.

Entry into the physical therapy program is competitive, and is contingent upon satisfactory completion of the health science core curriculum, required courses complementing the core curriculum, and the university general education requirement. Acceptance is based on academic performance, letters of recommendation, exposure to the profession and personal interviews. Application to the physical therapy program typically occurs in the winter semester of the sophomore year and may be initiated by Oakland University students or by students transferring from other institutions. Transfer students must demonstrate completion of a pre-professional curriculum equivalent to Oakland University's in terms of both content and semester hour total (71 semester hour credits). Transfer students are reminded that a maximum of 62 semester hour credits are transferable from a community or junior college (see page 8).

By 1990, Oakland University plans to modify the physical therapy program from its present baccalaureate curriculum to a master's degree program. Therefore, pre-physical therapy students entering Oakland University during the 1986-87 academic year should understand that the physical therapy program may change in character and requirements from its description in this catalog by the time they are eligible to apply for admission to the program. Students will be kept informed of these changes as well as any changes in prerequisites for application to the future master's-level program.

Requirements for the B.S. degree with a major in physical therapy

Students seeking the Bachelor of Science degree with a major in physical therapy must complete 162 credits through the following requirements:

1. Complete the writing proficiency requirement. In satisfying this requirement, students may need to complete RHT 100 and RHT 101 or their equivalent at another college or university. Credits associated with these courses are not included in the 162 credits required for this degree.

2. Meet the university general education requirements, as detailed on pages 25-28. In completing the health science core curriculum and major program requirements, physical therapy majors will automatically satisfy the field groups in mathematics, logic and computer science, in natural science and technology, and in social science.
3. Complete the health science core curriculum. The biology sequence of BIO 190, BIO 200 and BIO 321 is required for physical therapy majors. (Students with strong high school backgrounds in biology may place out of general biology courses. In those cases, it is strongly recommended that alternate, upper-division biology courses be substituted, such as BIO 250, 305, 323, 325 and 351.)
4. Complete BIO 322, PHY 158, PSY 100 and PSY 331, all of which complement the core curriculum.
5. Complete the major program, as follows: BIO 381 and 460; HS 331 and 401; EXS 304 and 320; PT 301, 321, 322, 323, 324, 331, 341, 342, 343, 351, 425, 432, 443, 444, 445, 446, 452 and 453.

Grade point policy

Students must maintain a 2.50 or better grade point average in course work applied to the physical therapy major. Students whose grades fall below 2.50 will be placed on probation and reviewed by the Physical Therapy Promotion and Graduation Committee. The review may result in remediation or dismissal from the program.

A final grade below 2.0 in any physical therapy course required for the major will place a student on probation. A method of remediation, to be determined by the committee, must be successfully completed in order for a student to continue in the program. All courses must be passed in sequence, and no student may advance in the program while on probation.

Students who earn a grade below 2.0 in two or more physical therapy courses will not be allowed to continue in the program.

Code of ethics

Since ethical conduct is critical to a health profession, students are required to abide by the Physical Therapy Code of Ethics and Guide for Conduct, published by the American Physical Therapy Association. Violations will be reviewed by the Physical Therapy Promotion and Graduation Committee and could result in dismissal from the program.

Course Offerings

EXERCISE SCIENCE

EXS 101 Exercise (jogging) and Health Enhancement (2)
An examination of lifestyle factors related to disease prevention and improved quality of life. This course combines regular exercise and health enhancement lectures. The mode of exercise in this course is walking-jogging. Course content in EXS 101, 102 and 104 includes the same lecture topics. Students who have received credit or who are currently enrolled in EXS 102 or 104 may not repeat the lecture material or final examination. An independent project and/or a different final examination must be completed before receiving credit.

EXS 102 Exercise (swimming) and Health Enhancement (2)
An examination of lifestyle factors related to disease prevention and improved quality of life. This course combines regular exercise and health enhancement lectures. The mode of exercise in this course is swimming. Course content in EXS 101, 102 and 104 includes the same lecture topics. Students who have received credit or who are currently enrolled in EXS 101 or 104 may not repeat the lecture material or final examination. An independent project and/or a different final examination must be completed before receiving credit.

EXS 103 Exercise (strength training) and Health Enhancement (2)
An examination of lifestyle factors related to disease prevention and improved quality of life. This course combines regular exercise and health enhancement lectures. The mode of exercise in this course is strength training.

EXS 104 Exercise (aerobics) and Health Enhancement (2)
An examination of lifestyle factors related to disease prevention and improved quality of life. This course combines regular exercise and health enhancement lectures. The mode of exercise in this course is aerobics. Course content in EXS 101, 102, and 104 includes the same lecture topics. Students who have received credit or who are currently enrolled in EXS 101 or 102 may not repeat the lecture material or final examination. An independent project and/or a different final examination must be completed before receiving credit.

EXS 180 Exercise (Judo) and Health Enhancement (2)
An examination of lifestyle factors related to disease prevention and improved quality of life. This course combines regular exercise and health enhancement lectures. The mode of exercise in this course is judo.

EXS 202 Introduction to Exercise Science (2)
An examination of graduate and occupational opportunities in exercise science. This course includes special topics in motor learning, exercise physiology, kinesiology and sports medicine.

EXS 204 Weight Control, Nutrition and Exercise (4)
Theories dealing with weight loss and nutrition including such topics as fundamental nutrition, the relationship of foods to weight control, the physiology of weight loss and the body's internal weight control mechanisms. Included are laboratory experiences to help students apply concepts. Recommended for students attempting to develop the necessary skills for successful weight loss and improved nutritional habits.

EXS 207 American Red Cross Advanced First Aid (4)
Understanding of procedures in the immediate and temporary care of victims of an accident or sudden illness. In addition, course content includes "safety-proofing" facilities and equipment.

EXS 211 American Red Cross Senior Lifesaving and Water Safety Instruction (4)
Principles and procedures for swimming, lifesaving and water safety with student participation. ARC certification upon successful completion of course.

EXS 215 Stress Management (2, 3 or 4)
Concepts and techniques to enable students to manage stress more effectively.

EXS 304 Exercise Physiology (4)
Effects of exercise and physical training on the physiological systems of the body, with emphasis on cardiorespiratory systems. Includes muscle contraction mechanisms, circulatory and respiratory adjustment during exercise, and nutrition for physical activity. Laboratory experiences are provided for insight into the dynamics of human performance.
Prerequisite: BIO 104.

EXS 320 Kinesiology (4)
This course deals with the study of the human musculoskeletal system and its functions, interrelationships, and involvement in the mechanics of human motion. Emphasis will be placed on normal function; topics in abnormalities and physical dysfunction may be included on a limited basis.
Prerequisite: Admission to Program in Physical Therapy.

EXS 350 Human Motion Analysis (4)
The study of basic mechanical and kinesiological principles and their functions, interrelationships,and involvement with the mechanics of human motion.
Prerequisite: BIO 205.

EXS 493 Independent Study and Research (1, 2, 3 or 4)
Special study areas and research in exercise science.
Prerequisite: Departmental permission.

PHYSICAL THERAPY

PT 301 Introduction to Physical Therapy (4)
Theory and practice of basic therapeutic techniques utilized in physical therapy. Includes medical emergencies, massage, mobility training, and basic communication skills.

PT 321 Physical Therapy and the Human Life Cycle I: Infancy through Adolescence (3)
This course explores human developmental progression from conception up to and including adolescence through classroom and experiential means.

PT 322 Physical Therapy and the Human Life Cycle II: Adulthood and Aging (2)
This course describes the normal age related changes from adulthood into old age in terms of physiology, psychology, sociology and environmental resources. The focus of this course is to highlight how patient assessment needs to be adapted in light of normal age related changes.

PT 323 Clinical Medicine and Physical Therapy (4)
Lecture series covering the etiology, signs and symptoms, course, treatment, and implications for physical therapy, of conditions managed by various medical specialties.

PT 324 Emotional Aspects of Disability (3)
Survey of the various factors impinging upon the patient, the family, and ultimately the patient-physical therapist relationship and what the physical therapist needs to consider when interacting with the patient or family.

PT 331 Evaluation Procedures (4)
Basic principles and techniques of manual muscle testing, goniometry, sensory and reflex testing, and neurodevelopmental assessment.

PT 341 Physical Agents (3)
Principles and use of superficial and deep heat, cold, infrared and ultraviolet radiation, and hydrotherapy in therapeutic evaluation and treatment.

PT 342 Electrotherapy (3)
Principles and use of AC and DC for therapeutic use and/or electrodiagnosis. Lecture/laboratory to include HVG's, TENS, Iontophoresis, FES, Electrodiagnosis, NCV and EMG.

PT 343 Therapeutic Exercise (4)
Theory and techniques of basic and traditional exercises including general and localized strengthening, relaxation, mobility, immobility, coordination and posture.

PT 351 Clinical Education (3)
Orientation to clinical education including the practice of basic evaluation and treatment skills through supervised experience in the clinical environment.

PT 402 Cardiac Rehabilitation and Physical Therapy (1, 2, 3 or 4)
Principles and techniques of implementing the physical therapy portion of a cardiac rehabilitation program. Includes certification in advanced cardiac life support.

PT 403 Orthopedic Physical Therapy (1, 2, 3 or 4)
Theory and techniques of orthopedic physical therapy.

PT 404 Orthopedic Physical Therapy Practicum (1, 2, 3 or 4)
A directed study dealing with the clinical application of orthopedic physical therapy.

PT 405 Special Topics (1, 2, 3 or 4)
Prerequisite: Departmental permission.

PT 406 Physical Therapy and Advanced Pediatrics (1, 2, 3 or 4)
Advanced theory and principles of physical therapy care of pediatric patients.

PT 407 Physical Therapy and Clinical Pediatrics (1, 2, 3 or 4)
A directed study dealing with the clinical application of advanced physical therapy techniques for the pediatric patient.

PT 408 Physical Therapy and Aging (1, 2, 3 or 4)
Theoretical and research perspectives of aging with emphasis on implications for physical therapy health care provision.

PT 409 Physical Therapy and Clinical Gerontology (1, 2, 3 or 4)
A directed study dealing with the clinical considerations of physical therapists working with a geriatric population.

PT 425 Physical Therapy Administration and Health Care Delivery (3)
Discussion and group experiences dealing with various aspects related to the administration of a physical therapy service including: patient care audit, policies and procedures, problem oriented medical record systems, and quality assurance.

PT 432 Research in Physical Therapy (4)
Theory and application of the principles of problem solving and the scientific method, with emphasis on current research in physical therapy, towards the completion of a small scale project.

PT 443 Cardiopulmonary System (3)
Theoretical, clinical and research perspectives to medical and surgical conditions involving the cardiopulmonary system as seen by physical therapists. Includes exercise prescription, ECG analysis, and use of clinical tools for individual assessment of a patient's cardiopulmonary status.

PT 444 Neuromuscular System (4)
Theory, principles, and application of neurophysiologic approaches to therapeutic exercise for neuromuscular problems.

PT 445 Rehabilitation Procedures (4)
Therapeutic program planning for the physically impaired (i.e. spinal cord injured, amputees, close head injured, stroke impaired) with emphasis on mobility training, activities of daily living, recreation, home evaluation, and family involvement. Includes principles and rationale for prescription of prosthetics and orthotics.

PT 446 Musculoskeletal Systems (3)
A lecture and laboratory series of medical and surgical conditions seen by physical therapists, with emphasis on orthopedic and athletic conditions.

PT 452 Clinical Education II (3)
Continuation of PT 351.

PT 453 Clinical Education III (12)
An 18-week full-time clinical experience. Occurs during the winter semester in a variety of locations. Students must provide their own transportation and living expenses.

DEPARTMENT OF LABORATORY SCIENCES

Chairperson: *Lynne Williams*

Medical Laboratory Sciences Program Director: *Lynne Williams*

Medical Physics Program Director: *Abraham R. Liboff*

Perfusion Technology Program Director: *Harry R. Hoerr, Jr.*

Medical Physics Associate Director: *Michael Chopp*

Medical Laboratory Sciences Clinical Coordinator: *Mary L. Sherman*

Perfusion Technology Clinical Coordinator: *Michael Kraemer*

Cytotechnology Directors: *Allan J. Levine (William Beaumont Hospital) and Richard J. Pollard (Harper Hospital)*

Histotechnology Director: *Abdul A. Al Saddi*

Nuclear Medicine Technology Medical Director: *Michael M. Joh*

Cytotechnology Associate Director: *Edward G. Bernacki (William Beaumont Hospital)*

Professors: *Abraham R. Liboff (Medical Physics), Norman Tepley (Medical Physics)*

Associate professors: *Michael Chopp (Medical Physics), Lynne Williams (Medical Laboratory Sciences)*

Special instructors: *Harry R. Hoerr, Jr. (Perfusion Technology), Michael Kraemer (Perfusion Technology), Mary L. Sherman (Medical Laboratory Sciences)*

Clinical professors: *Jay Bernstein (Cytotechnology and Histotechnology), Howard J. Dworkin (Medical Physics), Harold D. Portnoy (Medical Physics), Gerald C. Timmis (Medical Physics), Richard H. Walker (Medical Technology)*

Clinical associate professors: *Donovan M. Bakalyar (Medical Physics), Michael Chopp (Medical Physics), Wayne L. Eaton (Medical Technology), Norman H. Horwitz (Medical Physics), James J. Humes (Medical Technology), Barbara J. Jenkins (Medical Technology), John H. Libcke (Medical Technology), Kenneth R. Meyer (Medical Technology), Sundara B.K. Raman (Medical Technology), Taljit S. Sandhu (Medical Physics), Boris K. Silberberg (Medical Technology)*

Clinical assistant professors: *Abdul A. Al Saadi (Histotechnology), Morris I. Bank (Medical Physics), Billy B. Baumann (Medical Laboratory Sciences), William B. Fuqua (Medical Laboratory Sciences), Evelyn R. Hansen (Medical Laboratory Sciences), Michael B. Smith (Medical Physics)*

Clinical instructors: *Lois A. Beerbaum (Medical Technology), Raymond A. Carlson (Medical Physics), Mara Christiansen (Medical Technology), Dorothy Cummings (Histotechnology), Susan Dingler (Cytotechnology), James R. Ewing (Medical Physics), Deanna Dupree Klosinski (Medical Technology), Margaret M. Kluka (Medical Technology), Ross L. Lavoie (Cytotechnology), Charlene Rencher (Nuclear Medicine Technology), Joyce Salancy (Medical Technology), Carolyn A. Shalhoub (Medical Technology), Deborah Thompson (Medical Technology), John T. Waugh (Medical Technology), Robert Weimer (Histotechnology)*

The Department of Laboratory Sciences administers the programs in medical laboratory sciences, medical physics and perfusion technology.

Medical Laboratory Sciences Program

The medical laboratory sciences program is designed to prepare students for professional opportunities in a variety of clinically related fields. The four specializations within the program are cytotechnology, histotechnology, medical technology and nuclear medicine technology. All specializations are designed to provide students with a strong background in both basic and clinical sciences.

The curriculum of each specialization meets basic requirements for entry into post-baccalaureate professional programs. In clinical settings, medical laboratory scientists perform many routine and specialized laboratory tests for the purpose of developing data for the determination of the presence and extent of disease, as well as implications pertaining to the cause of disease. Cytotechnologists and histotechnologists are involved in the diagnosis of disease based on cellular or tissue alterations. Medical technologists perform a wide range of diagnostic procedures, including the various chemical, microscopic, bacteriological and immunological procedures used in the diagnosis and study of disease. Nuclear medicine technologists utilize small amouts of radioactive materials for diagnostic evaluations of the anatomic or physiologic conditions of the body and to provide therapy with radioactive sources.

Admission to the professional part of these programs is restrictive and selective, and occurs in the winter semester of the sophomore year, either by progression of students enrolled at Oakland University or by transfer from other institutions. Acceptance into the professional part of the programs is contingent upon satisfactory completion of the health science core curriculum, required courses complementing the core curriculum and the university general education requirements.

The medical laboratory sciences programs have enrollment quotas that are filled with preference to applicants judged to be best qualified to complete the programs. Admission is based on grades, personal interviews and, where appropriate, letters of recommendation.

Requirements for the B.S. degree with a major in medical laboratory sciences

Students seeking the Bachelor of Science degree with a major in medical laboratory sciences must complete 136 credits through the following requirements:

1. Complete the writing proficiency requirement. In satisfying this requirement, students may need to complete RHT 100 and RHT 101, or their equivalents, at another college or university. Credits associated with these courses are not included in the 136 credits required for this degree.
2. Meet the university general education requirements, as detailed on pages 25-28. In completing the health science core curriculum, medical laboratory sciences majors will automatically satisfy the field groups in mathematics, logic and computer science, and in natural science and technology.
3. Complete the health science core curriculum.
4. Complete BIO 322, CHM 149, CHM 203-204 and MLS 201, all of which complement the core curriculum.
5. Complete the major course requirements specified under one of the four medical laboratory sciences specializations (cytotechnology, histotechnology, medical technology or nuclear medicine technology).

Academic standing

To be accepted to major standing, students should have at least a 3.00 overall grade point average. Students with lower grade point averages may be admitted to provisional major standing pending completion of fall semester, junior year course work, in which a semester grade point average of 2.70 or higher shall be earned, with no course grade below 2.0.

