AN 282 The Prehistoric Origins of Civilization (4)
The development and spread of culture in the period before written history, using archaeological evidence from Neolithic Old World and New World sites. Cultural evolution from early farming and settlement to the rise of complex civilization.
Prerequisite: AN 101.

AN 300 Culture, Society and Technology (4)
Technology has played a critical role in all human evolution. This course provides a historical overview of the ways in which culture has shaped technology and how technology changes cultures. It emphasizes the impact of technology on modern cultures, especially technology emanating from the Western industrial revolution. *Satisfies the university general education requirement in social science.*

AN 302 Anthropological Research Methods (4)
Training in: research information storage and retrieval; field research instrumentation (photography, cinematography, video and audio recording, field computers); use of archives and data banks; plus participant observation, ethnomethodology and semantic analysis.
Prerequisite: AN 102 or SOC 100.

AN 305 The Life Course in Anthropological Perspective (4)
Socialization from infancy to old age will be considered with examples drawn from a variety of non-industrial societies as well as the literature on primates. Theories of human development across cultures will be viewed in light of this evidence. Identical with WS 305.
Prerequisite: AN 102 or WS 200.

AN 307 Culture and Society Through Film (4)
The systematic study of selected peoples from different cultures through the ethnographic film and appropriate readings, lectures and discussions. Students learn to evaluate cultural data according to various anthropological concepts and methodologies. *Satisfies the university general education requirement in social science.*
Prerequisite: Junior standing or permission of instructor.

AN 308 Native American Art (4)
Identical with AH 308. *Satisfies the university ethnic diversity requirement.*
Prerequisite: 4 credits in art history.

AN 309 Pre-Columbian Art (4)
Identical with AH 309. *Satisfies the university ethnic diversity requirement.*
Prerequisite: 4 credits in art history or IS 250.

AN 310 Psychological Anthropology (4)
Focuses on the relationship of culture and the individual; considers personality, perception, dreams, and other areas of psychological functioning in cross-cultural perspective and in relation to culture and personality theory.
Prerequisite: AN 102.

AN 315 Studying Our Culture: Technique and Analysis (4)
The different ways that people in different cultures and subcultures have of seeing their experiences. The anthropologist's methods of studying and analyzing these differences. Includes field work practice.
Prerequisite: AN 102 or SOC 100 or PSY 100.

AN 320 Law and Society (4)
Identical with SOC 320.
Prerequisite: SOC 100 or AN 102.

AN 322 Subsistence and Technology in Nonindustrial Society (4)
Technologies of different cultures; implications for the individual, society and cultural survival; ecology of tribal, peasant and industrial cultures with emphasis on subsistence technology of non-Western cultures.
Identical with ENV 322.
Prerequisite: AN 102.

AN 331 Racial and Ethnic Relations (4)
Identical with SOC 331. *Satisfies the university ethnic diversity requirement.*

AN 333 Medical Anthropology (4)
Interaction between biological, ethnopsychiatric and sociocultural environments in health, illness and treatment. Includes historical, organizational, demographic, ecological and other problems in health care delivery.
Prerequisite: AN 102 or SOC 100 or PSY 100 or HBS 200.

AN 337 Women's Lives in Cross-Cultural Perspective (4)
The lives of women in a variety of tribal and peasant societies, noting how beliefs, rituals and taboos shape the stages of the female life course and how culture influences women's reproductive and economic roles. Identical with WS 337.
Prerequisite: AN 102 or WS 200.

AN 361 Peoples and Cultures of India (4)
A survey of contemporary society and culture on the Indian subcontinent, with focus on India, Pakistan and Bangladesh; emphasis on social structure, folk religion and the problems of socio-cultural change.
Prerequisite: AN 102 or IS 240.

AN 362 Peoples and Cultures of China (4)
An anthropological study of China, stressing the variety of cultural and ecological adaptations characteristic of that complex society.
Prerequisite: AN 102 or IS 210.

AN 370 Archaeology of Mesoamerica (4)
The pre-Hispanic culture of Mexico and Guatemala, the Aztecs and Mayas, and their neighboring and derivative cultures. Detailed discussion of the major archaeological sites.
Prerequisite: AN 101 or 102.

AN 371 Peoples and Cultures of Mexico and Central America (4)
Anthropological studies of Indian and Mestizo societies in Mexico and Guatemala, including their separate socio-economic patterns and their integration into a dualistic social system.
Prerequisite: AN 102 or IS 250.

AN 372 Indians of South America (4)
A survey of the native South Americans. Includes warriors of the jungles, peasants and herders of the mountains, nomads of the plains and forests, and subsistence fishermen of the southern coasts.
Prerequisite: AN 102 or IS 250.

AN 374 Cross-Cultural Communication (4)
Satisfies the university ethnic diversity requirement. Identical with ALS 374.

AN 375 Language and Culture (4)
Satisfies the university ethnic diversity requirement. Identical with ALS 375.

AN 380 Archaeology of North America (4)
The evolution of native North American cultures (including Mesoamerica) from 50,000 B.C. to 1500 A.D., with emphasis on the ecological factors in the development of culture areas.
Prerequisite: AN 101.

AN 381 Peoples of North America: Indians and Inuit (Eskimos) (4)
The culture of certain North American societies and their adaptation to Western contact. *Satisfies the university ethnic diversity requirement.*
Prerequisite: AN 102.

AN 382 Advanced Physical Anthropology (4)
The emergence and diversification of the human species in relation to the morphology and ecology of both modern and fossil man, including physical and physiological variation (sex, race and age), climatic adaptation and population genetics.
Prerequisite: AN 101.

AN 383 Methods in Anthropological Archaeology (4)
Instruction and field research, including site location, excavation and artifact analysis, and conservation. May be repeated once for credit.
Prerequisite: AN 101.

AN 391 Primate Behavior (4)
Various bio-social factors that aid the nonhuman primates in their adaptation to the environment, implications for human behavior, classroom discussions and field studies.
Prerequisite: AN 101 or 102 or PSY 100 or SOC 100 or HRD 301.

AN 392 Current Problems in Anthropology (2 or 4)
Seminar in which a topic or problem is studied in depth. Each seminar requires independent readings and writing.
Prerequisite: Permission of instructor.

AN 399 Field Experience in Anthropology (4)
Field experience in anthropology with faculty supervision. An academic project related to the departmental discipline which incorporates student performance in an occupational setting. May not be repeated for credit.
Prerequisite: 16 credits in anthropology, of which at least 8 must be at the 300/400 level, and permission of instructor.

AN 400 Theories of Society and Culture (4)
The major theoretical foundations of modern sociology. Identical with SOC 400.
Prerequisite: AN 102 or SOC 100.

AN 401 Social Anthropology (4)
Examines social structure and social organization in anthropological perspective. Entails the study of economic, political, religious and kinship systems in the social life of man.
Prerequisite: AN 102.

AN 410 Human Adaptation (4)
Examines current theory on the cultural and biological adaptation of human groups to natural and social environments. Identical with ENV 410.
Prerequisite: AN 101, 102 or 322.

AN 420 Clinical Anthropology (4)
Explores cross-cultural explanations of illness and "deviant" behavior from both patients' and healers' perspectives, using case studies, films and the guest presentations of practitioners. It stresses the anthropological contribution to therapeutic strategies in the treatment of physical and mental illness.
Prerequisite: Three sociology or anthropology courses.

AN 430 Systems of Wealth and Power in Anthropological Perspective (4)
Concepts and methods of political and economic anthropology, emphasizing the interrelated state of political and economic phenomena, with particular reference to preindustrial, non-Western societies.
Prerequisite: AN 102.

AN 480 Independent Study and Research (2 or 4)
A tutorial in which the student will pursue a course of reading and research with the instructor. May be repeated only once for credit.
Prerequisite: Permission of instructor.

AN 497 Apprentice College Teaching (2 or 4)
Supervised participation in teaching an undergraduate course in anthropology, combined with readings and discussion of teaching objectives and methods appropriate for anthropological presentation. May be taken only once for credit toward a major.
Prerequisite: Senior anthropology major and permission of instructor.

SOCIOLOGY

SOC 100 Introduction to Sociology (4)
Introduction to the basic concepts of sociology relating to the study of people as participants in group life. Particular attention is given to culture, socialization and self development, social class, and major social institutions. *Satisfies the university general education requirement in social science. Also satisfies the university ethnic diversity requirement.*

SOC 190 Current Issues in Sociology (4)
Designed for the general student, this course will examine issues of current interest in sociology. The topic will be announced at the time of the offering.

SOC 202 Introduction to Methods of Social Research (4)
The collection, organization, analysis and interpretation of social data; elementary techniques of understanding and using quantitative evidence in sociological research. Strongly recommended as prerequisite for SOC 204.

SOC 204 Using Computers in Social Research (4)
This laboratory course provides students with hands-on experience in computing activity, including mainframe and microcomputers, and is designed to show how computers are used in social research. Statistical software packages will be used. Graded S/U. Recommended prerequisite: SOC 202.

SOC 205 Current Social Problems (4)
Presents sociological approaches to analyzing social problems. Particular attention is given to evaluation of the causes and consequences of social problems, as well as of their proposed solutions.

SOC 206 Self and Society (4)
Examines the reciprocal relationship between the individual and the group. Emphasizes the social roots of human nature, the self, social interaction, definitions of reality, socialization and social character. *Satisfies the university general education requirement in social science.*

SOC 240 Sociology of Crime and Punishment (4)
An introduction to the study of crime and the system of criminal justice in the United States. Provides an overview of different theories of crime, the production of crime statistics, types of offenses, the role of the police, courts and correctional agencies, and public policy. Also includes a comparison of street crime with white-collar crime. *Recommended for all students in the social justice and corrections concentration.*
Prerequisite: SOC 100.

SOC 300 Alcohol, Drugs and Society (4)
An overview of the sociology of substance use and abuse. Includes a review of sociological perspectives, social control of alcohol and drugs, descriptions of alcohol/drug behavior and treatment programs. Also explores ways in which substance abuse problems can be addressed by policy makers, health care professionals and practitioners in the field of substance abuse.
Prerequisite: SOC 100.

SOC 301 Social Stratification (4)
The concepts of class, caste and race in relation to social conflict and social integration. Students will study these problems in a cross-cultural perspective, emphasizing comparative materials.
Prerequisite: SOC 100.

SOC 303 Social Statistics (4)
Interpretation of social data by quantification and statistical reasoning.
Prerequisite: Two years of high school mathematics.