Cumulative grade point

Students must maintain a cumulative grade point average of 2.70 in all course work applied o the medical laboratory sciences major.

Probationary status/non-continuation in the program

Students in the major program (specialization) will be placed on probation if they earn a rade less than 2.0 in any course or if their cumulative grade point average in major course work alls below 2.70. Students who earn a second grade less than 2.0 must have their programs reviewed y the faculty to determine remediation or termination from the program.

In order to remove probationary status, students must raise their major grade point average o 2.70 or higher.

Specialization in cytotechnology

Directors: *Allan J. Levine (William Beaumont Hospital) and Richard J. Pollard (Harper Hospital)*

Associate Director: *Edward G. Bernacki (William Beaumont Hospital)*

A cytotechnologist is a trained medical laboratory technologist who detects cell disease by ght microscopic examination of cell samples from all areas of the human body.

Students may be accepted into the cytotechnology program after completing the health cience core curriculum, the courses that complement the core curriculum and the university eneral education requirements. In the junior year, students follow the prescribed academic pro- ram at Oakland University. The senior year consists of a 12-month internship at either William eaumont Hospital School of Cytotechnology or Harper Hospital School of Cytotechnology. he program includes an integrated presentation of didactic material, microscopic study, specimen reparation, clinical observation, cytogenetics, laboratory management and a research project.

Cytotechnology specialization course requirements

Students accepted into the cytotechnology specialization must complete the following courses: IO 205, 305, 306, 307, 325, 326, 341, 393 and 423; MLS 312; and 28 credits in clinical courses, T 401 and 402.

Specialization in histotechnology

Director: *Abdul Al Saadi*

Histotechnologists perform a variety of diagnostic and research procedures in the anatomic iences. Basic histologic techniques involve the processing and staining of tissue specimens iat have been removed from humans or animals by biopsy or autopsy. Advanced techniques iwolve the use of the electron microscope, immunofluorescence microscopy, autoradiography, ytogenetics and medical photography.

Students may be accepted into the histotechnology specialization after completing the health cience core curriculum, the courses that complement the core curriculum and the university eneral education requirements. In the junior year, students follow the prescribed academic pro- ram at Oakland University. The senior year consists of a 12-month affiliation at William Beau- ont Hospital School of Histotechnology.

Histotechnology specialization requirements

Students accepted into the histotechnology specialization must complete the following ourses: BIO 205, 305, 306, 307, 325, 341, 423 and 429; MLS 312; and 28 credits in clinical ourses, HT 401, 402, 403 and 404.

Specialization in medical technology

Medical technologists perform a wide range of diagnostic procedures, including procedures in hematology, clinical chemistry, microbiology, serology, urinalysis and immunohematology (blood banking).

Students may be accepted into the medical technology program after completion of the health science core curriculum, the courses that complement the core curriculum and the university general education requirements. The junior year consists of the prescribed academic program at Oakland and the senior year consists of a 12-month affiliation at an approved hospital school of medical technology. Upon completion of the internship, the student must pass a national certification examination to become a registered medical technologist.

Currently, the following hospitals are affiliated with Oakland University: Detroit Receiving Hospital, Detroit; Garden City Osteopathic Hospital, Garden City; Harper Hospital, Detroit; Pontiac General Hospital, Pontiac; Providence Hospital, Southfield; St. John Hospital, Detroit; St. Joseph Hospital, Flint; and William Beaumont Hospital, Royal Oak. Internships have also been arranged with other Michigan hospital programs under individually approved agreements.

Medical technology specialization requirements

Students accepted into the medical technology specialization must complete the following courses: BIO 365, 421, 422, 423, 325 and 408 (or CHM 453, 454 and 457); MT 313, 314, 316, 317, 326, 327, 328; and 28 credits in clinical courses, MT 415, 416, 418, 421, 423 and 428.

Specialization in nuclear medicine technology

Medical Director: *Michael M. Joh*

Program Coordinator: *Charlene Rencher*

Nuclear medicine technologists utilize small amounts of radioactive materials for diagnostic evaluations of the anatomic or physiologic conditions of the body and to provide therapy with radioactive sources.

Students are accepted into the nuclear medicine technology program after completion of the health science core curriculum, the courses that complement the core curriculum and the university general education requirements. The junior year consists of the prescribed academic program at Oakland University. The senior year consists of a 12-month affiliation at St. John Hospital School of Nuclear Medicine Technology.

Nuclear medicine technology specialization requirements

Students accepted for nuclear medicine technology major standing must complete the following courses: BIO 325, 381, 423; PHY 158 and one additional physics course (number to be assigned); PHL 318; HS 331, 401; MLS 312; MT 326, 328; 28 credits in clinical courses, MNT 401, 402.

Medical Physics Program

Director: *Abraham R. Liboff*

Associate Director: *Michael Chopp*

The baccalaureate program in medical physics is offered jointly by the School of Health Sciences and the College of Arts and Sciences, Department of Physics.

Medical physics, a developing health-related professional field, is concerned with the use of physical techniques to diagnose and treat disease. In the past, medical physics played a vital part in the development of radiation therapy. Today, it also includes the physical aspects of x-ray diagnosis, nuclear medicine, radiation safety, ultrasonics, lasers, thermography, image intensifica

tion, EKG and EEG. Medical physics is involved in related areas, such as patient monitoring and general medical instrumentation. Much of the progress made in the last decade both in diagnosing and treating cancer can be traced directly to the increasing use of physics in medicine.

In addition to clinical duties surrounding those techniques, medical physicists engage in research and development, consultation and service, and teaching residents, hospital personnel and undergraduate students.

The medical physics program is based on a group of physics courses, with relevant biology, chemistry and mathematics courses added.

In the senior year, students take courses in the physics of diagnostic radiology and the physics of nuclear medicine. In addition, students are placed in hospitals as medical physics interns. During their internships, students assist the resident medical physicists in providing clinical medical physics support, and thereby gain direct experience in a clinical environment.

Students interested in the medical physics program should consult with the associate director for specific information and counseling.

Requirements for the B.S. degree with a major in medical physics

Students seeking the Bachelor of Science degree with a major in medical physics must complete 128 credits through the following requirements:

1. Complete the writing proficiency requirement. Up to seven credits of rhetoric course work may be counted toward the credits required for this degree.
2. Meet the university general education requirements, as detailed on pages 25-28. In completing the health science core curriculum, medical physics majors will automatically satisfy the field groups in mathematics, logic and computer science, and in natural science and technology.
3. Complete the health science core curriculum. For medical physics majors, the following courses within the core curriculum are required: BIO 200, 205, 207; MTH 154; STA 226; and PHY 151-152.
4. Complete MTH 155, MTH 254, APM 257, CHM 149, 4 additional credits in chemistry at a level not below CHM 144 and PHY 158, all of which complement the core curriculum.
5. Complete the courses required for the major, PHY 317, 318, 341, 347, 351, 361, 371, 372, 381, 441, 442, 443 and 444.

Perfusion Technology Program

Program Director: *Harry R. Hoerr, Jr.*

The perfusion technology program is a cooperative program between Oakland University and Psicor, Inc. of Brighton, Michigan. Psicor provides program support in such areas as educational staff, laboratory equipment and supplies and provision of internship sites and clinical instruction. Oakland University remains responsible for the program curriculum, selection of faculty, admission of students, approval of students recommended for degrees and all other aspects of the program concerned with academic standards.

The program in perfusion technology prepares students for careers as the professional members of surgical support teams who are responsible for extracorporeal circulation functions. Perfusion technologists work under the supervision of a physician to select appropriate equipment and techniques during any medical situation where it is necessary to support or temporarily replace a patient's circulatory or respiratory function. In this capacity, perfusion technologists monitor physiological functions and administer prescribed blood products, anesthetic agents or other drugs through the extracorporeal circuit. Perfusion technologists are knowledgeable in the use of a variety of techniques, such as hypothermia and hemodilution, as adjuncts to extracorporeal circulation.

Admission to the professional part of the program is restrictive and selective, and occurs in the winter semester of the sophomore year, either by progression of students currently enrolled

at Oakland University or by transfer from other institutions. Acceptance into the program is contingent upon satisfactory completion of the health science core curriculum, required courses that complement the core curriculum, and a sufficient portion of the university general education program to allow the student to complete the total requirement while completing the professional program.

The perfusion technology program limits each entering junior class to 24 students, with preference to applicants judged to be best qualified to complete the program. Admission is based on grades, letters of recommendation and personal interviews.

Requirements for the B.S. degree with a major in perfusion technology

Students seeking the Bachelor of Science degree with a major in perfusion technology must complete 136 credits through the following requirements:

1. Complete the writing proficiency requirement. In satisfying this requirement, students may need to complete RHT 100 and RHT 101 or their equivalents at another college or university. Credits associated with these courses are not included in the 136 credits required for this degree.
2. Meet the university general education requirements, as detailed on pages 25-28. In completing the health science core curriculum, perfusion technology majors will automatically satisfy the field groups in mathematics, logic and computer science, and in natural science and technology.
3. Complete the health science core curriculum. The biology sequence of BIO 200, 205 and 207 is required for perfusion technology majors.
4. Complete BIO 206 and CHM 203-204, which complement the core curriculum.
5. Complete the major program, including: BIO 325, MT 327; MLS 312 and 318; HS 331, 361, 363 and 401; and PFT 301, 302, 303, 310, 311, 320, 451, 452 and 453.

Academic standing

To be accepted to major standing, students should have at least a 2.50 overall grade point average. Students with lower grade point averages may be admitted to provisional major standing pending completion of fall semester, junior year course work, in which a semester grade point average of 2.50 or higher shall be earned, with no course grade below 2.0.

Probationary status/non-continuation in program

A 2.50 grade point average in the perfusion technology major course work must be maintained. A student falling below 2.50 will be placed on probation with review by the perfusion technology faculty. The review may result in a method of remediation or dismissal from the program.

A final grade below 2.0 in a perfusion technology major course places the student on probation. A method of remediation must be enacted prior to continuance in the program. All courses must be passed in sequence, and no student may advance in the program while on probation. A student earning a grade below 2.0 in two or more perfusion technology major courses cannot continue in the program.

Course Offerings

CYTOTECHNOLOGY

CT 401 Clinical Internship (14)
Microscopic study of cellular alterations indicative of cancer and precancerous conditions, bacterial, viral and parasitic infections, and hormonal abnormalities; cytogenetics; and a research project.

CT 402 Clinical Internship (14)
Continuation of CT 401.

HISTOTECHNOLOGY

HT 401 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 histochemical staining methods and their specific applications.

HT 402 Basic Electron Microscopy (8)
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.

HT 403 Immunohisto-cytochemistry (4)
A course designed to teach basic and advanced procedures of fluorescent and enzyme-labeled antibody techniques. The course includes the preparation of tissues, staining with labeled antibodies and the use of the fluorescence microscope in clinical medicine and research.

HT 404 Cytogenetics (4)
An intensive course in human cytogenetics. Human chromosome methodology, chromosome identification and chromosomal abnormalities and their application in clinical medicine.

MEDICAL LABORATORY SCIENCE

MLS 201 Careers in Medical Laboratory Sciences (0)
An introductory seminar in medical laboratory sciences, including career opportunities in clinical settings (medical technology, histotechnology, cytotechnology, industrial sales and/or research and development, basic medical research, and education). Graded S/U.

MLS 312 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.
Prerequisite: BIO 207 or 321; permission of instructor.

MLS 318 Immunohematology/Hemostasis (2)
Survey of immunohematology and hemostasis for non-medical laboratory sciences majors.
Prerequisite: BIO 207 or 321.

MLS 405 Special Topics (1, 2, 3 or 4)
Prerequisite: Permission of instructor.

MLS 451 Clinical Education (6)
Prerequisite: Permission of instructor.

MLS 490 Individual Laboratory Work (2, 3, 4)
Prerequisite: Permission of instructor.

MLS 497 Apprentice College Teaching (2)
Directed teaching of selected undergraduate courses. May be repeated for credit. Graded S/U.
Prerequisite: Permission of instructor.

MEDICAL TECHNOLOGY

MT 313 Immunohematology (2)
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. Laboratory included.
Prerequisite: BIO 207 or 321; permission of instructor.

MT 314 Hemostasis (2)
In depth study of the basic physiology and pathophysiology of the human hemostatic system. Laboratory included.
Prerequisite: BIO 207 or 321; permission of instructor.

MT 316 Medical Hematology (4)
Theory and techniques in hematology, including red blood cell, white blood cell and platelet morphogenesis, physiology, and pathophysiology.
Prerequisite: BIO 207 or 321; permission of instructor.

MT 317 Hematology Laboratory (1)
To accompany MT 316.
Prerequisite: Permission of instructor.

MT 326 Instrumentation and Analytical Concepts (2)
An introduction to the theoretical and practical aspects of clinical instrumental analysis. Includes practical experience in the calibration, operation, and preventive maintenance of laboratory instruments. Laboratory included.
Prerequisite: Permission of instructor.

MT 327 Clinical Chemistry (3)
A theoretical introduction to the fundamentals of clinical chemistry with emphasis on pathophysiology and clinical correlations.
Prerequisite: BIO 325.

MT 328 Clinical Chemistry Laboratory (1)
Provides practical experience in the application of clinical instrumentation and current clinical methodologies to the performance of clinical chemistry assays.
Prerequisite: Successful completion of MT 326 with grade of 2.0 or better.

MT 415 Clinical Practicum — Urinalysis/Coagulation (3)
Didactic and practicum experience at an affiliated hospital school of medical technology, in the fields of urinalysis and coagulation.
Prerequisite: Permission of instructor.

MT 416 Clinical Practicum — Hematology (5)
Didactic and practicum experience at an affiliated hospital school of medical technology, in the area of hematology.
Prerequisite: Permission of instructor.

MT 418 Clinical Practicum — Immunohematology (4)
Didactic and practicum experience at an affiliated hospital school of medical technology, in the field of immunohematology.
Prerequisite: Permission of instructor.

MT 421 Clinical Practicum — Microbiology (7)
Didactic and practicum experience at an affiliated hospital school of medical technology, in the field of medical microbiology, including parasitology and mycology.
Prerequisite: Permission of instructor.

MT 423 Clinical Practicum — Serology (2)
Didactic and practicum experience at an affiliated hospital school of medical technology, in the field of serology.
Prerequisite: Permission of instructor.

MT 428 Clinical Practicum — Chemistry (7)
Didactic and practicum experience at an affiliated hospital school of medical technology, in the field of clinical chemistry.
Prerequisite: Permission of instructor.

NUCLEAR MEDICINE TECHNOLOGY

NMT 401 Clinical Internship I (14)
Prerequisite: Permission of instructor.

NMT 402 Clinical Internship II (14)
Continuation of NMT 401.

PERFUSION TECHNOLOGY

PFT 301-303 Perfusion Technology Seminar (2 each)
Introduction to perfusion technology including such topics as: role, operating room environment, aseptic techniques, and blood handling and processing.

PFT 310 Principles of Perfusion Technology (5)
Components of extracorporeal circuit, relationship between circuit and patient, gas transfer, filter theory and design, cardiovascular fluid dynamics, hemodilution, hypothermia, myocardial protection and pediatric perfusion.

PFT 311 Perfusion Technology Laboratory (3)
Laboratory to accompany PFT 310.
Corequisite: PFT 310.

PFT 320 Perfusion Monitoring Systems (4)
Biomedical monitoring systems for cardiac patient care and surgery; systems functions, reliability and maintenance; basic principles of electronics.
Prerequisites: HS 331 and 363.

PFT 451-453 Clinical Education I-III (6 each)
Didactic and practicum experience at an affiliated hospital. Each practicum runs 12 weeks and is at a different hospital.
Prerequisites: PFT 310, 311 and 320.

OTHER ACADEMIC PROGRAMS

Health Behavioral Sciences Program

Director: *Carl R. Vann*

Professors: *Philip Singer, Carl R. Vann*

Visiting associate professor: *Robert W. Jarski*

Clinical professor: *Daniel E. DeSole*

Clinical associate professor: *Ruben S. Kurnetz*

Clinical assistant professors: *Michael N. Musci, Anthony R. Thersigni*

Courses in health behavioral sciences are recommended as electives for students pursuing degree programs offered by the School of Health Sciences. Students interested in a program in health services administration should consult the Department of Political Science in order to combine courses in health behavioral sciences with a program in public administration.

Concentration in Health Behavioral Sciences

The concentration in health behavioral sciences should be taken in conjunction with a regular departmental major or independent major. Its purpose is to offer a multidisciplinary perspective of the behavioral sciences on the many and varied aspects of the health disciplines, problems and concerns. It provides a cross-cultural as well as an American perspective. It is especially relevant to students seeking careers in health-related fields and it offers significant insights and opportunities for study to students pursuing programs in general education, administration and law.

The requirement for the concentration in health behavioral sciences is successful completion of 20 credits, chosen from: HBS 200, 250, 251, 300, 400 and 499; AN 333 and 420; ECN 467; PS 359; PA 568 and 569; and SOC 368.

Students in the premedical program and majors in any of the natural sciences may, with an adviser's approval, count 4 credits of their major course work toward this concentration.