SOC 305 Sociology of Religion (4)
An analysis of the social components of religious experience, meaning and behavior; emphasis on the relationship between organized religions and other social institutions and such processes as conversion, commitment, sectarianism, accommodation and secularization. Identical with REL 305.

SOC 308 Population Dynamics (4)
Historical analysis of world population growth, focusing on relationships among population size, population policy, and social and economic development.
Prerequisite: SOC 100.

SOC 310 Introduction to Canada (4)
An interdisciplinary study of the peoples of Canada and their traditional and modern civilizations. Identical with IS 310.

SOC 314 Introduction to Social Work (4)
A study of the social work profession and the social context of welfare policies; the relationships between social structure and the development of social work practice; and public and private welfare organizations.
Prerequisite: SOC 100 or two courses in psychology or human resource development.

SOC 315 Social Welfare Policies (4)
Survey of the development of social welfare programs in the U.S. and internationally. Issues related to the problems of poverty, policy analysis and program evaluation related to social welfare in the U.S. and other countries are examined.
Prerequisite: SOC 100 or 314.

SOC 320 Law and Society (4)
Explores the concept of law and its expression in different societies and cultural contexts. The comparative development of legal institutions is studied in relationship to social structure. The organization of the legal system and profession is studied as related to the capacity of the law to affect behavior as an instrument of social control. Identical with AN 320.
Prerequisite: SOC 100 or AN 102.

SOC 323 Juvenile Delinquency and its Social Control (4)
Nature and types of juvenile delinquency, the relation of juvenile delinquency to the stress of adolescence and the specific social situation, methods of preventing delinquency or its recurrence.
Prerequisite: SOC 240.

SOC 324 Work and the Law (4)
Identical with LE 324.

SOC 325 Drugs, Crime and the Criminal Justice System (4)
The sociology of drugs, crime and the criminal justice system. Focuses on symptoms of community crime, criminalization, social control of alcohol/drugs, marginalization of drug users/abusers, legal issues and role of criminal justice system in crime control. Explores responses of policy makers, agents of social control and community agencies.
Prerequisite: SOC 100.

SOC 327 Police and Society (4)
A study of police techniques and problems, of deviant citizen-police relations, and of social control in a field where power is high and visibility is relatively low. Topics include the defenses against corruption and the containment concept of police.

SOC 328 Sociology of Health and Medicine (4)
The sociological study of medicine and the uses of sociology in medicine, definitions of health and illness, disease and death, health care occupations, medical malpractice, the organization of health services and trends in health and medicine.
Prerequisite: SOC 100.

SOC 330 The Sociology of Deviance (4)
An overview of the sociology of deviance, including theoretical approaches, the social construction of deviance, and contemporary empirical research.
Prerequisite: SOC 100.

SOC 331 Racial and Ethnic Relations (4)
A study of racial, ethnic and religious groups, particularly those of the U.S., emphasizing their historical development, problems of adjustment and assimilation and contemporary problems and trends. *Satisfies the university ethnic diversity requirement.* Identical with AN 331.
Prerequisite: SOC 100.

SOC 335 The Family (4)
A comparative and historical study of the family. Identical with WS 335.
Prerequisite: SOC 100 or WS 200.

SOC 336 Sociology of Gender (4)
The impact of ideological and technological change on the statuses, occupations and relationship of males and females. Identical with WS 336.
Prerequisite: SOC 100 or WS 200.

SOC 345 Urban Sociology (4)
The social structure, culture and ecology of early and contemporary urban communities; institutional responses to the problems of modern urban life.
Prerequisite: SOC 100.

SOC 346 Communities (4)
Focuses on the forms and functions of local communities, including neighborhoods and social networks. Both theoretical and applied implications of these structures for community organization and development are explored.
Prerequisite: SOC 100.

SOC 350 The Sociology of Work (4)
A study of how high technology, computers, and a shift in the economic base of employment are transforming work in contemporary society, why this is happening, and the social, psychological, political and cultural impact of change in the workplace.
Prerequisite: SOC 100.

SOC 352 Women and Work (4)
A sociological study of women's domestic and labor market activity in historical context, with emphasis on understanding the causes and consequences of sex segregation. Identical with WS 352.
Prerequisite: SOC 100 or WS 200.

SOC 353 Seminar in Socio-Technical Systems (4)
Introduces students to the growing field of inquiry that integrates the social and technical dimensions of work. Issues within the immediate, primary workplace, and the organization and social system that are related to the workplace are examined.
Prerequisite: One social science methods course.

SOC 354 Quality of Work Life (4)
How small groups in large organizations promote the personal growth of employees and achieve corporate goals of productivity. The use and abuse of employee involvement programs, the tension between personal development, corporate culture, and the ideology of worker/management relations.
Prerequisite: SOC 100.

SOC 357 Industrial Sociology (4)
The relationship between industrial and business organizations and the community; the study of occupations, labor unions, informal work groups and the character of American occupational life.
Prerequisite: SOC 100.

SOC 359 Human Factors in Quality Control (4)
Ways to attain quality in societies based on mass production. Examines underlying social principles and specific industrial practices that encourage quality production, particularly in large-scale manufacturing and service industries that are bureaucratically organized.
Prerequisite: One social science course; two years of high school math recommended.

SOC 371 Forms and Effects of Mass Communication (4)
Techniques of disseminating ideas and information through the mass media; evaluation of the effect of mass media on values of individuals and policies of institutions. Identical with COM 371.
Prerequisite: SOC 100 or sophomore standing.

SOC 373 Social Control of Mass Media (4)
The major sociological factors that control the informational content of the mass media; differences between the structures and processes of control in the print and electronic sectors of the media. Identical with COM 373.
Prerequisite: SOC 371.

SOC 376 Sociolinguistics (4)
Identical with ALS 376.

SOC 381 Theories of Modern Organizations (4)
Emphasizes degree to which modern society is based upon formal organization. Topics include: theories of human organization, as well as the study of bureaucracies, features of organizations and the effects of organization on American culture.

SOC 392 Current Problems in Sociology (2 or 4)
Seminar in which a topic is studied in depth. Each seminar requires independent readings and writing.
Prerequisite: Permission of instructor.

SOC 399 Field Experience in Sociology (4)
Field experience in sociology with faculty supervision. An academic project related to the departmental discipline that incorporates student performance in an occupational setting. May not be repeated for credit.
Prerequisite: 16 credits in sociology, of which at least 8 must be at the 300/400 level, and permission of instructor.

SOC 400 Theories of Society and Culture (4)
The major theoretical foundations of modern sociology. Identical with AN 400.
Prerequisite: SOC 100 or AN 102.

SOC 401 Survey and Interview Techniques (4)
Field interview techniques, questionnaire design, scaling and index construction, experimental and quasi-experimental designs, program evaluation techniques.
Prerequisite: SOC 202, 204.

SOC 402 Small Groups (4)
The study of small group relations and the informal understandings, codes and conventions that they generate. Considers dynamics of individuality, leadership, conformity and esprit de corps in a group setting. Identical with COM 402.
Prerequisite: SOC 100.

SOC 403 Computer Packages in Social Science (4)
Principles of packaged programs, with practice in data editing and analysis with SPSS (Statistical Package for the Social Sciences) and BMDP. Comparative merits of different packages.
Prerequisite: SOC 203 and 204 or equivalent.

SOC 412 Police Budgeting and Personnel Management (4)
Finance and resource allocation methods used by local and state police agencies. Topics include funding sources, expenditure patterns, resource allocation techniques and stakeholder influence. Identical with PS 412.

SOC 420 Research and Policy Evaluation in Criminal Justice (4)
Overview of problems of conducting research and policy evaluation in criminal justice agencies, including history of such research and "problem oriented" approach to policing.
Prerequisite: SOC 240.

SOC 425 Corrective and Rehabilitative Institutions (4)
Overview of prison and correctional systems in the United States. Includes reviews of the historical development of corrections and current issues in corrections, including sentencing practices, overcrowding, race relations, budget constraints, AIDS and substance abuse. Explores ways in which these problems are addressed by criminal justice practitioners.
Prerequisite: SOC 240.

SOC 430 Internship in Criminal Justice (2 or 4)
Field placement and supervision of students in police, prison, and parole organizations and agencies.
Prerequisite: Enrollment in criminal justice concentration and written permission of instructor.

SOC 437 Sociology of the Courts (4)
The roles of judges, court officers, jury and attorneys are described and analyzed in the context of their professional matrix.
Prerequisite: SOC 100 and 240.

SOC 455 Contemporary Work Roles, Careers and Labor Markets (4)
The social dimensions of occupational specialization in modern society. The impact of social and technological labor market changes in the supply and demand for workers in various occupations. Industrial and professional career patterns are studied in relationship to values, status, prestige, lifestyle, occupational satisfaction and job-related stress.
Prerequisite: SOC 100.

SOC 460 Political Sociology (4)
Sociological factors which influence distribution of power within a society: political communication, maintenance of political consensus, the revolution process, the structure of political parties and the emergence of new states.
Prerequisite: SOC 100.

SOC 465 Sociological Perspectives on Aging (4)
Recent sociological perspectives on aging: topics include status of persons approaching and past retirement age, family and community roles and relations, and occupational and political participation.
Prerequisite: SOC 100 and junior standing or above.

SOC 480 Independent Study and Research (2 or 4)
Directed individual reading and research.
Prerequisite: Permission of instructor.

SOC 497 Apprentice College Teaching (2 or 4)
Supervised participation in teaching an undergraduate course in sociology, combined with readings and discussion of teaching objectives and methods appropriate for sociological presentation. May be taken only once for credit toward a major.
Prerequisite: Senior sociology major and permission of instructor.

BIOCHEMISTRY PROGRAM

Coordinator: *Kathleen H. Moore (Chemistry)*

Biochemistry Committee: *Arthur W. Bull (Chemistry), Denis M. Callewaert (Chemistry), John D. Cowlishaw (Biological Sciences), Arik Dvir (Biological Sciences), Anne L. Hitt (Biological Sciences), Michael D. Sevilla (Chemistry), Satish K. Walia (Biological Sciences)*

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 a career in biochemical research, graduate study in biochemistry or molecular biology, or professional education in medicine, dentistry or other health sciences.

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, equipment for gas and high pressure liquid chromatography, and GC/MS, UV-vis, fluorescence, NMR, EPR, laser Raman, and atomic absorption spectrometers. Recent biochemical instrumentation acquisitions include a flow cytometer, a radioisotopic image analyzer, and high performance capillary electrophoresis system.

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 metabolism, gene expression, hormone action, immunochemistry, molecular biology and radiation biochemistry. The minimum requirement for a B.S. in biochemistry is 124 credits, including course work in biological sciences (16 credits), chemistry (32 credits) and biochemistry (12 credits) as detailed below. No more than 8 credits of course work used to fulfill the requirements of a major or minor in biology or chemistry may be used to fulfill the requirements of a major in biochemistry.

Admission to major standing

Students may apply for major standing after completion of 18 credits of chemistry and at least 8 credits of biology from the requirements listed below, with a grade point average (GPA) of at least 2.50 in those courses. The biochemistry committee must approve major standing and a detailed plan of study at least three semesters prior to graduation.

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. Sixteen or more credits of biology chosen in consultation with the biochemistry program coordinator from the following courses: BIO 111, 113, 319, 320, 321, 322, 323, 324, 341, 345, or 393. Other appropriate courses may be approved on an individual basis.
2. Thirty-two credits of chemistry, including CHM 157 - 158 (or 167 - 168), 234-235, 237, 325, 342, and 343.
3. Twelve or more credits of biochemistry including BCM 453, 454, and 457 and additional credits selected from the following courses: BIO 407, 423, 439, 440, 441; CHM 458, 553, 581; or BCM 490.

4. Corequisites in mathematics (MTH 154 and 155) and physics (PHY 151 and 152). STA 226 and either CHM 220 or CSE 125 are recommended electives.
5. Admission to major standing as described above at least three semesters prior to graduation.

Program Honors

Program honors may be granted to graduating seniors in biochemistry on the basis of high academic achievement (minimum 3.60 overall grade point average) and excellence in biochemical research at Oakland University.

Concentration in preprofessional studies in medicine, dentistry and optometry

The Bachelor of Science degree with a major in biochemistry provides students with all the requirements for a concentration in preprofessional studies with the exception of PHY 158, which needs to be completed. The Bachelor of Science degree and the Bachelor of Arts degree with a major in chemistry provide students with all the requirements for a concentration in preprofessional studies with the exception of PHY 158, which must be completed, and five courses in biology/biochemistry. Students interested in a medical career should refer to the concentration in preprofessional studies in medicine, dentistry, optometry and veterinary medicine *(Other Academic Options)* and consult with the biology or biochemistry adviser and with the preprofessional studies adviser.

Course Offerings

The program offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

BCM 453 Biochemistry I (3)
First course in a comprehensive biochemistry sequence. Structure and function of proteins, carbohydrates and lipids. Enzyme mechanisms, kinetics and regulation. Bioenergetics and catabolism. Identical with CHM 453.
Prerequisite: CHM 235.

BCM 454 Biochemistry II (3)
Metabolic pathways and control. Nucleic acid structure, function and processing, including regulation of gene expression. Selected topics in molecular physiology. Identical with CHM 454.
Prerequisite: BCM/CHM 453.

BCM 457 Biochemistry Laboratory (2)
Techniques of extraction, separation, identification and quantification of biomolecules, including electrophoresis, chromatography and radioisotope techniques, with emphasis on mathematical treatment of experimental data. Identical with CHM 457.
Prerequisite or corequisite: BCM/CHM 453.

BCM 490 Biochemistry Research (1, 2, 3 or 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 curricula prepare students for a variety of professional opportunities in government as well as the private sector, and for graduate study in such fields as toxic substance management, public health, toxicology, pharmacology, 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 in the work place, toxic substance regulations, applied ecology, pollution prevention, air resources, water resources and public environmental policy.

Requirements for the B.S. degree

To earn a Bachelor of Science degree with a major in environmental health, students must complete a minimum of 128 credits:

1. An introductory prerequisite core of a minimum of 34 credits, to be completed with a 2.00 average before major standing is awarded, including BIO 111; CHM 157 (or 167); 158 (or 168); PHY 151, 152 (or, for students not considering graduate work, PHY 101 and 102) and 8 credits in mathematics above MTH 121 or 141, usually including STA 225. MTH 154 is strongly recommended (MTH 155 is recommended for students considering graduate education).
2. Major standing to be awarded three semesters before graduation, and before a student achieves senior status, otherwise graduation may be delayed.
3. A program of a minimum of 54 credits in advanced courses, including CHM 325 and ENV 308 plus courses required by one of the three specializations, *which must be approved by the program director*. 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. Except for ENV courses, no more than 24 credits in any one course rubric (such as BIO, CHM, etc.) may be used to fulfill the major. At least 16 of the credits taken at the 300 level or above must be taken at Oakland University.
4. Completion of one of the specializations described below. Students desiring to complete two specializations must take 16 credits of non-duplicative course work.

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 321; CHM 234-235; ENV 355, 386, 387, 388, 474, 484 and IHS 311.

Recommended electives include BIO 301; CHM 453; ENG 381 or 382; ENV 364, 372, 373, 452, 461, 470, 486; and PS 353.

Elective courses for the specialization must be approved by the program director.

Specialization in environmental and resource management

This option emphasizes the wise use of resources, especially as they affect human health and well-being. Program electives offer training for a variety of field and laboratory opportunities in industry and government, including planning, resource management, environmental protection and public policy.

Required course work includes ENV 355, 461; BIO 301 and PHY 158.

Recommended electives include BIO 207 or 321, 303, 311, 307 or 319, 327, 333, 373, 375, 407, 481; CHM 234-235; ENG 381 or 382; ENV 322, 368, 372, 373, 386, 470, 484, 486; HST 384; ME 407; PS 302, 305, 350, 353.

Elective courses for the specialization must be approved by the program director.

Specialization in toxic substance control

This option is designed to provide training for professional opportunities in environmental toxicology, environmental health chemistry, and 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 BIO 301; CHM 234-235; BIO 325 or CHM 453; ENV 461, 484 and 486.

Recommended electives include BIO 207 or 321, 375; CHM 454, 581; ENG 381 or 382; ENV 364, 368, 372, 373, 386, 387, 388, 452, 470, 474 and PS 302, 353.

Elective courses for the specialization must be approved by the program director.

Requirements for the liberal arts minor in environmental health

The following 19 credits are required for this minor: ENV 308, 355, 372 or 373 or 452, 368 or 461, 484 and 486. An approved Concentration/Minor Authorization Form must be filed three semesters prior to graduation.

Course Offerings

The program offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

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 311 Global Environmental Pressures (4)
An interdisciplinary approach to selected problems of environmental stress in major ecosystems of the world. Emphasis is on the Third World's natural resources, in relation to their export to the industrialized societies. *May be used in lieu of one of the College of Arts and Sciences' distribution categories.*

ENV 312 Energy and the Environment (4)
Basic facts of energy: sources, forms, the roles it plays, and its ultimate fate. 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 011 level.

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

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 364 Hazardous Materials Emergency Response (3)
Review of standard operating procedures when dealing with responses to hazardous materials incidents. Planning procedures, policies and application of procedures for incident levels, personal protective equipment, decontamination, safety, communications and governmental reporting are stressed.
Prerequisite: Junior standing in environmental health.

ENV 368 Fundamentals of Hazardous Materials Regulations (3)
An introduction to the regulations governing the manufacture, use, storage, transportation, treatment and disposal of hazardous materials. Related management issues of liability, compliance, ethics, assessment, remediation and clean-ups will be discussed.
Prerequisite: Junior standing in environmental health; ENV 386 recommended.

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 humans. Some discussion of air pollution control will be included.
Prerequisite: CHM 158 (or 168).

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 158 (or 168) and junior standing.

ENV 386 Principles of Occupational Health (3)
Recognition, evaluation and control of chemical and physical stresses in the workplace that may adversely affect human health.
Prerequisite: Junior standing in environmental health; BIO 113, CHM 234; physics is desirable.

ENV 387 Industrial Hygiene Field Survey (3)
Selected subjects of current interest in occupational and environmental health and review of occupational health programs at local industrial companies through site visits.
Prerequisite: ENV 386.

ENV 388 Occupational Health Control Methods (3)
Theory and practice in the control of occupational health hazards, including personal protective equipment, noise, radiation, ventilation and engineering design.
Prerequisite: ENV 386.

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.
Prequisite: Permission of instructor.

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

ENV 452 Pollution Prevention (3)
Problems of air and water pollution, solid waste management, hazardous material handling, life cycle analyses and pollution control examined from several viewpoints. Solutions to pollution problems, control technologies, practical aspects and compliance with regulations.
Prerequisite: Junior standing in environmental health, CHM 158 (or 168).

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 Environmental Health Internship (2)
Supervised practical experiences in a variety of environmental health settings. Graded S/U.
Prerequisite: Senior standing in environmental health and permission of instructor.

ENV 474 Industrial Hygiene Monitoring Methods (3)
Sampling and analysis of occupational health hazards and evaluation of the effectiveness of industrial hygiene control methods in laboratory and field locations.
Prerequisite: ENV 386.

ENV 484 Environmental Toxicology (3)
Principles of toxicology applied to a variety of biological systems: exposure, toxokinetic, and toxodynamic phases; dose-effect relationships; factors influencing toxicity. Environmental partitioning, pathways, transformations and fate.
Prerequisite: BIO 111, 113; CHM 235; biochemistry desirable.

ENV 486 Toxic Substance Control (3)
Quantification and management of toxic substances, including production, use, distribution, exposure and control. Risk assessment and regulatory strategies will be emphasized.
Prerequisite: BIO 111, 113; CHM 234.

OTHER ACADEMIC OPTIONS

The minors, concentrations and programs offered in this section are interdisciplinary in nature and are attractive additions to many degree programs in the university. They are available to all students in the university. A student wishing to pursue any of these minors, concentrations and programs should consult with the coordinator listed with each program and should file a Concentration/Minor Authorization Form where appropriate.

Concentration in American Studies

Coordinator: *Jane D. Eberwein (English)*

Committee: *Sheldon L. Appleton (Political Science), James W. Dow (Anthropology), Roy A. Kotynek (History), Bruce J. Mann (English), David W. Mascitelli (English), Janice Schimmelman (Art History), Richard B. Stamps (Anthropology), 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 AMS 300, 401, one course in anthropology (preferably AN 315), one American history course at the 300 level and three electives from the courses listed as electives in the current catalog. No more than two electives may be taken from any one department's offerings, and at least one must represent a field or fields outside the student's major. (Those majoring in anthropology or history should be aware that no more than 8 credits may be counted toward both the major and a concentration.) Students interested in pursuing this concentration should file a plan of study with the coordinator.