Course Offerings

HBS 200 Health Care Dimensions (4)
Development, present status, and dynamics of the American health care system emphasizing structure of the various health professions and the problems, opportunities, and constraints of health care delivery, and professionalism. Other topics are relationships between the health care cultures and personality and professional roles of health care practitioners, and issues involving hospitals and health care.

HBS 250-251 Health Behavioral Sciences (4 each)
Human behavior, institutions, and professions in the health-medical fields. Emphasis on concepts of health and illness, death and dying, the sick role, doctor-patient relationships, organization and delivery of health care.

HBS 300 Independent Study in the Health Behavioral Sciences (4, 8, 12 or 16)
A semester of off-campus independent study and applied research. Projects are developed with and supervised by faculty within the framework of methodology and explanation in the behavioral sciences.

HBS 359 Public Policy and Health Care (4)
An examination of the status and evolution of public policies relating to health and health care, the policy-making processes in health care and the various implications of trends in health care policy. Identical with PS 359.

HBS 400 Field Practicum in Health Behavioral Sciences (4, 8, 12 or 16)
Primarily for students seeking careers in health-related fields, this course is a supervised field placement combined with academic content and individually guided research. Students are placed with hospitals, government and voluntary health agencies, comprehensive medical service organizations, etc.

HBS 499 Senior Seminar in Health Behavioral Sciences (4)

Industrial Health and Safety Program

Program director: *Uwe Reischl*

Associate professor: *Use Reischl*

Assistant professor: *Richard Rozek*

Clinical associate professor: *Joseph P. Chu*

Clinical assistant professors: *Joseph A. Calcaterra, Daniel Fink, May C. Ng, David S. Sugano*

The Bachelor of Science degree program in industrial health and safety addresses the interests and aspirations of students seeking responsible involvement in the field of occupational health and safety. State-of-the-art concepts in industrial hygiene and occupational safety are presented with relevant exposure to the basic physical, chemical, biological and behavioral science disciplines. The program is multidisciplinary in nature and provides advanced specialized perspectives in the form of three course groupings: physical/life science, social/behavioral science and work organization.

The curriculum is designed as a four-year baccalaureate program. However, students can obtain certificates after completing the industrial health and safety core sequence of courses. This normally involves the successful completion of the first four semesters of course work.

A one-semester internship is required for both the certificate and the Bachelor of Science degree. This internship provides first-hand field experience in the practice of industrial hygiene and occupational safety. Internship placements will be the responsibility of the program and will include labor, industry and government settings.

Graduates of the program will find employment opportunities within industry, labor, and local, state and federal health agencies. Many courses in this program are scheduled in the evening to accommodate part-time students.

Requirements for the Bachelor of Science degree with a major in industrial health and safety

Students seeking the Bachelor of Science degree with a major in industrial health and safety must complete 136 credits through the following requirements:

1. Complete the writing proficiency requirement. Up to six credits of rhetoric course work may be counted toward the credits required for this degree.
2. Meet the university general education requirements, as detailed on pages 25-28. In completing the health science core curriculum, industrial health and safety majors will automatically satisfy the field groups in mathematics, logic and computer science, and in natural science and technology.
3. Complete the health science core curriculum. The biology sequence of BIO 200, BIO 205 and BIO 207 is preferred.
4. Complete CHM 203-204 and PHY 158, which complement the core curriculum.
5. Complete the major courses: HS 201 (or IHS 100 and IHS 110), and IHS courses numbered 201, 202, 211, 212, 303, 304, 330, 420 and 440.
6. Complete HST 302.
7. Earn 16 credits in one of the three perspective options: physical/life science, social/behavioral science, or work organization. Perspective courses may not be counted toward both the general education requirements and this requirement.

Industrial health and safety program perspectives

As a requirement for the Bachelor of Science degree in industrial health and safety, students must successfully complete 16 credits in one of three perspective options. Twelve or more of the credits must be in courses at the 300-level or above. (This, along with the 20 credits of 300-level or above courses required in the curriculum, satisfies the university requirement of completing 32 credits at the 300-level or above.)

The option programs are designed to be flexible. The School of Health Sciences continuously revises the list, with close consultation of the involved areas. Introductory (100-level) courses listed in options B and C may be waived for some students who have demonstrated preparation for upper-level courses.

Students should seek an adviser's counseling and guidance when selecting a program perspective and when planning the courses to fulfill the requirement.

Option A: Physical/life science perspective: Choose from BIO 319, BIO 325, BIO 341, EXS 304, CHM 225, ENV 308, ENV 312, ENV 355, ENV 372, ENV 373, ENV 390, ENV 461, ENV 484, ENV 486, PHY 241, PHY 242, PHY 243, CSE 125, IHS 313, IHS 421, IHS 450, IHS 451, IHS 452 and IHS 453.

Option B: Social/behavioral sciences perspective: Choose from HBS 400, AN 333, AN 392, AN 420, PSY 100, PSY 350, PSY 351, PT 324, CSE 125, SOC 100, SOC 345 and SOC 357.

Option C: Work organization perspective: Choose from ECN 150, ECN 309, ECN 310, ECN 326, ECN 328, ECN 338, ECN 347, ORG 330, PS 350, IHS 431 and CSE 125.

Grade point policy

Industrial health and safety majors must achieve minimum course grades of 2.0 in required IHS courses. A final course grade below 2.0 places a student on probation, which requires a meeting with the program director or his 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.

Certificate option

A certificate in industrial health and safety may be issued to students who complete the core sequence and basic science courses. A minimum of 68 credits must be completed, including the following courses: HS 201 (or IHS 100 and IHS 110), IHS 201, IHS 202, IHS 211, IHS 212, IHS 240, IHS 304, MTH 141, CHM 144-145, PHY 101, PHY 102, PHY 158, RHT 100 and RHT 101.

Minor in industrial health and safety

Students seeking the Bachelor of General Studies who complete the requirements for the certificate option in industrial health and safety are eligible to receive a minor in industrial health and safety. Students should apply for this minor with forms available from the general studies office.

Course Offerings

IHS 100 Industrial Hygiene I (4)

Introduction to current concepts and issues in industrial hygiene and occupational health. Principles of recognition, evaluation, and control of hazards in the work environment. Environmental standards, environmental and biological monitoring, OSHA, worker productivity, threshold limit values.

IHS 110 Industrial Safety I (4)

Introduction to current concepts in safety engineering. OSHA standards, human factors, accident investigation techniques, fault-tree analysis, legal aspects of safety.

IHS 201 Industrial Hygiene II (4)
Methods of environmental testing. Evaluation of occupational stresses found in selected work environments. Noise, heat, ventilation, microwave radiation, ionizing radiation, illumination. The role of labor and management in controlling environmental quality.
Prerequisites: IHS 100 or HS 201, CHM 144.

IHS 202 Industrial Hygiene III (4)
Advanced methods of environmental testing. Focus on air contaminants in the work environment. Analysis of toxic fumes and gases, dusts, and fibers. Analytical techniques for laboratory and field applications.
Prerequisites: IHS 100 or HS 201, CHM 145, MTH 141 or 154.

IHS 211 Industrial Safety II (4)
Safety assessment for occupational environments. Analytical techniques. structural analysis, strength of materials, electrical safety, fire life-safety, medical management of injuries, personal protective clothing.
Prerequisite: IHS 110 or HS 201.

IHS 212 Industrial Safety III (4)
Introduction to concepts in security and protection of property, disaster response planning, hazardous materials handling during transport. Safety planning and management. Report preparation, writing, and oral presentations.
Prerequisite: IHS 110 or HS 201.

IHS 240 Industrial Health and Safety Internship (4)
Practical training and field exposure to industrial work settings. Intended only for students seeking the certificate in IHS.
Prerequisite: Departmental permission.

IHS 303 Industrial Toxicology (3)
Introduction to the basic concepts and techniques of toxicology with special attention given to industrial work environments. Evaluation of the effects of toxic substances on the human body. Focus on responses of various systems within the body to selected toxic agents.
Prerequisites: IHS 202, CHM 204, BIO 207.

IHS 304 Introduction to Epidemiology (3)
An introduction to the uses of epidemiology in public health practice, using selected diseases to illustrate the development of knowledge on disease causation and the application of such knowledge to disease control.
Prerequisite: IHS 202.

IHS 312 School Safety and Health (2)
Analysis of accident causation and prevention in school facilities. Study of federal, state and local codes which apply to safety and health in schools. Review of concepts, methodology and procedures for assessment of safety and health hazards in school science laboratories and vocational education and training facilities. Identical with VTE 312.
Prerequisite: Departmental permission.

IHS 313 Fire Prevention and Protection (2)
Fundamentals of flame generation and propagation; fire behavior in open and confined spaces; theory of fire fighting methods; methods and devices for fire detection and suppression.
Prerequisites: IHS 202, IHS 212.

IHS 330 Environmental Standards (3)
Examines ambient and work place air, noise, radiation, water and pesticide 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.
Prerequisites: IHS 202, IHS 212, PHY 102, PHY 158.

IHS 403 Industrial Toxicology II (3)
Detailed discussions on how various environmental and industrial toxicants affect animal models and humans. Major areas of concentration will center around environmental pollutants, industrial chemicals, solvents, and metals, and how various systems within the body respond to these toxic agents.
Prerequisite: IHS 303.

IHS 405 Special Topics (2, 3 or 4)
Prerequisite: Permission of instructor.

IHS 420 Public Health Engineering (3)
Planning, design, and survey of factors related to the physical aspects of environmental health with particular reference to industrial pollution control for water and air, waste, and life-safety in buildings.
Prerequisites: IHS 202, CHM 144, MTH 141 or 154.

IHS 421 Human Factors in Lighting (2)
Presents information related to the basic science of light and vision with emphasis on the relationship between light and work. The course is designed to provide knowledge of lighting fundamentals and to provide lighting design skills relevant to industrial work settings.

IHS 431 Regulatory Aspects of Safety (3)
Survey of regulatory basis of accident prevention requirements; federal laws, codes, standards, court judgments, and procedures; case studies; worker influences.
Prerequisites: IHS 212, IHS 330.

IHS 440 Advanced Industrial Health and Safety Internship (4)
Field training in industrial safety and health in close collaboration with professional industrial hygiene and safety personnel. Exposure to health and safety program planning and evaluation. Graded S/U.
Prerequisite: Departmental permission.

IHS 450 Robotic Safety (2)
Information and issues related to worker safety in industrial environments where robots are used will be presented. 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: Departmental permission.

IHS 451 Industrial Ventilation (2)
Design and control applications for reducing worker exposure to airborne contaminants. Concepts and principles of dilution and local exhaust ventilation will be presented. Methods for assessment of industrial ventilation systems required to prevent the accumulation of flammable or explosive concentrations of gases, vapors, or dusts.
Prerequisite: Departmental permission.

IHS 452 Industrial Noise Control (2)
Concepts in engineering controls required in the management of noise overexposure in industrial environments. Analysis of engineering design options and mechanical modifications effective in controlling worker exposure to undesirable industrial noise will be presented.
Prerequisite: Departmental permission.

IHS 453 Radiation Safety (2)
Safety aspects of occupational hazards associated with the use of ionizing radiation in industry will be presented. 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.

IHS 490 Independent Study (1, 2, 3 or 4)
Student initiated and problem-oriented independent study focusing on occupational health and safety issues. Graded S/U.
Prerequisite: Departmental permission.

SCHOOL OF HUMAN AND EDUCATIONAL SERVICES

Dean: *Gerald J. Pine*

Office of the Dean: *Donald M. Miller, associate dean; Nancy Collins, coordinator, advising center; Jean Goebel, adviser; Jean Kirsch-Sullivan, administrative assistant to the dean*

Continuum Center: *Elinor Waters, director; Roberta "Jeff" Daily, coordinator of volunteers; Jane Goodman, associate director; Judith Hoppin, counselor/trainer; Nancy Schochetman, counselor/trainer; Mary Lou Stone, coordinator, Older Adult Project*

Ken Morris Labor Studies Center: *David Cooper, director; Dee Lyons, assistant director; Joseph Bosbous, program specialist, Health and Safety Program; Irene Lopez, program specialist, Union Minorities/Women Leadership Training Project; Symantha Myrick, program specialist; Victor Negrete, program specialist; James Pauley, assistant administrator, Union Minorities/Women Leadership Training Project*

Lowry Early Childhood Center: *Gerald G. Freeman, director; Stephanie C. Riley, program coordinator*

Office of Research and Development: *Edward A. Bantel, co-director; Donald M. Miller, co-director*

Office of School and Field Services: *Harry T. Hahn, director; Geraldine Palmer, coordinator*

Resource Center; *Laura Snider-Feldmesser, director*

Professors: *Edward A. Bantel, Jane M. Bingham, Harold C. Cafone, George E. Coon, Ronald L. Cramer, Gerald G. Freeman, Sidney W. Graber, Harry T. Hahn, W. Dorsey Hammond, James W. Hughes, Jacqueline I. Lougheed, Donald M. Miller, William F. Moorhouse, Gerald J. Pine, Roderic E. Righter, Howard H. Splete*

Associate professors: *John W. Atlas, Richard F. Barron, Gloria T. Blatt, Marc E. Briod, Robert W. Brown, Robert J. Christina, F. James Clatworthy, Anne Cairns Federlein, William C. Fish, Patrick J. Johnson, William H. Jones, David P. Meyer, Billy Jo Minor, Mary L. Otto, Robert G. Payne, James C. Schmidt, Robert M. Schwartz, Ronald M. Swartz, Carol A. Swift*

Assistant professors. *L. DiAnne Borders, David C. Housel, Anne P. Jaworski, John Orehovec, Lou Ellen Ramey*

Adjunct associate professors: *Jeffery A. Kottler, Elinor Waters*

Board of Visitors

The Board of Visitors of the School of Human and Educational Services is composed of outstanding leaders in the field of education and human services. The Board of Visitor's role is to advise and counsel the dean and faculty of the school. The board also assists the school in providing programs responsive to the learning and training needs of the public schools and human service agencies as they cope with changing society in the complex technological and diverse culture of southeastern Michigan.

Members of the Board of Visitors are:

Lillian Bauder, president, Cranbrook Educational Community
Edwin Crandall, consultant, Rochester Community Schools
Beverly Geltner, associate superintendent, Southfield Public Schools

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Dana Whitmer, special assistant to the president, Oakland University
Charles T. King, professional development/human rights department, Michigan Education Association

Continuum Center

The Continuum Center is an adult counseling center that assists men and women of all ages in personal exploration and planning. Workshops for personal, career and professional development are offered, as well as individual counseling. Workshops and training in such areas as assertiveness training, career or retirement planning and communications also are offered on a contractual basis.

Lowry Early Childhood Center

The Lowry Early Childhood Center provides care to young children, toddlers through kindergarten-age. The center is a research facility for students and faculty concerned about child growth and development. It is a training site for students enrolled in the School of Human and Educational Service human development and child studies programs.

Ken Morris Labor Studies Center

The Ken Morris Labor Studies Center sponsors daytime and evening courses for union members and the general public in both on- and off-campus locations. It also offers occasional residential conferences. A special leadership training program for union minorities and women and a health and safety program are supported by state grants.

Office of Research and Development

The Office of Research and Development facilitates action research and professional development conducted in collaboration with schools, school districts, education service agencies and other institutions and organizations. Field-based studies on teaching and learning are carried out in cooperation with school building and program teams at the preprimary, elementary and secondary school levels. Examinations are made of alternative practices in instruction, curriculum and professional development. Outstanding practitioners are occasionally affiliated as teacher-researchers for selected studies and projects.

Office of School and Field Services

The Office of School and Field Services is responsible for the coordination of all off-campus sections of graduate education courses, as well as the placement of pre-service interns and special education practicum students. Special credit offerings, educational forums and conferences also are coordinated through this office.

Resource Center

The Resource Center provides support for the academic, research and development activities of the School of Human and Educational Services. Patrons are provided with a functional set-

ting for the examination, study, research, development, production and evaluation of instructional materials and technologies. Workshops, seminars and consultation services in instructional technology are available.

Graduate Studies

The School of Human and Educational Services offers programs leading to the Doctor of Philosophy in reading, the Education Specialist in education administration, the Master of Arts in counseling, and the Master of Arts in Teaching in four areas: early childhood; curriculum, instruction and leadership, reading and language arts education; and special education.

In addition, programs leading to Master of Arts in Teaching degrees in mathematics and English are offered jointly by the School of Human and Educational Services and the College of Arts and Sciences. The School of Economics and Management also offers a Master of Business Administration degree for superior undergraduate students in any major. Oakland University undergraduate students studying for a major in an area other than management may earn both an undergraduate degree and the M.B.A.

For information on these programs, see the *Oakland University Graduate Catalog.*

Undergraduate Curriculum

The School of Human and Educational Services offers programs designed to prepare students for careers in teaching and related human service activities. The programs include a Bachelor of Science in elementary education, teaching certification for secondary education in social studies or music, and a Bachelor of Science in human resources development with specialization in human development and child studies, youth and adult services, and training and development.

Advising

All students must meet with an adviser to plan their programs. The Elementary Education and Secondary Social Studies Advising Office is in 402 O'Dowd Hall, 370-4182. The Human Resource Development Advising Office is in 137 O'Dowd Hall, 370-3066 or 370-4170.

The elementary education program

The elementary education program enables students to secure Michigan teaching credentials that certify them to teach all subjects in grades K-8 and the ninth-grade subject areas of students' major or minor fields.