Recommended departmental electives

Art and Art History	AH 350, 355
English	ENG 112, 224, 302, 317, 318, 319, 324, 332, 341, 342
History	HST 114, 115, 292, 301, 305, 311, 312, 313, 314, 315, 316, 317, 319, 323, 360, 361, 362
Linguistics	LIN 303
Music	MUS 335
Political Science	PS 100, 115, 203, 300, 301, 302, 305, 307, 323, 324, 326, 327, 341, 342, 371
Sociology/Anthropology	SOC 100, 205, 315, 331, 357, 373; AN 315, 380, 381

Some 300- and 400-level topics courses offered by contributing departments may also be included in the concentration, with permission of the American studies coordinator.

Course Offerings

The concentration offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

AMS 300 American Culture (4)
An interdisciplinary approach to American culture through examination of several pervading themes (such as manifest destiny, the American dream of success, and tensions between individualism and community). May be used in lieu of one of the College of Arts and Sciences' distribution categories. Prerequisite: Writing proficiency (may be waived by the concentration coordinator in the case of foreign students). *Satisfies the university ethnic diversity requirement.*

AMS 401 Senior Project (4)
Either an independent research project or an internship in American studies. Plans for this project must be developed with the concentration coordinator the semester before the student registers for this course. Prerequisite: AMS 300.

Concentration in Applied Statistics

Coordinator: *Robert H. Kushler (Mathematical Sciences)*

Committee: *Keith A. Berven (Biological Sciences), William E. Bezdek (Sociology and Anthropology), Gerard R. Joswiak (Computer Services), Anandi P. Sahu (Economics), Robert M. Schwartz (Education), Ronald E. Olson (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 251, SOC 303, 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 the coordinator or 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. A minimum of 28 credits are required for this program:

1. AH 100, AN 101 and 222
2. One of the following: AH 310, 312, 314; AN 282, 370, 371 or 380
3. 8 credits in field methods (AN 383)

4. At least 4 elective credits. The following courses are recommended for those who wish to expand their background: AH 322, 326; HST 261, 306, 367 and PHY 107.

Students are reminded that professional conservation work requires knowledge in botany and chemistry. Students wishing to enroll in the archaeology concentration should file a minor and concentration authorization form with the coordinator.

Minors in Computer Science and Computing

Coordinator: *Subramaniam Ganesan (Computer Science and Engineering)*

The School of Engineering and Computer Science offers the following two minors, which are available to students in the College of Arts and Sciences.

The *minor in computer science* is suitable for students with majors in mathematics, physics, chemistry or biology, who may wish to emphasize numerical, scientific and engineering aspects of computing.

The *minor in computing* is suitable for students with majors in English, history, modern languages, philosophy, psychology, sociology or anthropology, who may wish to take courses that emphasize non-numerical and symbolic data processing and language translation. With a major in economics, a student may wish to take courses oriented toward application of computers in management data processing.

For specific requirements for each of these minors, see the Department of Computer Science and Engineering section of this catalog.

Concentration in Criminal Justice

Coordinator: *Albert J. Meehan (Sociology)*

The concentration in criminal justice 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 law, 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. On occasion, courses related to criminal justice may be offered as special topics courses or seminars by participating departments and count for concentration credit. These courses will be identified by the concentration director. Appropriate transfer courses also may be accepted for credit when they meet university equivalency requirements. Students should consult with the concentration director to determine how these courses may fulfill credit requirements.

A student must be formally admitted to the program by meeting with the concentration director and must fufill the following requirements:

1. 12 credits chosen from PHL 319; PS 241, 342; SOC 240*, 327, 437
2. 12 credits from PHL 321; PS 343; PSY 322, 341, 343; SOC 300, SOC/AN 320, SOC 323, 325, 420, 425
3. 4 credits of SOC 430.

*Students are strongly advised to take this course at the beginning of their concentration.

The internship is designed to give students practical experience in the criminal justice or legal system. The student's particular interests guide the internship selection process. An internship usually involves work in an agency for 20 hours per week and meeting with the internship adviser on a regular basis. Students who qualify may receive paid internships. A term paper on some aspect of the internship experience is required in order to receive course credit. The internship is a valuable learning experience and should be taken toward the end of the concentration.

Concentration in Environmental Studies

Coordinator: *Paul Tomboulian (Chemistry)*

The concentration in environmental studies introduces students to the newer interdisciplinary perspectives needed to address today's environmental problems. Short-and long-range implications of human activities are analyzed, with emphasis on the technical and scientific issues.

Requirements for the concentration are a minimum of 28 credits in a planned and approved program of advanced courses, built on introductory work in biology, chemistry, mathematics and physics. Typically the 28 credits would include ENV 308 or 311, plus 16 credits of work at the 300 level or above selected from at least three rubrics. Advanced courses in many departments may be suitable for the concentration. In addition to ENV courses, these include, but are not limited to AN 410; BIO 301, 303, 311, 373, 375; EGR 407; HST 384; PS 350 and 353. At least 16 credits must be in non-duplicative course work with another major. A Concentration/Minor Authorization Form with an approved set of courses must be filed at least three semesters prior to graduation. Consult the program coordinator for details about course sequences and scheduling.

Concentration in Film Aesthetics and History

Coordinator: *Brian F. Murphy (English)*

Committee: *Bonnie Abiko (Art and Art History), Peter J. Bertocci (Anthropology), Andrea Eis (Art and Art History), Robert T. Eberwein (English), Sally M. Silk (Modern Languages and Literatures)*

The interdisciplinary concentration in film aesthetics and history, sponsored by the departments of Art and Art History; Center for International Programs; English; Modern Languages and Literatures; Rhetoric, Communication and Journalism; and Sociology/Anthropology, 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 examine 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.

A minimum of 28 credits is required, including:

1. Three courses chosen from CIN 150, ENG 250, LIT 251, and AH 367
2. ENG 392
3. Two courses chosen from CIN 300, 301, 302, 303
4. One course chosen from AN 307, CIN 350, 450 and COM 303.

In special circumstances, CIN 450 or 499 may be substituted for one of the courses listed above, with permission of the concentration coordinator.

Course Offerings

The concentration offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

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 and the university ethnic diversity requirement.*

CIN 300 History of Film: The Silent Era (4)
Survey of directors and films important in shaping film history: Griffith, Eisenstein, Chaplin, Murnau, 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 including such New Wave directors as Truffaut, and Godard, and major artists such as Bergman, Kubrick.

CIN 303 History of Film: Into the 21st Century (4)
A study of developments in film since the 1980s. Topics include Hollywood cinema, independent film-making, experimental films, third world cinema and various national themes, as well as such major artists as Campion and Lee.

CIN 350 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, Censorship.

CIN 450 Advanced Topics in Film (4)
Topics to be selected by instructor.
Prerequisite: A course in film or permission of 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 French Studies

Coordinator: *Sally Silk (Modern Languages and Literatures)*

The concentration in French studies provides an interdisciplinary understanding of French culture for students not majoring in French. Courses in French language, literature, civilization, art history and history are required.

In addition to providing students with a well-rounded background in the area of French studies, this concentration is also useful to students planning graduate work in French history or art history.

Course Offerings

The concentration offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

The concentration requires completion of a minimum of 28 credits, including 8 credits in French language, and 20 credits in courses conducted in English as follows.:

1. 8 credits of French language taken at Oakland University. Students must achieve minimally at the 215 level; students who place into FRH 215 will take 215 and 314; if they place higher than 215, they will take 314 plus 4 credits in a higher level course.
2. ML 390 and LIT 375 (both conducted in English)
3. 8 credits from the following history courses: HST 329, 345, 347, 348 and 349*

4. 4 credits in Art and Art History: AH 326 or AH 364. Other topic courses in art history may be substituted with permission of the concentration coordinator.

*Students must take either HST 101 or 102 as a corequisite for the concentration (either of which satisfies the general education requirement).

This concentration does not constitute a major. Students must elect a major from those offered by the university. Interested students should develop a program in consultation with the coordinator.

Concentration in Human and Industrial Relations

Coordinator: *Jacqueline R. Scherer (Sociology)*

The concentration in human and industrial relations requires a minimum of 28 credits and is to be taken in conjunction with a full major in any department of the university. It is basically a social scientific approach to the workplace in which research, analysis and social criticism are linked together in the examination of changing work patterns.

The following requirements apply to the concentration:

1. 12 credits chosen from: AN 300; SOC 350, 352, 357, 381
2. ECN 150 (or ECN 200 or 210)
3. HST 302
4. Two electives from the following: COM 304; HST 210, 304; LE/SOC 324; LE 326; PHL 316; PSY 333; SOC 354, 455; SOC/AN 480.

Concentration in Michigan Studies

Coordinator: *Richard B. Stamps (Anthropology)*

Committee: *Gottfried Brieger (Chemistry), John B. Cameron (Art 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 a minimum 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. Students wishing to enroll in the Michigan studies concentration should file a minor and concentration authorization form with the coordinator.

Course Offerings

The concentration offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

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 399 Field Experience in Art History
AN 383 Methods in Anthropological Archaeology
AN 399 Field Experience in Anthropology

BIO 373	Field Botany
ENV 373	Water Resources (3)
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

Concentration in Preprofessional Studies in Medicine, Dentistry and Optometry

Coordinator: *Keith A. Berven (Biological Sciences)*

Committee: *Denis M. Callewaert (Chemistry), Robert W. Jarski (Health Sciences), Virinder K. Moudgil (Biological Sciences), John R. Reddan (Biological Sciences), Robert L. Stern (Chemistry), Nalin J. Unakar (Biological Sciences)*

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), developmental biology (BIO 323, 324), biochemistry (BIO 325 and 326 or CHM 453, 454, 457 and 458) and physiology (BIO 321 or BIO 207).
2. Humanities: vocabulary and etymology (ALS 102) and/or RHT 120, 142 and 144. RHT 142 and 144 are suggested for improving reading comprehension skills in preparation for the MCAT.

Students intending to pursue a career in the optometry 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
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: *Gary Shepherd (Sociology-Anthropology)*

This concentration offers a series of courses about (or related to) religion, both Western and Eastern, traditional and contemporary. Course goals include understanding a pervasive human phenomenon in the same scholarly objective spirit as other academic courses rather than seeking to confirm or attack any particular religious point of view.

This concentration may be taken conjointly as part of 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* should contact the concentration coordinator for further information.

A minimum of 28 credits is required for the concentration in religious studies, distributed as follows:

1. REL 100 (4 credits)
2. Core studies: *Two* of the following (8 credits): REL 201, 301, 490
3. Field related studies: *Four* courses in a least *three* of the following five fields (16 credits):

Art	AH 302, 320, 322, 326
History	HST 324, 325, 327, REL 300
Literature	ENG 312, ENG 305/REL 311, REL 302
Philosophy	PHL 204, 205, PHL/REL 325, PHL/REL 350
Social Science	PSY 445 *(only when special topic is religion)*, AN/REL 271, SOC/REL 305.

Course Offerings

The concentration offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

REL 100 Introduction to Religion (4)
Critical, comparative study of both Western and Eastern religious traditions with emphasis on historical developments. Features methodological approaches taken by a variety of disciplines in studying religion. Includes guest presentations by representatives of these different approaches.

REL 201 Introduction to Sacred Texts (4)
Explores the various roles played by sacred texts within both Western and Eastern religious traditions. Core texts from these traditions are analyzed and compared, revealing the basic approaches to religious life contained in each.

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

REL 300 Topics in the Historical Study of Religion (4)
Topics vary, but could include the following: the New Testament, medieval mysticism, early Buddhism, the Protestant Reformation, Christ and Caesar, and the 18th and 19th century attacks on religion. May be repeated for additional credit.

REL 301 Religion in the Modern World (4)
Focuses on the problem of religious life and discourse in the context of modern critical thought and an increasingly pluralistic and secular world. Emphasizes the rise of new religions, the sources and consequences of religious ethnocentrism, and the struggles of religion to establish/maintain social legitimacy.

REL 302 Religion and Literature (4)
Study of world religious literature. May include Greek tragedy, Hindu epics, Dante and Milton. Will treat both use of religious themes in literature and about literature as an expression of religious belief.

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

REL 311 The Bible as Literature (4)
Satisfies the university general education requirement in literature. Identical with ENG 305.

REL 325 Philosophy of Religion (4)
Identical with PHL 325.

REL 350 Philosophies and Religions of Asia (4)
Identical with PHL 350.

REL 490 Directed Readings in the Religious Studies (4)
Individual study of topic(s) not covered in available courses. May be repeated for additional credit. Prerequisite: REL 100, 201 and permission of concentration coordinator.

Concentration in Social Work

Coordinators: *Jacqueline R. Scherer (Sociology) and Lynetta Mosby (Sociology)*

The concentration in social services requires a minimum of 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 work 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. Any two psychology courses numbered at the 300 level or higher
3. Field experience: Choose one from: PSY 371, 399; SOC 399 or equivalent course
4. Statistics: SOC 303 or approved alternative course (e.g., PSY 251; STA 225 or 226)
5. One elective from the following: AN 305, 310; COM 385; PS 359; SOC 300, 328, 331, 335.

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

Committee: *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 a minimum of 28 credits, distributed as follows:

1. Core — three of the following four courses: ECN 309, HST 301, PS 305, SOC 345
2. Electives — four 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; HRD 364; HST 302; PS 307, 350, 353; SOC 315, 331
3. 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.

Concentration in Women's Studies

Coordinator: *Susan M. Haworth-Hoeppner (Sociology and Anthropology)*

Committee: *Lizabeth Barclay (School of Business Administration), Natalie Cole (English), Kevin Early (Sociology and Anthropology), Michelle Piskulich (Political Science), Mary Van Sell (School of Business Administration), Martha Zingo (Political Science).*

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.

A minimum of 28 credits are required for the concentration in women's studies, distributed as follows:

1. WS 200 (4 credits)
2. Three women's studies courses (12 credits) with numbers of 300 and above, excluding WS 399 and 400. The content and instructor for WS 301 Special Topics, and WS 401 Advanced Topics in Women's Studies, change from semester to semester; therefore, students may receive credit for more than one WS 301 and 401 class provided they are cross-listed with different courses. Students can receive credit toward the concentration for a course taken under the departmental rubric if it is cross-listed with women's studies during that semester; students may not receive double credit for the same course taken under the WS rubric and the departmental rubric.
3. Three additional women's studies courses (12 credits) or 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

The concentration offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

WS 101 Introductory Topics in Women's Studies (4)
Course content varies.

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. May be used in lieu of one of the College of Arts and Sciences' distribution categories.

WS 201 Topics in Women's Studies (4)
Course content varies.

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 have included: gender, ethnicity and representation; black women in America; women in German literature and culture.

WS 305 Anthropological Perspectives on the Life Cycle (4)
Identical with AN 305.

WS 311 Women and Politics (4)
Identical with PS 311.

WS 322 Women in Modern America (4)
Identical with HST 322.

WS 335 The Family (4)
Identical with SOC 335.

WS 336 Sociology of Gender (4)
Identical with SOC 336.

WS 337 Women's Lives in Cross-Cultural Perspective (4)
Identical with AN 337.

WS 351 Women in Art (4)
Identical with AH 351.

WS 352 Women and Work (4)
Identical with SOC 352.

WS 361 History of American Families (4)
Identical with HIS 361. *Satisfies the university ethnic diversity requirement.*

WS 362 History of African-American Women (4)
Identical with HST 362. *Satisfies the university ethnic diversity requirement.*

WS 374 Psychology of Women (4)
Identical with PSY 374.

WS 375 Women in Modern East Asia: Holding Up Half the Sky (4)
Identical with HST 375.

WS 399 Field Experience in Women's Studies (4)
Field experience in women's studies with faculty supervision. An academic project involving field work or community activism around an issue of importance in women's studies. May not be repeated for credit. Prerequisite: WS 200 and 12 credits in women's studies or approved women's studies electives.

WS 400 Directed Research in Women's Studies (2, 4)
Directed individual study and advanced scholarly research 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.

WS 481 Gender Socialization in Schools (4)
Identical with EED 481 and CIL 561.

Prelaw Studies

Students planning to attend law school after graduation must select a major in addition to the preprofessional studies designation, prelaw studies. Students should choose a major in which they have both interest and aptitude; the particular major is less important for admission to law school than the overall success in courses chosen. Success is generally measured by the cumulative grade point average and the score on the Law School Admission Test (LSAT).

Rather than mastery of any particular subject matter, law schools require that incoming students possess certain basic skills. These skills include critical reasoning and the ability to write and speak in a coherent and precise manner. Students are advised to select rigorous course work aimed at developing strong reading, writing and reasoning skills; and to plan undergraduate course work with an eye toward long-term plans within the legal profession.

Because there is no set of specific courses necessary for admission to, or success in, American law schools, there is no formal prelaw curriculum at Oakland University. Students are directed to consider courses in three categories as described below and to choose courses which they believe will help them to develop skills or acquire knowledge which may be beneficial during or after law school. None of these courses are required or necessarily recommended for all prelaw students.

1. The development of fundamental abilities of reasoning and written communication. Although most introductory courses in all of the liberal arts disciplines serve this purpose, particularly relevant courses are: COM 207, ENG 380, PHL 102 and 103, RHT 144, 380.
2. Oral communication. The following courses are recommended: COM 201, 220, 301, 318 and THA 110.
3. The law in relationship to other disciplines. Suggested courses are: ECN 378; ENV 461; JRN 403; MGT 350; PHL 316, 318, 319; PS 241, 341, 342, 343, 440, 441; SOC/AN 320; SOC/LE 324 and SOC 437.

Students are cautioned against overemphasizing law-related courses in their undergraduate training. Law schools virtually never give credit for these courses, either for placement or graduation, and are inclined to believe an education featuring these courses to be too narrow in scope. 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 are required of, or restricted to, prelaw students.

Students interested in a career in law should meet with an academic adviser to discuss course selection and admission procedures. Advising is available through either Cheryl A. Sullivan in the College of Arts and Sciences Advising Office or Martha T. Zingo in Political Science.

Premedical studies

Students who plan to attend medical school upon graduation and who entered the college in the premedical studies curriculum must select a major in addition to this preprofessional studies designation. Students planning a career in the medical professions (medicine, dentistry, optometry and veterinary medicine) will find that a major in biology, biochemistry or chemistry, combined with the concentration in preprofessional studies provides excellent preparation for admission to the various medical schools in Michigan and elsewhere.

Students should consult with Keith Bervin, preprofessional concentration coordinator, or any of the faculty listed with the concentration, and with an adviser in the College of Arts and Sciences Advising Office for assistance in planning their programs.

Liberal Arts Minor in Science

Coordinator: *William A. Macauley (College of Arts and Sciences)*

The liberal arts minor in science requires at least 27 credits for the two-science minor, or 29 credits for the three-science minor, selected from courses in biological sciences, chemistry and physics.

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

Two-science minor

1. Complete at least two of the following course sequences: BIO 111, 113 and 116; CHM 157-158 (or 167-168); or PHY 101, 102 (or 151, 152) and 158.
2. Complete at least 8 additional credits from either one science or split between the two sciences. Biology and chemistry courses numbered lower than BIO 111 and CHM 144, respectively, do not apply to the science minor (nor do CHM 201, 300 and BIO 300).

Three-science minor

Complete the following: BIO 111, 113 and 116; CHM 157-158 (or 167-168); and PHY 101, 102 (or 151, 152) and 158.

Geography Course Offerings

The following courses offered under the geography rubric are available only to students fulfilling requirements for the elementary education teaching minor in social studies. Students in other programs may register for these courses under the home department rubric as indicated below.

GEO 106 Earth Sciences (4)
Identical with PHY 106. *Satisfies the university general education requirement in the natural sciences.*

GEO 107 Physical Geography (4)
Identical with PHY 107. *Satisfies the university general education requirement in the natural sciences.*

GEO 200 Global Human Systems (4)
Provides an introductory survey of the worldwide distribution, variation and interconnections of cultural, economic and political systems. Basic concepts in the field of human geography and other social sciences, as relevant, will also be introduced.
Identical with AN 200 and IS 200.