The program is approved by the National Council for Accreditation of Teacher Education (NCATE).

A suggested sequence for freshmen planning to major in education follows:

Fall semester: RHT 100, MTH 111,* general requirement in international studies, ALS 176.
Winter semester: RHT 101, MTH 112,* general requirement in fine arts, and one of ENG 100, ENG 224 or ENG 241.

*See information concerning these courses on page 97.

Admission to the major

Application for admission to the elementary education major occurs during the fall or winter semester of the pre-elementary (sophomore) year. Students wishing to be considered for admission must file an application with the Department of Curriculum, Instruction and Leadership. Students seeking admission also will be required to take the Pre-professional Skills Test prior to admission. Candidates should contact the Department of Curriculum, Instruction and Leadership for the scheduled testing times during the semester they file their applications.

Minimum criteria for admission to the elementary education program:

1. Admission to and retention in Oakland University.
2. Minimum grade point average of 2.50 in non-professional course work.
3. Completion of ED 110, ED 210, ED 215 and SCS 105, with a minimum grade of 2.8 in each course. However, because space in the program is limited, a 2.8 grade point does not guarantee admission.
4. Results of the Pre-professional Skills Test must be on file.
5. Completion of an application for major standing.

Continuation in the major

Once admitted to the major, a student is considered a pre-service teacher.

Minimum criteria for continuation in the elementary education program:

1. Students are expected to demonstrate the characteristics of and to conduct themselves as members of the teaching profession.
2. Students must earn a minimum grade of 2.8 in each professional course.

Requirements for the Bachelor of Science degree in elementary education

To earn a Bachelor of Science degree with a major in elementary education, students must:

1. Complete 124 credits.
2. Complete at least 32 credits at Oakland University.
3. Complete at least 32 credits in courses at the 300-level or above.
4. Take at Oakland University the last 8 credits needed to complete the baccalaureate degree requirements.
5. Have a cumulative grade point average of at least 2.50.
6. Satisfy the writing proficiency requirement as described on page 25.
7. Complete the university general education requirement of 32 credits, as described on pages 25-28.
8. Be in substantial compliance with all legal curricular requirements.
9. Complete or place out of by examination MTH 112*; pass the School of Human and Educational Services writing competency exam.
10. Complete a professional program of 54 credits.
11. Complete a major concentration of 36 credits or two minor concentrations of 24 credits each in a field outside education.
12. Complete ED 455.
13. Complete a media competency requirement.

* See information concerning this course on page 97.

Additional general education requirements for elementary education majors

Within the mathematics field group for general education credits, students seeking elementary certification must take one course listed plus an additional course approved by the academic adviser. All of these courses carry a prerequisite proficiency in algebra at the same level as MTH 111* or MTH 112.* An examination must be taken to demonstrate proficiency or the appropriate prerequisite class must be taken, with the credit not counting toward minimal graduation requirements.

Within the natural sciences field group for general education credits, students seeking elementary education certification must take BIO 300 or an equivalent approved by the academic adviser.

In addition, students must take SCS 105 prior to admittance to the School of Human and Educational Services.

* See information concerning these courses on page 97.

Professional program courses

Courses offered as part of the professional program are: ED 110, ED 210, ED 215, ED 302, ED 331, ED 333, ED 354, ED 355, ED 396, ED 414, ED 420, ED 455, ED 163, SCS 305 and SS 470.

Majors and minors

One major or two minors are required as part of the elementary education program. Group majors (36 credits) and minors (24 credits) are offered in fine arts, history/social science, language arts, modern language, science. A major (30 credits) and minor (20 credits) also are offered in math.

Lists of approved courses are available in the education advising office, 402 O'Dowd Hall.

Teaching Certification for Secondary Education

Students interested in a secondary teaching major should consult the chair or chief adviser of the major department in which they are interested.

At present, the College of Arts and Sciences offers Bachelor of Arts degrees with certification for secondary teaching credentials provided by the School of Human and Educational Services in two areas: social studies and music.

Teaching minors are available in the following subject areas: biology, chemistry, English, history, mathematics, modern languages, music, physics, political science, psychology, science, social studies, sociology, speech (see communication arts).

NOTE: Teaching minors in political science, psychology and sociology are available for social studies majors only.

Sponsorship for Michigan Teacher Certification

The Michigan Department of Education certifies teachers in the state. It issues provisional certification to candidates deemed qualified by colleges and universities. This provisional certificate can be converted to a continuing certificate after a period of teaching and additional studies. (For information, see the *Oakland University Graduate Catalog.*)

Oakland University sponsors its graduates for the provisional elementary and provisional secondary certificates when certain requirements are met.

The requirements for sponsorshop for the provisional elementary certificate are the same as the degree requirements for a Bachelor of Science in elementary education. Further, students must complete ED 455 (internship) with a grade of 2.5 or better.

The requirements for sponsorship for the secondary certificate in social studies or music follow: Students must complete a university baccalaureate degree with an approved teaching major and one approved teaching minor, as well as successfully complete ED 110, ED 344, ED 345, ED 338, ED 427 and ED 428. Social studies majors must also complete ED 370 and ED 354. Further, all students must complete ED 455 (internship) with a grade of 2.5 or better.

Human Resources Development

The School of Human and Educational Services offers a program in human resources development (HRD) leading to a Bachelor of Science degree.

This program prepares students for service-action careers related to human problems, services and social change. It provides students with an opportunity to acquire knowledge and skills usable in a wide range of human service activities. Students may select a major specialization in youth and adult services, training and development or human development and child studies.

A primary goal of the program is to develop potential leaders who have the analytic abilities, communication and organization skills, and experimental know-how to respond to human needs

in an era of rapid social change. The basic approach to the program is joining understanding, skills and service. Problem-solving and decision-making abilities are developed through field experiences and on-the-job internships.

Requirements for the Bachelor of Science degree in human resources development

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

1. Complete 124 credits.
2. Complete at least 32 credits at Oakland University.
3. Complete at least 32 credits in courses at the 300-level or above.
4. Take at Oakland University the last 8 credits needed to complete the baccalaureate degree requirements.
5. Have a cumulative grade point average of at least 2.50.
6. Satisfy the writing proficiency requirement as described on page 25.
7. Complete the university general education requirement of 32 credits, as described on pages 25-28.
8. Be in substantial compliance with all legal curricular requirements.
9. Complete a specialization of at least 64 credits in human development and child studies, training and development, or youth and adult services. The specialization must consist of: 24-32 credits in a specified core of courses; 24-28 credits in supporting cognate courses; and 8-12 credits in internships.
10. Complete 20-28 credits in elective courses.

Specialization in human development and child studies

Coordinator: *Edward Bantel*

Committee: *Anne Federlein, Gerald Freeman*

The human resources development degree program with specialization in human development and child studies develops competencies for design, evaluation and licensure of child care facilities and direction of child care centers, family and day care and group day care homes. The program also provides education for training parents and paraprofessionals in the care and education of young children, as well as for dealing effectively with young children and their development in a variety of settings.

Requirements for admission to the specialization

Students may apply for admission to the human development and child studies program after satisfactory completion of ED 220 and ED 221. To be admitted, students must have a grade point average of at least 2.50 for a minimum of 16 graded credits and a minimum grade of 2.5 in ED 220 and ED 221. Courses that carry no numerical or letter grades are excluded from the calculation of the grade point average.

Students who wish to enter the program but whose grade in ED 220 or ED 221 is lower than 2.5 must repeat the course and earn at least a 2.5 before applying for admission to the program. ED 220, ED 221 and admission to the program are prerequisites for all other human development and child studies courses.

Specialization course requirements

Students seeking a specialization in human development and child studies must:

1. Earn 30 credits in a specified core of courses, including ED courses numbered 220, 221, 223, 224, 225, 320, 324, 325 and 326;
2. Earn 24 credits in cognate courses including a) PSY 271 and one course chosen from AN 305, PSY 326, SOC 335 or a family-oriented social science course; and b) additional courses

related to the development of children, selected with adviser assistance; suggested choices are ED 320 or ED 450.

3. Earn 12 credits of internship by successfully completing ED 456. The internship may not be taken with any other courses.

Requirements for continuation in the specialization

Grades in courses submitted for credit in the human development and child studies program must be 2.0 or better. To continue in the program, students must maintain a minimum overall grade point average of 2.50. Students whose grades fall below the minimum may request a review by the specialization faculty before registering for the next semester. Students who do not request a review will be dropped from the program.

Students will not be permitted to register for the internship unless they have attained a minimum overall grade point average of 2.50 at the time of application and have completed all the specialization courses. Students who do not meet this requirement may request a review by the early childhood faculty before registering for student teaching.

Specialization in youth and adult services

Coordinator: *Luellen Ramey*

Committee: *Billy Minor, John Atlas*

This specialization has been developed in cooperation with agency and industry employers in the community. It prepares students for a wide variety of human service occupations in such fields as employment and training, probation and corrections, guidance, mental health, substance abuse, youth or family services and services for older persons.

Students develop helping profession competencies through human interaction courses, special topic courses in human resources development and field experiences, culminating in the internship.

Requirements for admission to the specialization

Students may apply for admission to the youth and adult services program after satisfactory completion of at least 32 semester hours of credit at an accredited college or university with a grade point average of 2.50 or better. Courses that carry no numerical or letter grades (such as S or U) are excluded from the calculation of the grade point average. Before applying, students must also have completed HI 261 or an equivalent course, HI 361 and HI 363 with a minimum grade of 2.5 in each course.

Before completing the above requirements, students may enroll as pre-HRD majors. Grades in courses submitted for credit in the specialization in youth and adult services must be 2.0 or better.

To continue in the program, students must maintain a minimum overall grade point average of 2.50.

Specialization course requirements

Students seeking a specialization in youth and adult services must:

1. Earn 32 credits in core courses, including HI 261, HI 360, HI 361, HI 363, HRD 362 and 16 credits in other HI or HRD courses.
2. Earn 22-24 credits in cognate courses at the 200-level or above, including a) two advanced courses in psychology, sociology or anthropology; b) a course dealing with social change chosen from: HRD 401, ECN 309, ECN 338, PS 305, SOC 205, SOC 314, SOC 336, SOC 346, SOC 460 and SOC 350; c) a course in research, evaluation or statistics chosen from: HRD 402, PSY 250, PSY 311, SOC 202 or SOC 203 (those who intend to pursue a Master of Social Work degree should consult with an HRD adviser regarding cognate statistics requirements); d) remaining advanced courses in behavioral science chosen from: GRY 400, HRD 301, HRD

302, SCN 114, SCN 115, WS 300, WS 400 or a course in economics, management, organizational behavior, health behavioral sciences, political science, psychology, sociology/anthropology, or speech communication.

3. Earn 8 or 12 credits of internship by successfully completing HRD 490 during one semester of the senior year.

Specialization in training and development

Coordinator: *Robert Payne*

Committee: *James Clatworthy, David Meyer*

Training and development is the process of systematically developing human resources within a work organization to create motivation and increase efficiency. The specialization in training and development requires course work in behavioral sciences, human relations, training and program delivery. These courses provide preparation for a variety of careers in government, health and human services, and in business and industry.

An internship during one semester of the senior year provides work experience in an appropriate setting.

Requirements for admission to the specialization

Students may apply for admission to the training and development specialization after completion of a minimum of 32 semester hours of credit at an accredited college or university with a minimum grade point average of 2.50; completion of HI 360 and HI 361 or HI 363 with a minimum grade point average of 2.50; and completion of the university writing proficiency requirement.

Before applying for admission, students may enroll as pre-HRD majors. Grades in courses submitted for credit towards the specialization must be 2.0 or better. To continue in the program, students must maintain an overall grade point average of 2.50 or better.

Specialization course requirements

Students seeking a specialization in training and development must:

1. Earn 24 credits in core courses, including one in each of the following six categories: a) human relations and effective interaction (prerequisite: HI 261 or equivalent): HI 360 and HI 361 or HI 363, HI 461 or HI 463; b) assessment of individuals: HRD 362 or PSY 311; c) adult learning theory and design of training programs: HRD 310; d) career development: HRD 364, HRD 467, HRD 469 or SOC 455; e) adult instruction: HRD 420 and HRD 421 or HRD 422; f) human development process: HI 464, HRD 368, HRD 369 or HRD 440.
2. Earn 22-24 credits in cognate courses. The requirement may be satisfied by completing a minor in management (22 credits) or by earning one course in each of the following six categories (24 credits): a) writing skills for instruction: RHT 335 (ENG 482 may be substituted when RHT 335 is not offered); b) organizational theory: HRD 401, ORG 330, ORG 331 or ORG 334; c) economics: ECN 150, ECN 200, ECN 201, ECN 338 or ECN 468; d) planning and evaluation: HRD 402, HRD 390, PSY 250, SOC 202 or SOC 203; e) labor relations and employee involvement: MGT 433, HRD 467, HRD 469, HST 302, SOC 350, SOC 354, SOC 357 or PHL 316; f) computer literacy: CSE 125, CSE 130 or ED 396.
3. Successfully complete an 8- or 12-credit internship, HRD 490, during one semester of the senior year.
4. Earn 8-10 additional credits, to make a total of 64 credits for the specialization in training and development. The credits must be in additional courses chosen from the following categories: a) any course that counts toward the requirements for a minor in management; b) any course listed above under either the cognate or core courses; c) any additional course up to the approved maximum in HRD 369, HRD 390 or HRD 490; d.) any HI or HRD course.

Occupational/technical education within the training and development specialization

Coordinator: *William Moorhouse*

Committee: *Robert Payne, Roderic Righter*

Approval is pending for Oakland University to recommend Bachelor of Science candidates majoring in human resources development for teacher certification in occupational/technical areas. Applications for admission will be considered only upon approval of this program; however, guidelines for admission and certification appear below.

Admission to candidacy for teacher certification in an occupational/technical area is selective. Students seeking candidacy must:

1. Earn a minimum cumulative grade point average of 2.50 in courses taken at Oakland University and all previous colleges or universities.
2. Complete, at an accredited college, an associate degree that includes 50 semester-hour credits in an occupational/technical area.
3. Submit a written statement that describes the student's: a) successful work experience in the occupational/technical specialty; b) experience in teaching or in the design or delivery of training to others, including on-the-job training; c) other preparation in the occupational/technical specialty.
4. Submit two or more references from experts in an occupational/technical area attesting to the applicant's high competency in that area.

Occupational course credit and experience

Candidates for certification in an occupational/technical area may apply the 50-credit occupational/technical content area in lieu of the cognate course requirement and elective courses. Candidates must present verification of two years of work experience in a related occupational area, or must complete a planned equivalent program through registration in VTE 401.

Occupational/technical education core courses

The following courses are required and may be applied as substitutions for certain requirements within the specialization in training and development, as approved by an HRD adviser: ED 338, ED 355, VTE 300, VTE 310, VTE 312, VTE 420, VTE 421 and VTE 490.

Minor in Human Resources Development

Coordinator: *David Meyer*

The School of Human and Educational Services offers a minor in human resources development for students who wish to combine their majors with an introduction to human interaction skills and knowledge and techniques in human resources development.

To obtain a minor in human resources development, students must earn at least 24 credits in human interaction (HI) and human resources development (HRD) courses, including a minimum of 8 credits in each area; the plan of study must be subject to the approval of an HRD adviser. Courses counted towards the minor must have a cumulative grade point average of 2.50 or better and no course may carry a grade less than 2.0.

Related minors and concentrations

Normally, students seeking the Bachelor of Science with a major in human resources development may not earn more than one minor or concentration. Students who wish to obtain more than one must obtain the approval of the human resources development program adviser.

The gerontology concentration, co-sponsored by the School of Human and Educational Services and the College of Arts and Sciences, is recommended for HRD students planning careers

of service to older people. A description of the concentration is on page 183.

HRD students may also consider the following concentrations or minors, which supplement the HRD major and may further their educational or career goals. Minors: applied statistics, management, psychology. Concentrations: environmental studies, health behavioral sciences, labor studies (see below), social justice and corrections, social services, urban studies, women's studies.

Concentration in Labor Studies

Coordinator: *William Moorhouse*

Committee: *Dee Lyons (Ken Morris Labor Studies Center), David Meyer (human resources development), Billy Minor (human resources development), Robert Payne (human resources development)*

Labor studies is an interdisciplinary concentration designed to meet the interests of students who wish to identify and focus a portion of their course work on knowledge and skills that will provide an introductory background for leadership roles in union activities.

This concentration is open to any student who has been admitted to Oakland University. Students who wish to seek the concentration must contact an adviser to design a degree plan and to select appropriate courses. (The following course selections are subject to prerequisite requirements, as well as departmental policies.)

Students must submit applications for the labor studies concentration. Applications are available from the human resources development or general studies advising offices. Admission to the concentration requires completion of at least two courses in labor studies or labor/management relations and a background of experience or knowledge in the labor field, as approved by the HRD adviser.

Students seeking a concentration in labor studies must earn 24 credits distributed as follows:

1. Core courses: 8 credits chosen from HI 363, HRD 467 and HRD 469. Note: Workshop and seminar topics must be approved by a human resources development adviser. Typical topics include leadership skills for union leaders, conflict resolution and intervention techniques.
2. One course in organizational theory and practice, chosen from HRD 401, ORG 330, ORG 334, SOC 353 and SOC 381.
3. One course in work life improvement process skills practices, chosen from HI 463, HI 464, IHS 100, IHS 110, ORG 434, SCN 304, SOC 350 and SOC 354.
4. One course in community and society chosen from HST 302, HRD 331, HRD 335, HRD 364, PS 110, PSY 235, PSY 326, SOC 331 and SOC 357.
5. One course in personal development chosen from the following (or an additional course selected from one of the areas above): ENG 382, HI 261, HRD 301, HRD 302, HRD 369, HRD 390, HRD 402, MGT 433, PHL 103, PSY 325 and PSY 331.

Course Offerings

EDUCATION

ED 100 Tutoring Experience in Secondary Education (2)
Students work with teachers and secondary students in schools. Students commit 60 to 80 hours as tutors, teacher aides and leaders of group discussions. To be taken in the freshman year, or for transfer students, during the first semester, upon entering the secondary social studies program.
Corequisite: ED 200.

ED 110 Public Education for the Future (4)
To help beginning elementary education students make career decisions. Students work at least four hours per week in educational institutions. An additional two hours per week of class time is spent examining school practices and evaluating students' professional capabilities.
Prerequisite: Oakland University writing proficiency. Corequisite: ED 210, ED 215.

ED 163 Physical Activity for the Young Child (2)
This course deals with basic knowledge and concepts involved in the acquisition and teaching of motor skills, physical activities and principles of fitness for young children. Emphasis is placed on the practical application of knowledge in the physical activity setting and basic knowledge concerning development and maintenance of physical fitness for an improved lifestyle.

ED 200 Micro-Teaching in Secondary Education (2)
Students identify areas of inquiry related to secondary schools and design personal learning plans which include personal goals for working effectively in a public school. Current educational literature is used to inquire into creativity, self-perception, critical thinking, educational philosophy, motivation and learning theory.
Corequisite: ED 100.

ED 210 Social and Philosophical Issues in Elementary Education (4)
Introduction to the use of philosophical and social science skills in analyzing and resolving education problems.
Corequisites: ED 110, ED 215.

ED 215 Educational Psychology for Elementary Teachers (4)
Incorporates and places into perspective learning theories, developmental theories, biological theories and evaluation, with emphasis on the effects of varied qualities of experience during childhood.
Corequisites: ED 110, ED 210.

ED 220 Early Childhood Development — Experiences with the Young Child (4)
Child development. Instruction, observation and experience with focus on children and their developmental needs during infancy and early childhood, especially in the context of particular settings. Students must register concurrently for ED 221.

ED 221 Early Childhood Development Experience Block (1, 2, 3 or 4)
Experience in a setting with young children. One credit must be taken concurrently with ED 220 and 224. Students who take additional credits of ED 221 must be taking another early childhood course concurrently.

ED 223 Physical and Social Environment in Early Childhood Programs (4)
Various aspects of the social and physical environment for young children. Includes analysis of what makes a healthful, pleasant physical environment and how the roles and relationships of various staff members contribute to this environment.
Prerequisite: Admission to early childhood program taken with no more than one other early childhood course.

ED 224 Early Childhood Programming Activities for the Young Child (4)
Uses of various media and materials, supportive play activities, and specific art, music, science, language and other educational activities for young children. Provides a basic repertoire of skills for the early childhood staff member.
Prerequisite: ED 220 or equivalent. Corequisite: ED 221 and admission to the program.

ED 225 Health and Nutrition — Childhood (4)
Includes knowledge of basic health and safety requirements and basic nutritional and dietary needs for early childhood.
Prerequisite: Admission to early childhood program taken with no more than one other early childhood course.

ED 302 Teaching Mathematics in the Elementary School (4)
This course assists prospective teachers in developing sound pedagogical strategies and instructional techniques for teaching mathematics in the elementary school. Emphasis is placed on the use of a diagnostic-prescriptive model of teaching.
Prerequisite: ED 110, 210, 215, 331, 333, 354, 355 and admission to major.

ED 320 Topics in Early Childhood Curriculum (2 or 4)
Selected curriculum topics relevant to early childhood teachers, with focus on specific curriculum areas identified by advanced early childhood students or special groups working in this field.
Prerequisite: Completion of at least two 200-level early childhood courses.

ED 322 Introduction to Early Childhood: Theory and Practice (4)
Introduction to the field of early childhood: growth and development of infants and young children, optimal learning environments for the young child, and methods and materials. For students who wish some backbground in early childhood but who are not HRD/ED majors. Students must register concurrently for ED 221.
Prerequisite: ED 210 and 215 or permission of instructor.

ED 324 Parent and Community Involvement in Early Childhood Programs (4)
In-depth study of home/school coordination and education. Development of skills and sensitivities in the areas of parent education, parent-teacher conferences, utilization of parents in the classroom and working with parents in the home.
Prerequisite: At least two 200-level childhood courses, or permission of instructor.

ED 325 Learning Environment in Early Childhood (4)
In-depth study of the learning environment and curriculum in early childhood education, including theoretical and practical aspects. Analysis of curriculum areas as they relate to individual children's needs and to the total learning environment.
Prerequisite: At least two 200-level early childhood courses, to be taken with no more than one other early childhood course.

ED 331 Teaching of Reading (4)
Intensive preparation for the teaching of reading skills in the elementary grades. Identification of reading readiness, problems of program construction and a variety of teaching methods are included. Corequisites: ED 333, ED 354 and ED 355.
Prerequisite: ED 110, 210, 215 and admittance to the major.

ED 332 Literature for Children (4)
The ability to evaluate children's literature critically, to understand its history, to assess children's needs and developmental levels, and to be able to select and use quality literature effectively with children are major objectives of the course.
Prerequisite: RHT 101 or equivalent.

ED 333 Teaching the Language Arts (4)
Preparation for teaching language arts in the elementary, middle and early secondary schools. Topics include teaching composition, creative writing, oral language development, listening, spelling, reading and the application of linguistic principles. Corequisites: ED 331, 354, and 355.
Prerequisites: ED 110, 210, 215 and admission to the major.

ED 338 Teaching Reading in the Content Areas (4)
A basic course in reading for prospective secondary teachers. Content will deal with the nature of the reading process and methods and materials for teaching the reading of English, social studies and other subjects to junior and senior high school students. Not open to elementary education majors.

ED 344 Social and Philosophical Issues in Secondary Education (4)
Study of secondary education in broad perspective, as both an interpersonal activity and a social institution. Topics include immediate and ultimate aims of secondary education, the social meaning of the schooling process, and the assumptions underlying school policy.

ED 345 Psychological and Field Studies in Education (4)
Psychological factors in learning and development are examined in lectures, class discussions and observations. These may be observations of actual teaching in the schools, or of videotapes of teaching.

ED 354 Testing and Assessment for Teachers (4)
Prepares a teacher-in-training to make effective use of formal, informal and teacher-created assessment techniques in the process of planning, implementing and evaluating instruction.
Prerequisite: Admittance to program, ED 110, 210, 215. Corequisites: ED 331, 333, 355.

ED 355 Identifying and Diagnosing Learning and Behavior Problems in Children (4)
Students will demonstrate knowledge of individual differences among normal school population; develop competency in delivery of educational services to handicapped persons; demonstrate understanding of various theoretical models of behavior; and demonstrate knowledge of the various statutes that govern education in Michigan. Corequisites: ED 331, 333, 354.
Prerequisite: ED 110, 210, 215 and admittance to program.

ED 370 Field Problems in Social Science (4)
To assist prospective social studies teachers in identifying and solving instructional problems. Students are placed in school to work with teachers and secondary students, operating through a written contract agreed upon by themselves, an appropriate secondary school official and a representative of the social studies program. Transportation must be arranged by the student.
Prerequisite: ED 100 and 200.

ED 396 Educational Uses of Microcomputers (4)
General microcomputer literacy course designed with focus on educational applications to enable education students to utilize microcomputers for career and personal goals. Required for elementary education majors.
Prerequisite: ED 110, 210, 215 and admission to the major.

ED 414 Reading Appraisal in the Elementary Classroom (4)
Involves direct classroom appraisal of reading abilities of children in elementary school classrooms. Formal and informal diagnostic instruments are used. Diagnostic data are used for prescriptive teaching. Specifically involves reading instruction with pupils and involvement with school personnel.
Prerequisite: ED 331. Corequisite: ED 455.

ED 420 Interaction Laboratory for Teacher Development (4)
Acquaints students with the importance of human relations skills in teaching and provides a clearer understanding of the flexible line separating personal and professional behavior. Laboratory activities involve the student in role-playing and action-oriented problem solving. A field experience is included. Corequisites: SS 470, SCS 305 and ED 302.
Prerequisite: ED 110, 210, 215, 331, 333, 354 and 355 and admission to the major.

ED 427 Methods for Teaching Secondary Students (2)
Focus is on the uniqueness of the secondary classroom and the secondary student. Special emphasis will be placed on the development of teaching strategies and human interaction techniques appropriate for teaching secondary students. Such topics as discipline, motivation, instructional technology, skill assessment, evaluation and affective learning will form the learning "core" around which students will be expected to develop the interaction and process skills needed to teach secondary students.
Corequisite: ED 428.

ED 428 Teaching of the Major Field (2)
Content and methodology appropriate to the student's field. Organization of programs and courses, bibliography of the field and techniques of instruction receive special emphasis. Must be taken concurrently with ED 455, except when other provisions have been made by the major department.
Prerequisite: ED 100, 200, 338, 344 and 345. (For social studies majors, the following are also required: ED 354, 370 and SS 100.)

ED 450 Advanced Studies in Early Childhood (2 or 4)
Current issues affecting the field of early childhood, especially those related to current legislation, child advocacy, and the child welfare concern; research methodology appropriate for young children; and/or in-depth issues such as development of infants or exceptional children.
Prerequisite: Completion of all 200-level early childhood courses and at least two 300-level early childhood courses.

ED 455 Internship (12)
Approximately 15 weeks of supervised teaching in a public school classroom and other activities as directed by a supervising teacher. Seminars are held throughout the semester focusing on general and specific teaching concerns of the interns. The semester may be divided into two segements for a dual assignment, depending on program requirements or student needs. A student must complete the internship in his/her last semester (a last semester is one in which a student needs no more than 16 credits to satisfy all graduation requirements). A student must apply for internships one full semester in advance.
Prerequisite: Elementary education majors must complete the core program, general education and childhood curriculum studies requirements; second education majors must complete ED 100, 200, 338, 344, 345 and secure permission of the major department and the School of Human Educational Services. Prospective student teachers must register at the Office of Field Services at the beginning (before September 15 for winter or January 15 for fall) of the full semester before student teaching.

ED 456 Internship in Early Childhood (12)
Work in practicum settings with young children, parents, or caregivers. Students will gradually assume total responsibility for an intensive field experience. Consists of 301 hours of on-site practicum. Includes bi-weekly seminar. No other courses may be taken concurrently and it is strongly advised that the student not be employed or take other courses. Apply September for winter, January for fall.
Prerequisite: 30 credits in early childhood courses with an overall 2.50 grade point average.

ED 490 Independent Study and Research (2 or 4)
A program of directed individual reading and research.
Prerequisite: Permission of the Department of Teacher Education (granted only if a student presents written faculty consent to supervise his/her study).

HUMAN INTERACTION

HI 261 Fundamentals of Human Interaction (4)
Introduction to 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.

HI 360 Interviewing Skills Lab (2)
An application of the methods studied in HI 361. Students practice helping interview skills in a supervised laboratory setting, are video-taped, critiqued and evaluated.
Corequisite: HI 361.

HI 361 The Helping Interview (2)
Listening and responding skills, establishing mutual trust and acceptance, gathering information and providing support in a one-to-one helping relationship. Introduction to related theory and research. Instructional techniques includde role-playing and simulation.
Prerequisite: HI 261 or equivalent. Corequisite: HI 360.

HI 363 Dynamics of Group Relationships (4)
Deals with relationships among group members, including peer and supervisory interaction, in settings such as community agencies, industry and adult training. Covers such basic concepts and practices as teamwork, conflict resolution, consensus, group leadership and support groups.
Prerequisite: HI 261 or equivalent.

HI 461 Introduction to Counseling (4)
Theory and practice of guidance and counseling in brief. Covers professional, ethical and legal issues in helping others. Compares major counseling approaches in both theory and application.
Prerequisite: HI 361.

HI 463 Group Facilitation (4)
Theory and practice of small group process in the helping relationship. Explores several approaches to group leadership and offers an opportunity to experience and/or lead small groups in order to prepare students to foster group interaction. Identical with ED 463.
Prerequisite: HI 363.

HI 464 Consultation (4)
Includes study of processes of internal and external consultation, strategies for intervention in organization and consulting approaches in support of individual helping professionals, supervisors and administrators.
Prerequisite: 2 HI courses.

HUMAN RESOURCES DEVELOPMENT

HRD 301 Human Nature (4)
An analysis of human nature through evolutionary, psychosocial and cultural perspectives. Topics include: the formation of brain, self, ego; the significance of autonomy, love, death; the search for meaning and change. Implications for the helping professions. Identical with PHL 301.

HRD 302 Ethics and Personal Crises (4)
Historical examination of perennial moral crises in sexual behavior, abortion, suicide, euthanasia, criminal punishment and war from the points of view of major historical figures in ethics. Use of ethical knowledge in helping others make moral decisions in personal life is addressed. *Satisfies university general education requirement in Western civilization. Identical with PHL 302.*

HRD 310 Training Design (4)
Adult learning theory including cognitive, affective, psychomotor domains. Instructional design models, needs analysis, occupational task analysis, development of competencies and learning objectives. Determination of appropriate training approach. Selection and evaluation of instructional materials and media. Same as VTE 310.

HRD 331 Community Mental Health (4)
A critical examination of mental health treatment programs, community mental health centers and family-care programs. Socio-cultural factors in the onset of mental illness and roles as members of a treatment team and community resources in mental health.

HRD 335 Substance Abuse (4)
Comprehensive study of the modes of prevention and treatment programs for substance abuse. Readings and reports include basic information about various drugs and alcohol, with history, categories and definitions, misuse, abuse, legitimate use, laws, attitudes and reasons people abuse drugs.

HRD 362 Assessment of Youth and Adults (4)
Techniques in appraising people for educational, occupational and personal-social decisions. Students are introduced to measurement terminology, techniques of test administration and interpretation. Emphasis on synthesis of data in case studies and conferences.

HRD 364 Career Development (4)
Sources of occupational, educational and personal-social information. Techniques for using guidance information in the helping process. Theories of career choice and adjustment, the work ethic and life/work planning.

HRD 336 The Human Services (4)
Overview of human service work. Interdisciplinary relationships among professionals and organizations in helping practice. Surveys major service modalities and legislation impacting human services.

HRD 368 Work and Training Development (4)
Development of jobs and training programs for persons such as displaced workers, handicapped, chronically unemployed unemployed through industry and government action. Appraisal of employers' needs, on-the-job training programs, collaboration among employers and educators and analysis of market factors.

HRD 369 Field Work in HRD (2, 4, 6 or 8)
Exploration of the HRD field through supervised experiences in settings such as training and personnel departments in business, industry and government, employment offices and social service agencies. Students submit application to instructor, then obtain information to seek an approved site.
Prerequisite: Completed application and permission of instructor.

HRD 390 Special Project in HRD (2, 4, 6 or 8)
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 8 credit total.
Prerequisite: Permission of a faculty sponsor by application.

HRD 401 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: Junior standing and two courses in ED, HI or HRD.

HRD 402 Program Planning and Evaluation (4)
Emphasizes skills in developing performance objectives and in organizing, writing and presenting proposals for program development. Methods of evaluation of training and development and human service programs; i.e., action and survey research design.
Prerequisite: Junior standing and HRD 362.

HRD 420 Instructional Methods (2)
Methods of instructing adults in training programs using instructional materials and media. Application of adult learning theory and evaluation of learning based upon competencies. Teacher-student interaction process and use of audio-visual equipment. Same as VTE 420.
Prerequisite: HRD 310. Corequisite:

HRD 421 Instruction Presentation Lab (2)
An application of the methods studied in HRD 420. Students present training program lessons and exercises in a supervised laboratory setting, are video-taped, critiqued and evaluated.
Corequisite: HRD 420.

HRD 422 Instructional Media Lab (2, 4, 6 or 8)
The application of instructional media production techniques. Students develop instructional media for a training program which was designed under HRD 310 or obtained from a training manager. Must be taken more than once for a total of 8 credits.
Prerequisite: HRD 310. Corerequisite: HRD 420 or permission of instructor.

HRD 431 Death and Dying (4)
Seminar on the philosophical, religious, cultural and psychological issues in death and dying. Topics include: religious views of death and after-life; ethical issues in suicide and euthanasia; cultural attitudes toward death and funerals; psychological studies of counseling the dying and the bereaved; children and death; forming attitudes toward one's own death. Recommended for upper-level students only.
Prerequisite: Two HI/HRD courses or permission of instructor.

HRD 440 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: HRD 310, or ORG 330 or 334.

HRD 467 Workshop (2 or 4)
Opportunity for industry/agency personnel and students to focus on various programs and practices. Offered as needed to meet needs of agency or industry employers and training directors. May be taken more than once for 8 credits total.
Prerequisite: Course work or experience in the workshop topic.