GEO 210 Introduction to China (4)
Identical with IS 210. *Satisfies the university general education requirement in international studies.*

GEO 220 Introduction to Japan (4)
Identical with IS 220. *Satisfies the university general education requirement in international studies.*

GEO 230 Introduction to Africa (4)
Identical with IS 230. *Satisfies the university general education requirement in international studies.*

GEO 250 Introduction to Latin America (4)
Identical with IS 250. *Satisfies the university general education requirement in international studies.*

GEO 270 Introduction to the Middle East (4)
Identical with IS 270. *Satisfies the university general education requirement in international studies.*

SCHOOL OF BUSINESS ADMINISTRATION

433 VARNER HALL
http://www.sba.oakland.edu

(248) 370-3282
Fax: (248) 370-4275

Dean: *John C. Gardner, Sr.*

Office of the Dean: *Floyd G. Willoughby, Associate Dean; Moira Fracassa, undergraduate academic adviser; Sheryl L. Klemanski, assistant to the dean and director, Office of Graduate Business Programs; Kathryn H. LeBlanc, MBA site administrator; Marti J. Riley, MBA adviser; Carole J. Terry, coordinator for academic advising*

Department chairs: *Thomas W. Lauer, Decision and Information Sciences; Augustin K. Fosu, Economics; Eileen Peacock, Accounting and Finance; Ravi Parameswaran, Management and Marketing*

Distinguished professor emeritus: *Karl D. Gregory*

Professor emeritus: *Sid Mittra*

Professors: *Lizabeth A. Barclay, Eleftherios N. Botsas, Daniel N. Braunstein, Gadis J. Dillon, David P. Doane, Edward J. Farragher, Augustin K. Fosu, John C. Gardner, Ronald M. Horwitz, Robbin R. Hough, Oded Izraeli, Robert T. Kleiman, J. Austin Murphy, Kevin J. Murphy, Ravi Parameswaran, Howard S. Schwartz, Miron Stano, Mohan R. Tanniru*

Associate professors: *Mohammed S. Bazaz, Joseph H. Callaghan, Addington Coppin, Eugene B. Fliedner, Sherman T. Folland, John W. Henke, John Kim, Thomas W. Lauer, Donald Mayer, Lee R. Mobley, Kevin Nathan, Mohinder Parkash, Eileen Peacock, Sandra H. Pelfrey, R. Mohan Pisharodi, Anandi P. Sahu, Barbara A. Theisen, John E. Tower, Ronald L. Tracy, Mary P. Van Sell, T. J. Wharton, Floyd G. Willoughby, Kenneth M. York*

Assistant professors: *Mukesh Bhargava, Kieran Mathieson, Nivedita Mukherji, Arline Savage, Srinarayan Sharma, Mark Simon*

Special instructor: *David D. Sidaway*

Adjunct professors: *Paul O. Kingstrom, Diane B. Stricker*

Lecturers: *Margaret Jean Cannon, Frank P. Cardimen, Jr., Richard Cassle, David W. Essig, Robert J. Forbes, Patricia Kish, Earl LaBoissoniere, Lynn Mroz, Ronald Semaan, Michael Sugameli*

Applied Technology in Business Program: *Mohan R. Tanniru, director; Jeffrey J. Kowalke, associate director*

Center for Family Business: *Patricia Kish, associate director*

Board of Visitors

The Board of Visitors provides a direct link between the business community and the School of Business Administration. The board is composed of outstanding 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:

Michael W. Grieves, President, Data Systems Network Corporation; Chairman, Board of Visitors
Joseph B. Anderson, Jr., Chair & CEO, Chivas Products Ltd.
Ralph A. Caponigro, Senior Vice President and Chief Financial Officer, Compuware

Mission

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

General Information

The School of Business Administration programs enable students to combine the intensive study of a functional area of business (i.e., accounting, finance, human resources management, management information systems or marketing) with a broad background in management. Alternatively, students can focus on economics, the fundamental discipline behind business processes.

In these programs, a strong foundation in liberal arts is combined with a rigorous education in written and oral communications and in problem definition, analysis and resolution. This combination produces graduates who can think analytically, communicate effectively and work cooperatively with others of similar or diverse backgrounds in both domestic and international environments. Graduates of these programs are prepared to handle the increasingly complex and changing problems faced by managers in profit oriented enterprises and not-for-profit organizations, both public and private.

The programs include:

1. Bachelor of Science with majors in accounting, economics, finance, general management, human resources management, management information systems and marketing.

2. Bachelor of Arts with a major in economics (offered in conjunction with the College of Arts and Sciences; see the Department of Economics section in the Arts and Sciences portion of the catalog for a description of this program).
3. Minors in accounting, accounting information systems, applied technology in business (ATIB), economics, finance, general business, human resources management, international management, management information systems, marketing, production and operations management, and quantitative methods.

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

The School of Business Administration offers the Master of Business Administration (MBA) degree for students in any major, including business and management. The MBA is a professional program in business designed to prepare students for careers involving problem identification, problem solving, decision making and leadership in any type of organization. MBA students may elect concentrations in accounting, business economics, finance, human resources management, international business, management information systems, marketing or production/operations management. It is preferred that students with an undergraduate degree in business or one of the functional areas of management have two years of work experience before entering the MBA program.

The School of Business Administration offers the Master of Accounting degree. Undergraduate students majoring in accounting should contact the Office of Graduate Business Programs (416 Varner Hall, 370-3287) for detailed information on admissibility into the program.

The Post Master Certificate program is offered to those who hold an MBA or similar degree and wish to earn a specialization beyond the master's degree. Certificates are available in accounting, business economics, finance, human resource management, international business, management information systems, marketing and production/operations management.

Oakland University undergraduates working on majors other than those in business administration may start the MBA program while completing their undergraduate degree. To be eligible, students should have a grade point average in the top 25 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*.

The School of Business Administration is accredited, on both the undergraduate and MBA levels, by the Accreditation Council of the American Assembly of Collegiate Schools of Business (AACSB). In addition, the accounting program has achieved AACSB accreditation.

For more information on the OU MBA, the Master of Accounting program, the Post Master Certificate Program, accreditation, the undergraduate programs, SBA courses and SBA faculty, visit the School's Web site at: http://www.sba.oakland.edu.

Degree Requirements

The curriculum described shall be followed by students entering the School of Business Administration beginning with the fall 1998 semester. Students enrolled prior to fall 1998 may choose to satisfy either the degree requirements listed in this catalog or those in the catalog of the academic year in which they were initially admitted to pre-business in the School of Business Administration (or any catalog during the interim), provided that catalog is not more than six years old at the time of graduation. Students who transfer to the School of 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 business administration programs consist of the following parts: general education, ethnic diversity, writing proficiency and the precore, the core, the major, and free electives (if needed to reach 128 credits). Students in these programs must satisfy the specific requirements of each of these parts and must earn a minimum of 128 credits. (See *Bachelor of Science with a major in economics* for the specific requirements of that degree program.)

Each student must:

1. Complete at least 128 credits, including any free electives needed to reach this total
2. Complete the writing proficiency requirement by passing RHT 160, Composition II, with a grade of 2.0 or better, or through one of the alternative methods discussed under *Undergraduate degree requirements*
3. Complete the university general education requirement as detailed in the general education section below and also under *Undergraduate degree requirements*
4. Complete the university ethnic diversity requirement as detailed in the ethnic diversity section below and under *Undergraduate degree requirements*
5. Complete the precore requirements as listed below and be admitted to major standing in business administration or economics as detailed in the *Admission to major standing* section below
6. Complete the core program and the requirements of one of the majors in the School of Business Administration
7. Complete at least 32 credits at the 300 level or above
8. Complete at least 32 credits at Oakland University, of which at least 31 credits must be in courses offered by the School of Business Administration, excluding ECN 150, 200, 201, 210 and QMM 250. Of these 31 credits, at least 8 credits must be in the student's major
9. Take the last 8 credits needed to complete baccalaureate requirements at Oakland University
10. Earn a cumulative grade point average of at least 2.00 in courses taken at Oakland University and in courses taken in the School of Business Administration.

Academic Advising, Mentoring and Major Standing

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

Students who have more specific questions about schedule planning, degree requirements, admission to the SBA, major standing, transfer credit, petitions of exception or graduation audits should meet with one of the school's professional advisers. The advising office is located in 433 Varner (370-3285). To avoid delays, students are encouraged to seek advising prior to early registration periods.

Once major standing has been achieved (see *Admission to major standing in business administration* or *Admission to major standing in economics*), students are encouraged to consult with faculty within their major area to discuss schedule planning within the major, career tracking and other issues relevant to making academic decisions that will enhance opportunities for success within a chosen career field.

Requirements for Business Administration Majors

General education requirement

Students in the School of Business Administration must satisfy the university general education requirement (see *Undergraduate degree requirements*). 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; and natural science and technology. For School of Business Administration students, the mathematics, logic and computer science general education category is satisfied by the school's precore mathematics requirements. In addition, for all SBA majors **except economics majors,** the social science general education requirement is satisfied by the school's precore economics requirement. School of Business Administration students are encouraged to increase their background in ethics by taking PHL 103, Introduction to Ethics, to satisfy the university's Western civilization general education requirement.

Ethnic diversity requirement

Students in the School of Business Administration must satisfy the university ethnic diversity requirement (see *Undergraduate degree requirements*). The SBA offers four courses that satisfy the ethnic diversity requirement: ECN 201, 338; MKT 404 and ORG 434.

Writing proficiency and precore requirements

As preparation for the various majors of the business administration program, students must earn a grade of 2.0 or better in each of the following courses in writing, speech communication, mathematics, computer use, economics, accounting and statistics.

The required precore courses are:

RHT 150-160	Composition I-II (or complete the writing proficiency requirement in another manner)	0-8
COM 201	Public Speaking	
or COM 202	Group Dynamics and Communication	4
MTH 011-012	Elementary-Intermediate Algebra (if required, based on math placement)	0
MTH 121	Linear Programming, Elementary Functions (or MTH 141)	4
MTH 122	Calculus for the Social Sciences (or MTH 154)	4
MIS 200	Personal Productivity with Information Technology	4
or CSE 125	Introduction to Computer Use	
ECN 200	Principles of Macroeconomics	
and ECN 201	Principles of Microeconomics	
or ECN 210	Principles of Economics (a 6-credit course that covers the material of both ECN 200 and 201)	6-8
ACC 200	Introductory Financial Accounting	4
ACC 210	Managerial and Cost Accounting I	4
QMM 250	Statistical Methods for Business	6
		36-46

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 writing proficiency requirement and steady progress in the mathematics sequence. Once sophomore status has been achieved (28 credits), students will begin work on the economics, accounting and statistics requirements.

Admission to major standing in business administration

To be eligible to take 300- and 400-level courses, students must be admitted to major standing in the School of Business Administration. Exceptions to this policy are ACC 310, ENG 382, FIN 322, MIS 300, MKT 302, ORG 330, POM 343 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 grade point average of 2.60 in all courses taken at Oakland University
4. A minimum grade of 2.0 in each of the following precore courses or their equivalents: ACC 200, 210; COM 201 or 202; ECN 200 and 201 (or 210); MIS 200 or CSE 125; MTH 121, 122; 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.