HRD 469 Seminar (2 or 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. Visting consultants and the instructor provide direction and content. May be taken more than once for a total of 8 credits.
Prerequisite: Course work or experience in the seminar topic.

HRD 490 Internship in HRD (4, 8 or 12)
A culminating experience where students apply learning in a supervised HRD setting. Students must submit application to instructor two or more months in advance, then obtain information to seek an approved site.
Prerequisite: Senior standing in HRD, completion of 24 or more credits in HI or HRD courses with a grade point average of at least 2.5 and permission of instructor by application.

VOCATIONAL AND TECHNICAL EDUCATION

VTE 300 Vocational/Technical Education (2)
Historical development, philosophy, purpose and intent of vocational and technical education including the structure, function and purposes of educational institutions in our society.
Prerequisite: Major standing or permission of instructor.

VTE 310 Occupational Course Design (4)
How human beings grow and learn. Motivation theory, learning styles, individual and cultural differences. Instructional design models, needs analysis, occupational task analysis, development of competency-based learning objectives. Selection/evaluation of instructional materials and media. Same as HRD 310.
Prerequisite: VTE 300.

VTE 312 School Safety and Health (2)
Analysis of accident causation and prevention in school facilities. Study of federal, state and local codes which apply to safety and health in schools. Review of concepts, methodology and procedures for assessment of safety and health hazards in school science laboratories and vocational education and training facilities. Identical with IHS 312.
Prerequisite: Major standing in Occupational and Technical Education or permission of instructor.

VTE 401 Supervised Occupational Experience (1, 2, 3 or 4)
Directed technical-occupational experience required for vocational education teacher certification. Work must be in a trade area directly related to the area to be certified. May be taken more than once for total of four credits.
Prerequisite: Major standing or permission of instructor.

VTE 420 Methods and Materials of Instruction (2)
Presentation of occupational instruction materials and media. Use of instructional equipment. Application of learning theory and evaluation of earning based upon competencies. Teacher-student interaction, laboratory and simulation methods. Same as HRD 420.
Prerequisite: VTE 310. Corequisite: VTE 421.

VTE 421 Laboratory Instruction (2)
Three dimensional teaching aids, setting up laboratory space for instruction, safety and supervision of students. Physical environment, material handling, tools and equipment, work area planning and all aspects of managing a laboratory course.
Corequisite: VTE 420 (2)

VTE 490 Internship (2,10)
Supervised student teaching experience in a vocational/technical education setting. Students with fewer than nine months of full-time teaching experience must register for 10 credits. Others may apply for permission to register for two credits which cover performance evaluation.
Prerequisite: 12 credits in VTE, senior standing and a minimum overall GPA of 2.5.

SCIENCE STUDIES

SCS 105 Science for the Elementary Teacher (4)
Science concepts and processes based on recent elementary school science education curricula. For education majors only.

SCS 305 Teaching Science to Children (4)
Students develop philosophies of the nature of elementary school science; why teach science and how children learn science. Knowledge and skills in planning instruction, using instructional models, integrating the curriculum, using current science materials and evaluation. Field work is included.
Prerequisite: SCS 105, ED 110, 210, 215, 331, 333, 354, 355. Corequisites: SS 470, ED 420.

SCS 490 Independent Problems in Science Education (2 or 4)
Individual work in science methods and materials. Credits may be applied to a teaching major or teaching minor in science/mathematics. May include a field placement as well as development of specific teaching materials.
Prerequisite: SCS 305 and permission of instructor.

SOCIAL STUDIES

SS 100 Introduction to Social Studies (4)
This introduction to an interdisciplinary social science program provides an overview of the philosophical and historical development of individual social science disciplines (psychology, sociology, anthropology, political science, history, economics and geography). Required of all social studies majors and minors.

SS 470 Teaching Social Studies in Elementary School (4)
An opportunity to examine sources of instructional objectives and strategies, curriculum materials and evaluative procedures for social studies education. Students completing the course should be able to develop, defend and implement an elementary social studies program. A field experience is included.
Prerequisite: ED 110, 210, 215, 331, 333, 354, 355 and admission to the major. Corequisites: SCS 305 and ED 420.

For a description of the social studies program leading to secondary teacher certification refer to the appropriate section in the College of Arts and Sciences.

SCHOOL OF NURSING

Dean: *Andrea R. Lindell*

Office of the Dean: *Barbara Biallas, assistant to the dean; Sue Lindberg, program planning adviser*

Professors: *Anna B. Dugan, Andrea R. Lindell*

Associate professors: *Nadia Boulos, Lorraine M. Wilson*

Assistant professors: *Penny S. Cass, Frances C. Jackson, Mary Ann Krammin, Gary Moore, Diane Wilson, Carol Zenas*

Instructors: *Rita Munley Gallagher, SerVonia Jones, Norman Kloosterman, Laurie K. Miller, Katrina D. Roy, Dolores J. Solosky*

Special instructor: *Ramune Mikaila*

Visiting instructors: *Richard L. Boortz-Marx, Debra E. Gorney-Jankowski, Robin L. Krieger, Jean Mohan, Patricia Tackitt*

Visiting special instructor: *Virginia R. Hosbach*

Lecturers: *Mary Ann Babcock, Karen L. Braniff, Ellen Cary, Barbara S. Donahue, Kathleen A. Emrich, Donna L. Gaffney, Lisa J. Iacobelli, Stephanie A. Lusis, Mary E. Mittelstaedt, Joann Richards, Carolyn L. Rivers, Catherine Vincent*

Applied nursing instructor: *Patricia T. Ketcham*

Adjunct professor: *Cyril A. Akpom*

Adjunct assistant professors: *Joanne Napiewocki, Lynne T. Rinke, Sharon Wilkerson*

Adjunct instructors: *Sandra L. Darby, Rosemary Knapp, Lynne A. Lepisto-Golling, Dahlia Pesselnick, Maria Strom, Stephen R. Tackitt, Melanie G. Ziarkiewicz*

Board of Visitors

The Board of Visitors for the School of Nursing is composed of community leaders in the greater Detroit area. They assist the school in developing goals and objectives, curricula design, and clinical and research programs to meet the rapidly changing and expanding requirements of the health care field. Board members are available individually or collectively for consultation on such matters as facilities, equipment requirements, special topics and long-range planning.

Members of the Board of Visitors are:

Ernest W. Baker, Chairman and President, Baker, Abbs, Cunningham & Klepinger, Inc.
Glenn Betts, Representative, United Auto Workers
Donald J. Bortz, Jr., President, Bortz Health Care Corporation
Joseph F. Galvin, Attorney, Schlussel, Lifton, Simon, Rands, Kaufman, Galvin & Jackier
Representative Dennis M. Hertel, U.S. House of Representatives, 14th District
Ruth Huebner, Rochester, Michigan
Robert Hutton, Grosse Pointe Park, Michigan
Mary Ann Keyes, Associate Hospital Administrator, William Beaumont Hospital
Mercedes Lichtwardt, Bloomfield Hills, Michigan
Richard Prior, M.D., Corporate Medical Director, General Motors Corporation
Robert Shapiro, Vice President for Health Care Services, Perry Drug Stores
Charles Wolfe, Executive Vice President, Jewish Home for the Aged
Sharon Woodcock, R.N., Ann Arbor, Michigan

The Nursing Program

The course of study combines general education in the humanities and the behavioral, biological and physical sciences with special education in the theory and practice of nursing. Graduates qualify for employment as professional nurses in a variety of settings.

The major purposes of the program are:

1. To prepare a generalist nurse for entry into professional practice.
2. To provide a program of quality baccalaureate nursing education grounded on a firm foundation in the liberal arts and sciences.
3. To foster professional role development and commitment to continued personal and professional growth.
4. To prepare a graduate to take the licensure examination of the State Board of Nursing.
5. To prepare a graduate for application to graduate school

National League for Nursing accreditation

The Oakland University School of Nursing is accredited by the National League for Nursing and has approval from the Michigan State Board of Nursing.

The prenursing year

Students wishing to enter the prenursing year, which for most students is equivalent to the freshman year, should have completed two years of high school mathematics, including algebra (a third year is highly recommended); one year of college preparatory biology; and one year of chemistry, in which a grade of B or better is required. A cumulative average of B or better is required.

Prior to orientation, all students take the math and chemistry placement tests and the writing proficiency test.

During the prenursing year, students must complete a minimum of 28 credits (or the equivalent) of introductory courses in the physical and behavioral sciences and the humanities.

Admission to the School of Nursing

Application for admission to the nursing program occurs during the spring session of the prenursing year (generally, the freshman year). Students wishing to be considered for admission are required to meet with the program planning adviser to develop application materials. The School of Nursing has an enrollment quota, which is filled with preference to applicants judged to be best qualified to undertake the program. Preference will be given to students who have completed a majority of their prenursing credits at Oakland University. The School of Nursing encourages and actively seeks applicants among male and minority students.

Admission to the nursing program is selective. It may occur either by progression of freshmen students currently enrolled at Oakland, or by transfer from other institutions. Consideration of students for the nursing program, which begins in the sophomore year, will be based on the applicant's:

1. Admissibility to and retention in the university.
2. Completion of all prenursing courses with a minimum cumulative grade point average of 3.00. Calculation of the grade point average is based on all prenursing courses except mathematics and biology, whether taken at Oakland University or at other institutions. A minimum grade of 2.0 is required in all prenursing courses. Because of the large number of applications received each year, admission to the nursing program is competitive. A 3.00 grade point average in prenursing courses does not guarantee admission.
3. Submission of a completed health history and physical examination, including inoculation for tetanus, skin testing for tuberculosis (and possible chest x-ray) and rubella, and correction of any correctable physical limitations (at student's expense).

4. Obtaining malpractice insurance of at least $1,000,000 coverage for the sophomore, junior and senior years (at student's expense).
5. Completion of an approved Heartsaver or BCLS/BLS (CPR) class within the last year.
6. Submission of all required information to the School of Nursing by specified deadlines.

Transfer policy

The program offered by the School of Nursing is designed to meet National League for Nursing accreditation criteria as well as to reflect the Oakland University philosophy of education. Thus, it is emphasized that the program is more than a mere assemblage of courses.

To ensure the integrity of this program, the School of Nursing has adopted the following transfer policy. Records of students transferring to Oakland University from other academic institutions are evaluated and transfer credit granted as appropriate. Once matriculated at Oakland, students are expected to complete all remaining course work for the degree at Oakland. Exceptions that permit taking courses at another institution must have the prior consent of the School of Nursing Committee on Instruction.

A student who has completed 62 semester hours of credit from any accredited institution(s), including Oakland University, may not transfer additional credits from a community or junior college.

Requirements for the Bachelor of Science in Nursing degree

To earn the Bachelor of Science in Nursing degree, students must complete a minimum of 128 credits, meeting the following requirements:

1. Complete the writing proficiency requirement.
2. Be admitted to candidacy for the Bachelor of Science in Nursing degree by Oakland University and the School of Nursing.
3. Complete all credits and courses prescribed in the degree curriculum, including: 32 credits in general education (see pages 25-28); 59 credits in the nursing component; and 29 credits in the humanities and the behavioral, biological and physical sciences as corequisites to the nursing component, as prescribed by the School of Nursing.
4. Maintain a cumulative grade point average of 2.50 in all nursing courses.
5. Complete at least 32 credits at the 300-level or above.
6. Be in substantial agreement with all legal curricular requirements.
7. Be in compliance with all legal regulations of the School of Nursing.

Plan of Study

Prior to registration for their first nursing (NRS) course, students must complete a Plan of Study in the student program planning office in the School of Nursing. The Plan of Study is a timetable of courses to be taken and assures orderly progress toward satisfying degree requirements.

The following is a model schedule, based on full-time study:

Prenursing year. Fall semester: CHM 104, RHT 100, PHL 103, AN 102 or SOC 100. Winter semester: PSY 100 or PSY 130, RHT 101, PHY 141. Total credits: 28. NOTE: Students must also complete MTH 111*, MTH 112* and BIO 200, either by passing placement examinations or through course enrollment. Credits in these courses do not apply to the Bachelor of Science in Nursing degree. **All prenursing courses must be satisfied prior to application to the nursing program.**

Sophomore year. Fall semester: NRS 223, NRS 225, BIO 205, BIO 206, CHM 201. Winter semester: NRS 230, NRS 234, NRS 205, BIO 207, BIO 307. Total credits: 34. NOTE: BIO 200 is a prerequisite to BIO 205, BIO 207 and BIO 307.

Junior year. Fall semester: NRS 322, NRS 323, NRS 324, NRS 325, general education requirement in arts. Winter semester: NRS 333, NRS 334, PSY 270, general education requirement in arts. Total credits: 32.

Senior year. Fall semester: NRS 420, NRS 422, STA 225, general education requirement in language. Winter semester: NRS 430, NRS 434, NRS 436, general education requirement in international studies. Total credits: 34.
*See the special information concerning these courses on page 97.

Course sequencing

The nursing curriculum has been developed based upon full-time study. Nursing courses must be taken in the order indicated on the Plan of Study. Students who have already completed non-nursing courses may have a lighter course load than normal, but they will not complete the program earlier.

Students are not allowed to register for the next year of the nursing major without having successfully completed all designated course requirements for the previous year. Students who are not eligible to progress to the next level are placed on inactive status. Their return to the program is contingent upon availability of space. Students who return to the nursing program from inactive status must comply with all School of Nursing policies currently in effect.

Registered Nurse sequence

The School of Nursing offers registered nurses an opportunity to earn a Bachelor of Science in Nursing. The purposes, philosophy and objectives of the B.S.N. program are primarily the same for traditional and registered nurse students. One difference is noted in NRS 223 at the sophomore level. NRS 223 was designed as a transition course to provide content not obtained in the previous educational experience. An RN's clinical experience and maturity also are taken into account in demonstration of clinical competency.

Students who have satisfactorily completed a diploma or associate degree program in nursing and who possess a valid Michigan R.N. license may apply for admission to the B.S.N. program. Registered nurses must complete all credits and/or courses in the degree program.

Completion may be achieved in several ways, including:

1. CLEP (College Level Examination Program) and ACT Proficiency Examination Program (PEP) credit. Academic credit may be granted for courses for what students know, regardless of where or how they acquired the knowledge.
2. Transfer of credits. The School of Nursing evaluates previous course work to determine equivalency.
3. Credit by examination at Oakland University. Registered nurses may demonstrate competency by passing competency examinations, except as noted below.
4. Required course enrollment. When course requirements cannot be fulfilled by the above methods, R.N. students must enroll and successfully complete courses. All R.N. students are required to enroll in NRS 223, NRS 420, NRS 422, NRS 430 and NRS 436.

This program is designed to allow students to proceed at their own pace.

Clinical Placements

Nursing students are placed in hospitals and other clinical settings each semester. These clinical experiences provide students with opportunities to apply theory to practice in working with individuals, families or groups.

Cooperating agencies are located throughout the metropolitan Detroit area. Students are responsible for providing their own transportation to and from the clinical agency. It is imperative that students have access to their own transportation for community health clinical placements in the senior year.

Grade point policy

Each student's program progress will be reviewed at the end of each nursing course. The periods between reviews are grading periods. The term grade means:

1. an overall grade for a course, or

2. either a clinical grade or a theory grade, when a course contains both components (the component grade).

Probation/termination

1. A student assigned a course or component grade below 2.5 is automatically placed on probation. A student assigned a course or component grade below 2.0 is subject to academic dismissal from the program. In the latter case, the school may impose a remediation program while probation continues or may immediately terminate the student from the nursing program. A student on probation who in the next grading period has no nursing grade or grades below 2.5 will be removed from probation if this is consistent with any remediation program imposed. A student on probation, who in the next grading period has a grade or grades below 2.5, may be immediately terminated from the nursing program or may have a remediation program imposed while probation continues, as the school shall determine.
2. A student must maintain a G.P.A. of at least 2.50 in all nursing courses to remain in good academic standing. If a student's nursing G.P.A. falls below 2.50, the student is automatically placed on probation. If a student increases the nursing G.P.A. to at least 2.50 within the next two grading periods, the student will be removed from probation. If not, the school may impose a remediation program while probation continues or immediately terminate the student from the nursing program.
3. A student who earns course or component grades below 2.5 in two nursing courses within the same grading period may be immediately terminated from the nursing program or may have a remediation program imposed while on probation, as the school shall determine.
4. A student who is placed on probation by the School of Nursing more than one time may be immediately terminated from the nursing program or may have a remediation program imposed while on probation, as the school shall determine.

Graduation

In addition to satisfying other stated requirements, to be recommended for graduation:

1. A student must be in good academic standing (non-probationary).
2. A student must have a cumulative G.P.A. of at least 2.50 in nursing courses.
3. A student must have a grade of at least 2.0 in all required non-nursing courses.
4. A student placed on probation at the expected time of graduation may have a remediation program imposed as the school shall determine.

Sigma Theta Tau

Theta Psi, the local chapter of Sigma Theta Tau International Honor Society in Nursing, was chartered in April 1986 at Oakland University. Candidates for membership are selected on the basis of superior scholastic achievement, evidence of professional leadership potential and dependable personal qualifications.

National Student Nurses Association

Prenursing and nursing students are eligible and encouraged to join and remain members of the National Student Nurses' Association. NSNA is the mechanism through which students participate in planning and formulating policies related to the School of Nursing.

Qualification for licensure

Licensure is obtained through satisfactory performance on the licensing examination prescribed by the State of Michigan. Upon registration of the license, a nurse is known as a registered nurse (R.N.). Licensure in one state entitles a qualified holder to seek licensure by endorsement in other states.

Applicants who have been convicted of charges other than minor traffic violations may be denied a license to practice nursing.

Course Offerings

Nursing course may include student learning experiences in the following settings: classroom, learning resource laboratory and clinical agencies in the community.

NRS 205 Health Assessment (1)
Introduces students to the process of health assessment. Emphasis on physical examination of all body systems and techniques for communicating data collected to other health personnel.
Prerequisite: BIO 205 and 206.

NRS 223 Introduction to Professional Nursing I (5)
Introduces physiologic stress adaptation concepts as they apply to commonly occurring situations in health and illness. Content explores nursing as a profession, nurse-client interaction, the health-illness continuum, the health care delivery system. Nursing practice and nursing diagnosis will be utilized as methodologies of professional practice. Opportunity for the demonstration of clinical competency.

NRS 234 Introduction to Professional Nursing II (6)
Focuses on topics relating to basic human needs and nursing interventions that promote or maintain health throughout the life cycle.
Prerequisite: BIO 205 and 206.

NRS 225 Interpersonal Relationships in Nursing (3)
Focus on therapeutic communication between the nurse and clients at all points along the health continuum utilizing a variety of frameworks. Topics will include nursing care of clients demonstrating more commonly occurring types of disruptive behavior.

NRS 230 Pharmacotherapeutics (2)
Focuses on basic concepts of pharmacology and their application in the clinical setting. Jointly offered with HS 331.

NRS 322 Pathophysiology (3)
Examines how physiological functions are modified by disease processes.

NRS 323 Nursing Care of Children (4)
Implications of increasingly complex variables related to health and illness in children. Emphasis is on the interaction of biological responses to stressors from birth through adolescence. Study provides the base for expanding competence in nursing skills centering on care function and more sophisticated application of nursing process with clients in various clinical settings.

NRS 324 Nursing Care of Adults I (4)
Explores the effect of variables related to health and illness in the adult. Emphasis is on the interaction of biological responses to stressors in the adult life cycle. Study provides the base for expanding competence in nursing skills centering on care functions and more sophisticated application of nursing process with clients in acute care clinical settings.

NRS 325 Learning Resource Lab: Adults/Children (1)
Practice and validation of specific nursing care skills in the learning resource laboratory.

NRS 333 Nursing Care of Clients with Emotional Disorders (4)
Study focuses on the care of children and adults in acute psychiatric settings. Includes exploration of variables affecting the development of psychopathology and emphasizes the development of nursing skills to provide care for patients experiencing acute psychiatric problems.

NRS 334 Nursing Care of the Emerging Family (4)
Experience in the care of families throughout the maternity cycle. Emphasis is on the care of mothers and infants in the labor room, delivery and post partum settings. Focus is on variables contributing to a healthy pregnancy, normal delivery and positive transition to parenthood.

NRS 360 Advanced Care of the Adult-Extern (4-6)
Provides precepted theoretical and clinical practice and classroom instruction in an acute care setting, working with an adult population.
Prerequisite: Completion of all junior-level courses.

NRS 420 Professional Nursing in the Community (9)
Exploration of the functions of the community health nurse with the individual, the family and the community. Emphasis is on analysis of client adaptation to environmental stressors, nursing actions directed toward prevention of illness, restoration, maintenance and promotion of public health, and collaboration with others in the community to achieve mutual goals.

NRS 422 Nursing Research (2)
A broad overview of the research process in nursing. Includes content related to nursing theory, research design, data analysis strategies and computers in health care. Major emphasis is on the use of research concepts for the purpose of evaluating relevant research for use in nursing practice.

NRS 430 Leadership in Professional Nursing (3)
Seminar designed to enable students to develop a beginning framework for nursing leadership and practice. In-depth examination of management principles, theories and professional practice issues.
Corequisite: NRS 436.

NRS 434 Nursing Care of Adults II (3)
Nursing of adult clients experiencing increasingly complex biopsychosocial altercations.
Corequisite: NRS 436.

NRS 436 Practicum in Professional Nursing (5)
Practicum, offered in a variety of acute care settings designed to facilitate the transition from student to practicing professional. Students will apply the nursing process to acutely ill clients while functioning as a leader and an agent of change.

NRS 460 Topics in Nursing (2-4)
Provides comprehensive theoretical nursing content to senior nursing students in a specialty area, e.g., critical care, maternity, industrial, intensive care, operating room, etc. Clinical experience in a health care facility may be required.
Prerequisite: NRS 420 or 430.

NRS 490 Independent Study (Credit varies up to 12)
Options include the opportunity for selected students to participate in faculty research or preceptorships in areas of special interest.

*Nursing course content is presently being reviewed and may be modified.

GENERAL STUDIES

Faculty council for general studies: *Lowell Eklund, chairperson; Frank Cioch, assistant professor, School of Engineering and Computer Science; James Clatworthy, associate professor, School of Human and Educational Services; John Cowlishaw, associate professor, Biological Sciences; Indra David, associate dean, Kresge Library; David Diltz, assistant professor, School of Business Administration; Robert Facko, associate professor, Music, Theatre and Dance; Alice Horning, associate professor, Rhetoric, Communications and Journalism; Barbara Kiwicz, visiting instructor, School of Business Administration; Norman Kloosterman, instructor, School of Nursing; David Lau, assistant professor, Rhetoric, Communications and Journalism; Jerry Marsh, special instructor, School of Engineering and Computer Science; David Meyer, associate professor, School of Human and Educational Services; Melodie Monahan, assistant professor, English; Ann Pogany, assistant professor, Kresge Library; Uwe Reischl, associate professor, School of Health Sciences; Whitney Walton, assistant professor, History*

The Bachelor of General Studies

The Bachelor of General Studies degree (B.G.S.) is a university-wide baccalaureate program that offers maximum flexibility and opportunity for student decision-making about courses of study at Oakland University. The degree is primarily intended for students wishing to create a program to meet their individual goals through interdisciplinary study.

Students entering the General Studies program design a program of study utilizing courses from the university to prepare them for a particular job or career choice. Students may select courses from any field of study offered by an academic department, subject to prerequisites and policies set by the individual departments. This program offers students the opportunity to plan a unique and challenging academic program in cooperation with a General Studies faculty adviser.

Frequently, students seeking the degree have earned academic credits from other colleges and have been encouraged by their employers to pursue a baccalaureate degree. The General Studies program has flexible policies on transfer credits from other institutions, and it provides a personalized program to meet the educational needs of individuals and employers. Pre-enrollment counseling is available to those who are considering this degree.

Students applying to the General Studies program are first admitted to pre-B.G.S. status. Students may be granted major standing upon approval of their plan of work and supporting rationale by the General Studies Faculty Advising Committee.

Two-Plus-Two program for associate degree holders

The General Studies program allows students to combine broad liberal arts and professional courses with associate degrees from Michigan community colleges. The Two-Plus-Two program provides for transfer of up to 62 semester credits from accredited two-year institutions in Michigan. Students with associate degrees in any area except nursing may qualify for the Two-Plus-Two General Studies program. Holders of associate degrees in nursing are subject to a course by course evaluation.

The program requires that courses accepted for transfer must have a grade of C or above, that at least 12 semester credits have been earned in liberal arts courses, and that all course work was taken at accredited institutions.

Requirements for the degree in Bachelor of General Studies

To earn the Bachelor of General Studies degree, students must complete at least 124 credits, meeting the following requirements:

1. Complete the writing proficiency requirement.

2. Complete the general education requirements. (See the general education requirements as detailed on pages 25-28.)
3. Complete 32 of those credits at the 300- or 400-level.
4. Complete 32 credits at Oakland University; complete the last 4 credits toward the degree at Oakland.
5. Successfully complete at least the last 24 credits at Oakland University as an admitted candidate for the Bachelor of General Studies degree. Candidacy is authorized by the university and the Faculty Council for General Studies when a student's plan of work and supporting rationale have been approved by the General Studies Faculty Advising Committee.
6. Be in substantial agreement with legal curricular requirements of the State of Michigan.

Concentrations or minors

General Studies students may wish to develop programs that include concentrations or minors offered by other academic schools or departments within the university. About 50 minors and concentrations are available to General Studies students; a complete listing may be obtained from the General Studies office.

Students should consult a General Studies counselor to determine policies and procedures on seeking minors or concentrations.

Advising

Because the General Studies program is individualized by design, faculty advising is central to the program. Each student should follow a specific advising procedure, including:

1. Seek an initial appointment with a General Studies counselor. The counselor will explore with the student the suitability of the program to the student's needs and will, if appropriate, assign a faculty adviser. Students entering the program through a change of major or through the readmission process are required to have a grade point average and academic progress indicator (see pages 35-36) of 2.00 or higher.
2. Be assigned a faculty adviser. When a student elects a pre-B.G.S. program through an admission application or a Change of Major Form, the counselor will give the student a list of faculty advisers and their special areas of interest. The student will either select a faculty adviser or will be assigned one.
3. Attend an initial advising session. The student and the faculty adviser will meet to discuss the student's goals and the courses that may help the student achieve those goals. The student will complete a plan of work and write a rationale for course selection.
4. Develop a plan of work and rationale. The plan and rationale are due in the General Studies office within five weeks after the initial meeting with the General Studies counselor.
5. Attain committee approval. After the faculty adviser approves them, the plan and the rationale will be sent to the Faculty Advising Committee for approval. The committee meets monthly to approve student programs. Upon approval, the student will be granted major standing.
6. Substitutions to the plan of work. Students who want to take courses other than those listed on their approved plans of work must gain consent of their faculty adviser or a General Studies counselor. Plan of Work Substitution forms are available from the General Studies office or faculty advisers. They must be submitted to the General Studies office.

Conciliar honors

Conciliar honors are awarded to General Studies students by the Faculty Council for General Studies.

There are two ways in which students may gain conciliar honors. Students who have cumulative grade point averages of 3.60 or better are automatically nominated for conciliar honors. Students may be nominated for honors if they have cumulative grade point averages between 3.30 and 3.59. Students may nominate themselves or be nominated by a faculty adviser. Writ-

ten nominations, accompanied by faculty recommendations, should be made on the basis of excellence in scholarship, appropriate community and university experience, and/or achievement of academic distinction while overcoming extreme adversity. Nominations will be considered by the advising committee and will be forwarded to the faculty council for final approval.

On-campus Evening Degree Programs

Students may earn undergraduate degrees at night in 20 majors, including General Studies. See page 37 for details.

DIVISION OF CONTINUING EDUCATION

Dean: *Lowell R. Eklund*

Office of the Dean: *Gloria Boddy, director, Accounting Assistant Program; Elaine Chapman-Moore, director, General Studies Program; Sheryl Lynn Clark, program manager, Field Services, Evening/Extension Program; Priscilla A. Hildum, director, Legal Assistant and Profession Programs; Nadine E. Jakobowski, director, Marketing, Continuing Education, and Non-credit Computer Courses; Audrey A. Maariner, program director, Personal Financial Planning Program; Katherine Z. Rowley, director, Plastics, Business and Industrial Programs*

The Division of Continuing Education is responsible for evening and extension programming and for noncredit learning experiences. The multifaceted programs of the division are designed to help people perform more effectively on the job and in their daily lives.

Noncredit course department programming includes cooperating with business and industry, governmental units, health care and other organizations in conducting university-level programs to meet their needs. Noncredit offerings are revised continually to meet the expressed needs of nontraditional adult learners, as individuals and as members of organized groups.

Evening Extension Program: Undergraduate

Coordinator of field services: *Sheryl Lynn Clark*

Oakland University offers undergraduate courses at various sites in southeast Michigan, including: Dondero, Kimball and Shrine high schools, Royal Oak; Groves High School, Birmingham; Carleton Junior High School, Sterling Heights; Jewish Community Center, West Bloomfield; Pontiac Art Center, Pontiac; and schools in Clarkston, Dryden, Lake Orion and Romeo.

Extension courses also are offered to businesses, government agencies, private agencies and civic groups. The courses provide special instruction to the employees or members of these organizations. Most courses can be taught at the organization's facility. Course content is structured to address specific needs or goals identified by the organization.

Non-matriculating admission

Potential evening students who have never attended Oakland University and are unable to secure regular admission to the university because of time constraints may register for classes at extension sites on a non-matriculating basis, if space is available. Non-matriculating students are charged an application fee.

Non-matriculating admission is valid for only one semester. During that semester, students must secure regular admission to the university. To be considered for regular admission, students need to submit a second application for admission to the Office of Admissions and Scholarships, with the required fee, and forward transcripts from all past colleges, universities or high schools attended. Students who are accepted will receive a letter of admission. Non-matriculating students will receive full academic credit for courses in which they are enrolled.

Post-baccalaureate admission

Potential evening students who hold baccalaureate degrees or advanced degrees (such as a master's degree) and who are unable to secure regular admission to the university because of time constraints may register for undergraduate classes at extension sites on a post-baccalaureate basis, if space is available.

Under post-baccalaureate status, students are admitted as special non-degree candidates. Their previous academic work is not evaluated by the registrar's office.

To obtain post-baccalaureate status, students must complete the undergraduate admissions application and pay an application fee at the time of registration at the extension site. A duplicated copy of a baccalaureate diploma or a copy of a transcript stating the degree earned must be presented at registration.

Extension course cancellation

Oakland University reserves the right to cancel any extension course that does not have sufficient enrollment. All tuition and fees applicable to the cancelled section will be automatically refunded when a course is cancelled.

Additional Learning Experiences

The Division of Continuing Education course department offers primarily evening non-credit diploma programs and courses in professional, paraprofessional and vocational subjects. It provides on-site or on-campus updates for business, industry and governmental units.

The division offers courses and workshops that provide technical update in such areas as statistical process (quality) control, hands-on computer and word processing, and video production. It offers courses in areas of current significance, such as personal financial planning and investment. It also offers diploma programs, as well as a certificate program in financial planning.

All programs and courses carry the nationally recognized Continuing Education Unit (CEU). Similar to credits, which provide a means of carrying degree work from one school to another, CEUs make it possible to document non-credit work and provide a means to build a permanent record of achievement valuable for evidence of increased capabilities and for job advancement. One CEU equals 10 contact hours of participation in an organized continuing education experience.

Professional staff development programs for business and industry

The Course Department provides on-site professional staff development programs for business and industry for both credit and non-credit. Offered are programs in applied statistics, co-sponsored with the Department of Mathematics of the College of Arts and Sciences, and programs in engineering and computer science, co-sponsored with the School of Engineering and Computer Science. Clients served by these programs include Ford Motor Company, General Motors Corporation, Chrysler Corporation, Federal Mogul Corporation and Eaton Corporation, as well as many automotive suppliers.

Diploma and certificate programs

Diploma programs, a series of courses related to individual objectives, are offered in plastics technology and as preparation for becoming a legal assistant and an accounting assistant.

The Plastics Technology Diploma Program, co-sponsored with the Society of Plastics Engineers, is designed to update those in technically oriented positions and to provide basic knowledge for individuals who wish to enter the plastics industry.

The Legal Assistant Diploma Program, approved by the American Bar Association, is an 18-month evening program that trains paraprofessionals to perform law-related duties for attorneys in a variety of workplaces. Certain legal assistant courses have been approved for one hour of undergraduate credit in political science. Eight credits of these courses can be applied toward a major in political science. For more information on undergraduate credit, see the political science listings or contact the legal assistant program director in the Division of Continuing Education.

The Accounting Assistant Diploma Program is a 15-month program developed in conjunction with business firms to impart skills to paraprofessionals who provide vital support for accountants.

A Certificate Program in Personal Financial Planning, offered in conjunction with the School of Business Administration, augments the professional training of individuals with a broad range of business experience (including Certified Public Accountants who are seeking relicensure hours). The program is designed for individuals who are now or might become involved in advising clients about financial planning.

Reviews for professional licensure and certification

Qualifying hours for CPA relicensing are periodically offered during special weekend programs. A review program for the Certified Internal Auditor examination also is conducted.

A new Certified Information Systems Auditor (CISA) exam review course has been introduced by the Division of Continuing Education course department, in cooperation with the Detroit Area Chapter of the EDP Auditors Association.

Educational test preparation workshops

Test preparation workshops for the Scholastic Aptitude Test (SAT), American College Testing (ACT), Graduate Record Exam (GRE) and Graduate Management Admissions Test (GMAT) are offered year-round. The SAT and ACT workshops are designed for college-bound high school students or individuals who decide to enter a college program after an interruption of the traditional high-school-to-college progression. The GRE and GMAT workshops are designed for individuals seeking admission to a post-baccalaureate degree program.

Conferences

Conferences on topical subjects are offered on a limited basis. Included among the offerings are: the Writer's Conference, which has been conducted each fall for more than 25 years; the Conference on Intelligent Systems and Machines, co-sponsored by the School of Engineering and Computer Sciences; the Prevention of Coronary Heart Disease Symposium, co-sponsored by the School of Health Sciences, Meadow Brook Health Enhancement Institute and Crittenton Hospital.

UNIVERSITY FACULTY

This list reflects faculty appointments effective June 1, 1986 as they were available on the publication date.