Core program

Each of the business major programs requires 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 Writing (or ENG 380 or 381)	4
ECN 303	Managerial Economics	3
MKT 302	Marketing	4
ORG 330	Introduction to Organizational Behavior	3
POM 343	Operations Management	4
FIN 322	Managerial Finance I	4
MIS 300	Management Information Systems	3
MGT 350	Legal Environment of Business	3
ORG 331	Introduction to the Management of Human Resources	3
MGT 435	Management Strategies and Policies	4
		35

All courses in the core program require major standing except ENG 382, all ECN courses, FIN 322, MIS 300, MKT 302, ORG 330 and POM 343. 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.

Major programs

Students continue their program by taking 15-24 additional credits specified in their major area. The junior and senior years will be devoted to the successful completion of the requirements of the core and major. Majors from which business administration students may choose are detailed below. Double majors are permitted in all areas except general management. No more than 4 credits of independent study (490 courses) may be used to meet the major elective requirement. Courses numbered 480 may be repeated for credit provided the topics are different.

Free electives

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

Requirements for the major in accounting

Major adviser: *Eileen Peacock*

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

To fulfill requirements for the accounting major, students must be admitted to major standing in accounting, complete the core program and earn a minimum of 32 credits in the courses specified below, with a grade of 2.0 or better in each major course. A grade of 2.0 or better must be achieved in each prerequisite accounting course before a student may enroll in subsequent accounting courses.

Required precore courses:		**Credits**
ACC 200	Introductory Financial Accounting	4
ACC 210	Managerial and Cost Accounting I	4
		8
Required major courses:		
ACC 310	Intermediate Financial Accounting I	3
ACC 311	Intermediate Financial Accounting II	3
ACC 320	Managerial and Cost Accounting II	3
ACC 411	Auditing	3
ACC 415	Federal Income Taxation	3
ACC 418	Computer-based Accounting Systems	3
		18
Electives — Choose 6 credits:		
ACC 401	Advanced Financial Accounting (3)	
ACC 412	Government and Not-for-profit Accounting (3)	
ACC 413	Regulatory Agencies and the Accounting Profession (3)	
ACC 419	Design of Computerized AIS (3)	
ACC 420	Advanced Auditing Topics (3)	
ACC 480	Contemporary Accounting Issues (3)	
		6
		32

Because of specific examination requirements, students who plan to take a professional accounting examination (CPA, CMA or CIA) should discuss their options with an accounting faculty member before enrolling in 400-level accounting courses. The options include taking a fifth year of undergraduate courses or completing the Master of Accounting degree program.

The Master of Accounting degree program provides for 33 credits of accounting and related course work. Undergraduate students will be able to apply to enter the program after completing ACC 310. With the completion of 158 credits of undergraduate and graduate course work students will graduate with a Bachelor of Science with a major in accounting and a Master of Accounting. This program is described in a supplement to the Oakland University graduate catalog and on the SBA Web page. *This program is an alternative to the fifth year option.*

Fifth year option: An alternative to the Master of Accounting is to take a fifth year of undergraduate accounting courses.

Although it is not required, the School of Business Administration suggests that students planning to take the Certified Public Accountant (CPA) examination consider taking an additional 30 credits of study in accounting, as recommended by the American Institute of Certified Public Accountants. During this fifth year, students should take the following 30 credits: 18 credits of 400-level accounting courses (in addition to the courses required for the

four-year accounting major), FIN 422, MGT 450 and an additional quantitative methods course.

Requirements for the major in finance

Major adviser: *Ronald M. Horwitz*

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 22-23 credits, as specified below, with a grade of 2.0 or better in each major course. A grade of 2.0 or better must be achieved in FIN 322 before a student may enroll in any subsequent finance course.

Required in the core:		**Credits**
FIN 322	Managerial Finance I	4
Required major courses:		
ACC 301	Financial Reporting and Analysis*	3
FIN 418	Financial Institutions and Capital Markets	3
FIN 416	Investment Analysis	3

*In lieu of ACC 301, students may substitute *both* ACC 310 and 311.

Electives — Choose three courses from the following (some may require additional prerequisites):**

FIN 417	Investment Portfolio Management (3)
FIN 419	International Financial Management (3)
FIN 420	Real Estate Investment, Financing and Taxation (3)
FIN 422	Managerial Finance II (3)
FIN 480	Seminar — Special Topics (3)
	9-10
	22-23

**ACC 320 (3) or ECN 321 (4) may be substituted for one finance elective. Students interested in a career in banking are encouraged to take ECN 321 as a major elective.

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 a minimum of 15 additional credits in electives with a grade of 2.0 or better in each major 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, POM or QMM) and must be chosen from courses numbered 300 or higher; at least two courses 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: *Kenneth M. York*

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 concepts and techniques needed to acquire, develop and utilize an organization's human resources. The program includes broad coverage of such topics as personnel psychology, 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 at least 26 credits as specified below, with a grade of 2.0 or better in each major course.

Required in the core:		**Credits**
ORG 330	Introduction to Organizational Behavior	3
ORG 331	Introduction to the Management of Human Resources	3
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, at least one of which must be a 400-level ORG course:		
ORG 431	Leadership and Group Performance (4)	
ORG 432	Motivation and Work Behavior (4)	
ORG 470	International Organizational Behavior and Human Resources Management (4)	
ORG 480	Topics in Organizational Management (4)	
MGT 480	Seminar: Current Business Topics (4)	
ECN 338	Economics of Human Resources (4)	
PS 454	Public Personnel Administration (4)	
		8
		26

Requirements for the major in management information systems

Major adviser: *Thomas W. Lauer*

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 at least 28 credits, as specified below, with a grade of 2.0 or better in each major course.

Required in the pre-core and core:		**Credits**
MIS 200	Personal Productivity with Information Technology	4
or CSE 125	Introduction to Computer Use	
MIS 300	Management Information Systems	3

Required major courses:		
CSE 130	Introduction to Computer Programming	4
or CSE 131	Computing I	
or CSE 220	Computer-based Information Systems I (COBOL)*	
MIS 304	Database Management	4
or CSE 345	Database Design and Implementation	
MIS 316	Systems Analysis	4

Electives — Choose three courses, at least one of which is MIS 405, 407, 416 or 426:

MIS 400	Analysis of Complex Systems (3)
MIS 405	Business Data/Telecommunications (3)
MIS 407	Projects and Problem Solving (3)
MIS 416	Advanced Systems Analysis and Design (3)
MIS 421	Advanced Business Applications (3)
MIS 426	GUI Application Development (3)
MIS 436	Decision Support Systems (3)
MIS 444	Simulation in Management (3)
MIS 480	Advanced Topics in MIS (2 or 3)
ACC 418	Computer-based Accounting Systems (3)
CSE 220	Computer-based Information Systems I (COBOL) (4)
CSE 221	Computer-based Information Systems II (COBOL) (4)

9-11
28-30

*If not used to satisfy an MIS major requirement, CSE 220 can be used as an MIS elective.

Requirements for the major in marketing

Major adviser: *John W. Henke*

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 a minimum of 24 credits, as specified below, with a grade of 2.0 or better in each major course.

Required in the core:		Credits
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 (4)
MKT 420	Distribution Channels Management (4)
MKT 430	Sales Management (4)
MKT 450	International Marketing (4)
MKT 470	Business to Business Marketing (4)
MKT 480	Seminar in Marketing (4)

8
24

Bachelor of Science with a Major in Economics

Major adviser: *Augustin K. Fosu*

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. Majoring in economics prepares students for the workplace of the future which will require workers who are flexible, adaptable to change, and who can propose practical solutions to solve problems quickly.

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

For economics majors, the Bachelor of Science degree offers a more quantitative and business-oriented approach to economics than does the Bachelor of Arts degree, offered through the College of Arts and Sciences (see the Department of Economics section in the College of Arts and Sciences portion of the catalog). The department encourages students who are considering attending graduate school in economics to take MTH 141 and 154 instead of MTH 121 and 122. Entrance into a master's program in economics will also require a student to take MTH 155; and into a doctoral program, MTH 254.

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 a minimum of 128 credits as follows:

English composition:		Credits
RHT 150-160	Composition I-II (or complete the writing proficiency requirement in another manner)	0-8
ENG 382	Business Writing (or ENG 380 or 381)	4

General education requirement: 28

See *Undergraduate degree requirements*. The math, logic and computer science field category will be satisfied by cognate courses. For economics majors, the social science field category cannot be satisfied with an economics course.

Ethnic diversity requirement:

See *undergraduate degree requirements*.

Cognate courses:		
MTH 011-012	Elementary-Intermediate Algebra (if necessary)	0
MTH 121	Linear Programming, Elementary Functions (or MTH 141)	4
MTH 122	Calculus for the Social Sciences (or MTH 154)	4
MIS 200	Personal Productivity with Information Technology	
or CSE 125	Introduction to Computer Use (or CSE 130 or 131)	4
ACC 200	Introductory Financial Accounting	4
QMM 250	Statistical Methods for Business	6
FIN 322	Managerial Finance I	4

Quantitative methods course — choose one:		4
ECN 405	Econometrics	
QMM 452	Forecasting	

Required courses:	
ECN 200	Principles of Macroeconomics
and ECN 201	Principles of Microeconomics

or ECN 210	Principles of Economics (a 6-credit course that covers the material of both ECN 200 and 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. FIN 421 also qualifies as an elective. It is strongly recommended that students become familiar with international institutions within economics. Three courses are well suited to accomplish this: ECN 326, 342 or 373. No more than 4 credits in ECN 490 may be counted as economics electives. 16

General electives: 26-36

128

Transfer students must complete at least 32 credits at Oakland University, of which at least 16 credits must be offered by the School of Business Administration. Of these 16 credits, at least 8 must be in the student's major.

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. A minimum grade point average of 2.60 in all courses taken at Oakland University
4. Completion of the following courses, or their equivalents, with a grade of 2.0 or better in each course: MTH 121, 122; MIS 200 or CSE 125 (or 130 or 131); ECN 200 and 201 (or 210) and QMM 250
5. Submission of an "Application for Major Standing."

Although ECN 301 and 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 twelve 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 any of these minors, with the exception of the minor in applied technology in business, students must complete the prescribed courses with a grade of 2.0 or better in each course. (See the description of the minor in applied technology in business for the grade requirements for that minor.) Students majoring in programs other than business administration may take SBA courses only if they meet the prerequisites (except major standing).