Officers of Instruction

JOSEPH E. CHAMPAGNE, President of Oakland University and Professor of Management; Ph.D., Purdue University

KEITH R. KLECKNER, Senior Vice President for University Affairs and Provost and Professor of Engineering; Ph.D., Cornell University

The Faculty

ALI A. ABBASI, Clinical Associate Professor of Health Sciences; M.D., Damascus University

HODA ABDEL-ATY-ZOHDY, Assistant Professor of Engineering; Ph.D., University of Waterloo

BONNIE F. ABIKO, Assistant Professor of Art History; Ph.D., Princeton University

JOYCE ADELSON, Adjunct Assistant Professor of Music; B.M., Eastman School of Music

CHARLES W. AKERS, Professor of History; Ph.D., Boston University

CYRIL A. AKPOM, Adjunct Professor of Nursing; Ph.D., M.D., University of Aberdeen (Scotland)

ASUMAN G. AKSOY, Assistant Professor of Mathematical Sciences; Ph.D., University of Michigan

JANICE ALBRIGHT, Adjunct Assistant Professor of Music; B.M.Ed., Indiana University

RAYNOLD L. ALLVIN, Associate Professor of Music; D.M.A., Stanford University

ABDUL A. AL SAADI, Clinical Assistant Professor of Medical Laboratory Sciences; Ph.D., University of Michigan

OSMAN D. ALTAN, Adjunct Associate Professor of Engineering; Ph.D., University of California (Berkeley)

WALLIS MAY ANDERSEN, Assistant Professor of Rhetoric; Ph.D., University of Detroit

KEVIN T. ANDREWS, Assistant Professor of Mathematical Sciences; Ph.D., University of Illinois

SHELDON L. APPLETON, Professor of Political Science and Associate Dean for Advising, College of Arts and Sciences; Ph.D., University of Minnesota

JAIME V. ARAGONES, Clinical Assistant Professor of Health Sciences; M.D., University of Santo Tomas (Philippines)

JOSEPH A. ARENDS, Clinical Assistant Professor of Exercise Science; M.D., Wayne State University

HARVEY J. ARNOLD, Professor of Mathematical Sciences; Ph.D., Princeton University

JOSEPH ASSENZO, Adjunct Professor of Mathematical Sciences; Ph.D., Oklahoma University

THOMAS A. ASTON, Adjunct Assistant Professor of Theatre and Assistant to the Director, Center for the Arts; Wayne State University

JOHN W. ATLAS, Associate Professor of Education; Ed.D., Wayne State University

ALLEN L. BABCOCK, Clinical Assistant Professor of Physical Therapy; M.D., Loyal-Stritch School of Medicine (Maywood, Illinois)

WILLIAM R. BACK, Clinical Assistant Professor of Exercise Science; D.O., Kirksville College

DONOVAN M. BAKALYAR, Clinical Associate Professor of Medical Physics; Ph.D., University of Minnesota

MORRIS I. BANK, Clinical Assistant Professor of Medical Physics; Ph.D., University of Michigan

EDWARD A. BANTEL, Professor of Education and Psychology; E.D., Columbia University

LIZABETH A. BARCLAY, Assistant Professor of Management; Ph.D., Wayne State University

JOHN BARNARD, Professor of History; Ph.D., University of Chicago

CARL F. BARNES, JR., Professor of Art History and Archaeology and Director, Center for the Arts; Ph.D., Columbia University

RICHARD F. BARRON, Associate Professor of Education; Ph.D., Syracuse University

JOHN W. BARTHEL, Associate Professor of German and Linguistics; Ph.D., University of Illinois

BILLY BEN BAUMANN, Clinical Assistant Professor of Medical Laboratory Sciences; M.D., Washington University (St. Louis, Missouri)

JOHN L. BEARDMAN, Professor of Art; M.F.A., Southern Illinois University

DAVID C. BEARDSLEE, Professor of Psychology and Director, Office of Institutional Research; Ph.D., University of Michigan

RONALD R. BECK, Adjunct Associate Professor of Engineering; Ph.D., University of Iowa
LOIS BEERBAUM, Clinical Instructor in Medical Laboratory Sciences; M.S., Wayne State University
BEVERLY K. BERGER, Associate Professor of Physics; Ph.D., University of Maryland
EDWARD G. BERNACKI, Clinical Assistant Professor of Medical Laboratory Sciences; M.D., Wayne State University
JAY BERNSTEIN, Clinical Professor of Medical Laboratory Sciences; M.D., Wayne State University
PETER J. BERTOCCI, Professor of Anthropology; Ph.D., Michigan State University
KEITH A. BERVEN, Assistant Professor of Biological Sciences; Ph.D., University of Maryland
WILLIAM E. BEZDEK, Associate Professor of Sociology; Ph.D., University of Chicago
BHUSHAN L. BHATT, Associate Professor of Engineering and Acting Associate Dean, School of Engineering and Computer Science; Ph.D., Oakland University
JANE M. BINGHAM, Professor of Education; Ph.D., Michigan State University
PETER J. BINKERT, Professor of Linguistics and Classics; Ph.D., University of Michigan
VIRGINIA R. BLANKENSHIP, Assistant Professor of Psychology; Ph.D., University of Michigan
GLORIA T. BLATT, Associate Professor of Education; Ph.D., Michigan State University
DUANE L. BLOCK, Consulting Professor of Health Sciences; M.D., University of Wisconsin
MARK S. BLUMENKRANZ, Adjunct Professor of Biomedical Sciences; M.D., Brown University
DAVID E. BODDY, Professor of Engineering; Ph.D., Purdue University
SETH BONDER, Adjunct Professor of Mathematical Sciences; Ph.D., Ohio State University
LESLIE DiANNE BORDERS, Assistant Professor of Education; Ph.D., University of Florida
SHARON T. BOSTICK, Assistant Professor, University Library; A.M.L.S., University of Michigan
ELEFTHERIOS N. BOTSAS, Professor of Economics and Management; Ph.D., Wayne State University
NADIA BOULOS, Associate Professor of Nursing; Ph.D., R.N., University of Michigan
LOUIS R. BRAGG, Professor of Mathematical Sciences; Ph.D., University of Wisconsin
JEAN S. BRAUN, Professor of Psychology; Ph.D., Wayne State University
DANIEL N. BRAUNSTEIN, Professor of Management and Psychology and Chairperson, Department of Management and Marketing; Ph.D., Purdue University
DAVID C. BRICKER, Associate Professor of Philosophy; Ph.D., Johns Hopkins University
GOTTFRIED BRIEGER, Professor of Chemistry; Ph.D., University of Wisconsin
JANE BRIGGS-BUNTING, Associate Professor of Journalism; J.D., University of Detroit
MAX BRILL, Associate Professor of Psychology; Ph.D., University of Cincinnati
MARC E. BRIOD, Associate Professor of Education and Philosophy; Ph.D., Northwestern University
RICHARD W. BROOKS, Associate Professor of Philosophy; Ph.D., University of Minnesota
ARNOLD L. BROWN, Clinical Assistant Professor of Health Sciences; M.D., University of Texas
JUDITH K. BROWN, Professor of Anthropology; Ed.D., Harvard University
ROBERT W. BROWN, Associate Professor of Education; Ph.D., Wayne State University
WILLIAM C. BRYANT, Associate Professor of Spanish; Ph.D., University of California (Berkeley)
DOLORES M. BURDICK, Associate Professor of French; Ph.D., University of California (Berkeley)
HARVEY BURDICK, Professor of Psychology; Ph.D., University of Minnesota
RICHARD J. BURKE, Professor of Philosophy and Chairperson, Department of Philosophy; Ph.D., University of Chicago
FRANCIS M. BUTTERWORTH, Professor of Biological Sciences; Ph.D., Northwestern University
HAROLD C. CAFONE, Professor of Education; Ed.D., University of Arizona
BARUCH CAHLON, Associate Professor of Mathematical Sciences; Ph.D., Tel Aviv University
JOSEPH A. CALCATERRA, Clinical Assistant Professor of Industrial Health and Safety; J.D., Wayne State University
DENIS M. CALLEWAERT, Professor of Chemistry; Ph.D., Wayne State University
JOHN B. CAMERON, Professor of Art History and Chairperson, Department of Art and Art History; Ph.D., Yale University
RAY A. CARLSON, Clinical Instructor in Medical Physics; M.S., Wayne State University
LARRY S. CARR, Assistant Professor of Exercise Science; Ph.D., Brigham Young University
PENNY S. CASS, Assistant Professor of Nursing; M.S., R.N., University of Michigan
THOMAS W. CASSTEVENS, Professor of Political Science; Ph.D., Michigan State University
PAUL W. F. CHAO, Visiting Assistant Professor of Management; Ph.D., Washington State University
BANDANA CHATTERJEE, Assistant Professor of Chemistry; Ph.D., University of Nebraska
CHARLES CHING-AN CHENG, Associate Professor of Mathematical Sciences; Ph.D., Rutgers University

KA CHAI CHEOK, Assistant Professor of Engineering; Ph.D., Oakland University
J. CURTIS CHIPMAN, Associate Professor of Mathematical Sciences; Ph.D., Dartmouth College
MICHAEL CHOPP, Associate Professor of Physics; Ph.D., New York University
MARA J. CHRISTIANSEN, Clinical Instructor in Medical Laboratory Sciences; B.S., Capital University (Columbus, Ohio)
ROBERT J. CHRISTINA, Associate Professor of Education; Ph.D., Syracuse University
JOSEPH P. CHU, Clinical Associate Professor of Industrial Health and Safety; Ph.D., Purdue University
FRANK A. CIOCH, Assistant Professor of Engineering; Ph.D., University of Michigan
F. JAMES CLATWORTHY, Associate Professor of Education; Ph.D., University of Michigan
MARY P. COFFEY, Assistant Professor of Mathematical Sciences; Ph.D., University of Michigan
SADIK COKELEZ, Assistant Professor of Management; D.B.A., Texas Technological University
WILLIAM W. CONNELLAN, Adjunct Assistant Professor of Journalism and Associate Provost; Ph.D., University of Michigan
GEORGE E. COON, Professor of Education; Ed. D., Wayne State University
DAVID N. COOPER, Associate Professor of Education and Director, Ken Morris Labor Studies Center; Ed.D., Rutgers University
ROSE MARIE COOPER, Special Instructor in Rhetoric; Ph.D., Wayne State University
BRIAN P. COPENHAVER, Professor of History and Dean, College of Arts and Sciences; Ph.D., University of Kansas
CARLO COPPOLA, Professor of Hindi-Urdu and Linguistics and Director, Center for International Programs; Ph.D., University of Chicago
JOHN D. COWLISHAW, Associate Professor of Biological Sciences; Ph.D., Pennsylvania State University
RONALD L. CRAMER, Professor of Education; Ph.D., University of Delaware
WILLIAM S. CRAMER, Assistant Professor, University Library; M.S.L.S., Case Western Reserve University
THERESA M. CROSS, Assistant Professor of Management; Ph.D., Wayne State University
DOROTHY CUMMINGS, Clinical Instructor in Medical Laboratory Sciences; B.S., Wayne State University
JOHN P. CUTTS, Professor of English; Ph.D., University of Birmingham
GEORGE DAHLGREN, Professor of Chemistry, Vice Provost and Dean of Graduate Study; Ph.D., University of Wyoming
DAVID W. DANIELS, Professor of Music and Chairperson, Department of Music, Theatre and Dance; Ph.D., University of Iowa
SANDRA L. DARBY, Adjunct Instructor in Nursing; M.S.N., R.N., Wayne State University
MANOHAR K. DAS, Assistant Professor of Engineering; Ph.D., Colorado State University
INDRA M. DAVID, Associate Professor and Associate Dean, University Library; M.S.L.S., Syracuse University
JAMES E. DAWSON, Associate Professor of Music; A.Mus.D., University of Michigan
DOMINIC DeGIUSTI, Adjunct Professor of Biological Sciences; Ph.D., University of Wisconsin
HENRY R. DeLORME, Special Instructor in Exercise Science; M.A.T., Oakland University
JOSEPH W. DeMENT, Professor of English; Ph.D., Indiana University
DANIEL E. DeSOLE, Clinical Professor of Health Behavioral Science; M.D., University of Cincinnati
EDWARD B. DeVOL, Instructor in Mathematical Sciences; M.A., University of Michigan
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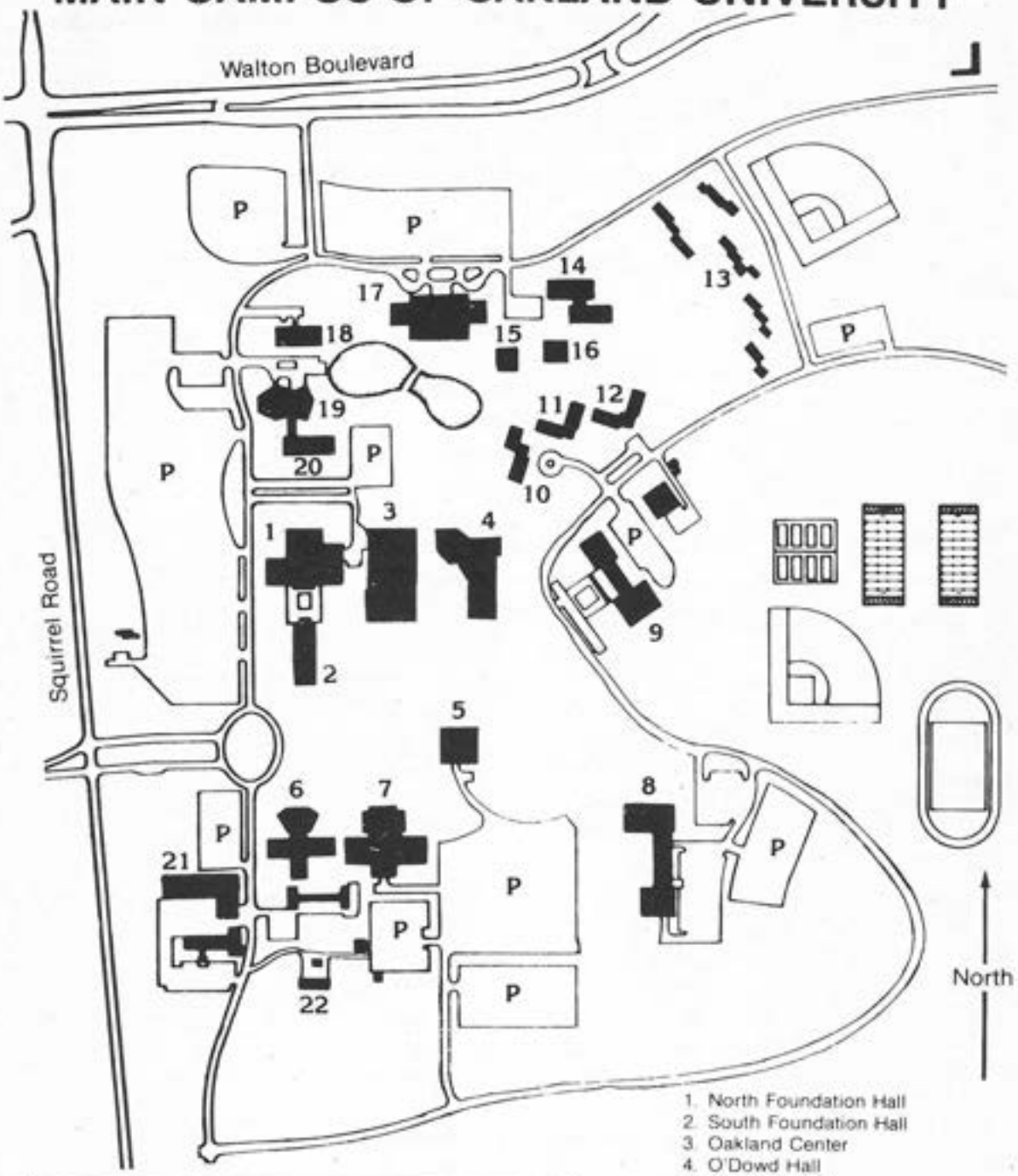

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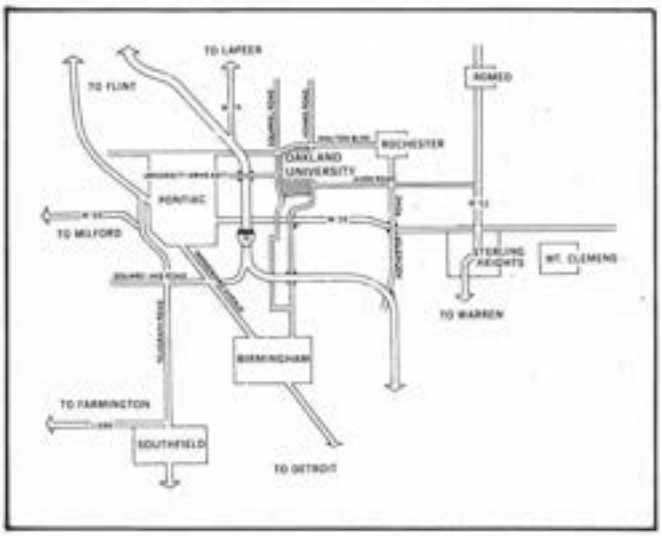

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