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 of Arts and Sciences, whether they have applied for a minor or not, are limited to no more than 25 percent of their total degree credits in business courses. The maximum of 25 percent of total degree credits includes courses taken at Oakland University and all previous colleges. Economics (ECN) courses, QMM 250 and 452 are excluded from this requirement. Therefore, students from majors outside the business administration program may not earn more than 25 percent of total degree credits in transfer plus Oakland credits in ACC, FIN, MGT, MIS, MKT, ORG, POM or QMM courses (excluding those noted above).

Any student enrolled in any major in the School of Business Administration may receive

any minor offered by the school, other than in the student's major, except for the minors in general business and applied technology in business. The minor in general business is open only to economics majors (B.A. or B.S. program) and students with majors outside the SBA. The minor in applied technology in business is available only to students majoring in business who have been admitted into the ATIB program. Students not in a major within the School of Business Administration are similarly eligible for multiple minors, but are subject to the 25 percent of total degree credits maximum discussed above. **Transfer students planning to earn a minor must earn at least 9 credits toward the minor at Oakland University; at least 6 of these 9 credits must be in courses at the 300 level or above.**

Minor in accounting

Coordinator: *Eileen Peacock*

The minor in accounting consists of a minimum of the following 20 credits and any prerequisites for these courses: ACC 200, 210 and 12 additional credits in accounting (ACC) courses. This minor is open to all students except accounting majors.

Minor in accounting information systems

Coordinator: *Joseph W. Callaghan*

The minor in accounting information systems consists of a minimum of 21 credits and any prerequisites for these courses: ACC 200 and 210; ACC 320 or 310; ACC 418 or MIS 316; ACC 419 and MIS 304. This minor is open to all students except accounting majors.

Minor in applied technology in business (ATIB)

Coordinator: *Mohan R. Tanniru*

The minor in applied technology in business is a unique business minor. It provides students admitted into the program with a 32 credit hour tuition scholarship in their junior and senior years so that they can focus their learning on the proactive use of information technology (IT) in solving corporate sponsored business problems. Application to the program is restricted to business majors and admission to the program is competitive; students interested in applying for this minor should contact the program coordinator. The minor consists of a minimum of 19 credits and any prerequisites for these courses: MIS 200 (or CSE 125), MIS 300, ATB 306, 307, 406 and 407. A minimum grade of 2.0 is required in each of these courses, and an average grade of 3.00 or better in the six courses.

Minor in economics

Coordinator: *Augustin K. Fosu*

The minor in economics consists of a minimum of 18 semester credits in economics courses. A student must take ECN 150 or 210 or both ECN 200 and 201 and any prerequisites for these courses. In addition, a student must earn at least 12 additional credits (16 credits if ECN 150 was taken) in economics (ECN) courses in order to fulfill the 18 credit requirement. This minor is open to all students except economics majors.

Minor in finance

Coordinator: *Ronald M. Horwitz*

The minor in finance consists of a minimum 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 open to all students except finance majors.

Minor in general business

Coordinator: *Kevin Nathan*

The minor in general business consists of a minimum of 19-23 credits, described as follows, and any prerequisites for these courses: ECN 210 or both ECN 200 (or 150) and 201, ACC 200, ORG 330 and 6-8 additional credits in 300- and 400-level electives (ACC, FIN, MGT, MIS, MKT, ORG, POM or QMM courses) offered by the School of Business Administration. Economics (ECN) 300- and 400-level courses are not acceptable electives for this minor. This minor is open to all majors including the B.A. and B.S. in economics, but students majoring in other programs offered by the School of Business Administration are not eligible.

Minor in human resources management

Coordinator: *Kenneth M. York*

The minor in human resources management consists of a minimum of 18 credits, described as follows: ORG 330, 331 and 434 and 8 additional credits chosen from MGT 433; ORG 430, 431, 432, 470 and 480. This minor is open to all students except SBA human resources management majors.

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: ECN 210 or both ECN 200 and 201, 373; MGT 423 and one course chosen from ACC 517, ECN 326, 342, 350; FIN 419; MKT 450 and ORG 470. Proficiency in a foreign language is not required but is highly recommended. This minor is open to all majors.

Minor in management information systems

Coordinator: *Srinarayan Sharma*

The minor in management information systems consists of a minimum of 18 credits in the following courses and any prerequisites for these courses: CSE 125 or MIS 200, CSE 130 or 131 or 220 or ACC 418; MIS 300, 304 and 316. This minor is open to all students except MIS majors.

Minor in marketing

Coordinator: *John Kim*

The minor in marketing consists of a minimum of 20 credits, described as follows, and any prerequisites for these courses: MKT 302, 353, 404 and any two courses chosen from MKT 405, 406, 420, 430, 450, 470 and 480. This minor is open to all students except marketing majors.

Minor in production and operations management

Coordinator: *T. J. Wharton*

The minor in production and operations management consists of a minimum of 20 credits, described as follows, and any prerequisites for these courses: MIS 200 or CSE 125 or 130 or131; QMM 250 or STA 226; POM 343 and any two courses chosen from POM 441, 445, 448, 480 and QMM 452. This minor is open to all majors.

Minor in quantitative methods

Coordinator: *David P. Doane*

The minor in quantitative methods consists of a minimum of 19 credits, described as follows, and any prerequisites for these courses: CSE 130 or 131; QMM 250 or STA 226, and any three courses chosen from QMM 452, 440; POM 448; MIS 444; ECN 405; STA 323, 324. This minor is open to all majors.

Policies and Procedures

High school admissions

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

Transfer policy

Transfer students must have a 2.80 cumulative grade point average and mathematics through algebra for admission to pre-business.

Evaluation of transfer courses is a two-part process. General education and composition courses are evaluated by the Academic Records Office. Business courses, including the required computer science courses, are evaluated by the School of Business Administration. Credit for specific SBA courses is authorized for courses of similar content taken at other colleges and universities accredited by a regional accrediting agency. Students transferring from other institutions, especially those from outside the United States, may be required to submit course descriptions and related materials to aid in these transfer evaluations. See *Transfer student information* for additional information.

Internal transfer

Oakland University students seeking admission to the School of Business Administration from other programs will be considered for admission after they have completed MTH 121 (or an equivalent) with a grade of 2.0 or better. An overall GPA of 2.60 or better in at least 12 credits at Oakland University is also required.

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 in the School of Business Administration who must repeat a course in which a 2.0 is required must repeat that course at Oakland University or, with prior approval, at any regionally accredited two- or four-year institution. See *Repeating courses* for more information.

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.

Assessment

To assist in the continuous improvement of its programs, the SBA engages in a range of assessment efforts. Students are expected to actively participate in these assessment and improvement efforts. Assessment activities include the following:

Student portfolios: Students are expected to maintain a portfolio of activities that includes

grades in given courses, writing samples from various courses and descriptions of leadership, team, international and work experiences. Student portfolios are made available to recruiters at graduation.

Standard tests: Students are expected to take a standard business or economics test in the capstone course of the program. Not graded individually, these tests are used to assess the average performance of students in the program.

Student/alumni satisfaction surveys: Periodically, current students and alumni are surveyed to provide feedback to the school's faculty, staff and students on the performance of the SBA's programs.

Additional Information

Cooperative education

Students in the School of Business Administration who want to combine relevant work experience with their college education 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 in business, not-for-profit or governmental organizations similar to those held by recent Oakland University graduates. On occasion, unpaid internships that provide work experience also are available. Students interested in the co-op program should contact the Cooperative Education Coordinator in the Department of Placement and Career Services (275 Vandenberg Hall, 370-3253).

Honors, awards and scholarships

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:

School honors are awarded by the School of Business Administration to students who have completed a minimum of 32 credits in SBA courses with a minimum GPA of 3.33 in courses offered in the school.

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

Beta Gamma Sigma: Beta Gamma Sigma is the national honor society for business schools accredited by the American Assembly of Collegiate Schools of Business (AACSB). Membership in Beta Gamma Sigma is one of the highest scholastic honors that a student in business administration can achieve. It is based on outstanding scholastic achievement as measured by overall grade point average. Invitation for membership to Beta Gamma Sigma is extended to graduating seniors in the top 10 percent of their class and juniors in the top 5 percent of their class.

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

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

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 of Business Administration awards/scholarships

Accounting Excellence Scholarship: This $3,000 scholarship is awarded annually and honors students who achieve excellence as accounting majors. Applicants must have a 3.30 or better GPA and be involved in extracurricular or community activities.

Alumni Scholarship: Two $750 awards are given annually to full-time students with junior or senior standing. Applicants must have an overall GPA of at least 3.00 (with 3.40 in their first 59 credits) and a 3.30 minimum GPA in School of Business Administration courses.

Applied Technology in Business Scholarships (ATIB): These two-year full scholarships (tuition for up to 64 credit hours plus fees for four terms) were established to support students who have been accepted into the Applied Technology in Business Program. This support allows students to focus their learning on the proactive use of information technology (IT) in solving corporate sponsored business problems. The program is competitive and the number of scholarships available is dependent on the number of organizations that contribute to the ATIB Program. Minimum criteria for application to the program include: junior standing, a minimum GPA of 3.00 and at least a 3.0 in MIS 200 (or CSE 125).

Comerica Bank Diversity Scholarships: These $3,000 tuition scholarships were established to support disadvantaged students. Applicants should have junior standing, a GPA of 2.50 or above, and show financial need and disadvantaged status. Community involvement and leadership capabilities will be considered. Four scholarships will be awarded annually, two at the junior level and two at the senior level. Minorities are encouraged to apply.

Comerica Bank Outstanding Student Leadership Award: The purpose of this award is to recognize good students who commit their time, effort and energies to various on-campus and community programs, projects and activities. A monetary award accompanies this recognition.

Diane and Micheal Grieves Endowed Diversity Scholarship: This scholarship was established in recognition of the importance of a diverse workforce in the field of management information systems, and in recognition of the central role played by the School of Business Administration in educating highly skilled MIS graduates. This one-year $3,000 scholarship for tuition and fees will be awarded to a minority student pursuing a degree in management information systems.

Dicron Tafralian Memorial Scholarship: This scholarship is awarded annually, on a merit basis, to a continuing accounting major at Oakland University. Selection is made by the accounting faculty of the School of Business Administration. This scholarship was established in memory of Dicron Tafralian, who served in administrative capacities at Oakland University for many years.

Fidelity Bank Scholarship: This scholarship was established to assist financially disadvantaged minorities pursuing careers in all fields of business administration. A preference will be given to those with an interest in a career in banking. Candidates must be full time students, have achieved junior standing and have a GPA of 2.80 or above. This is a one year $2,500 scholarship for tuition and books.

Lorenz Scholars: These awards are to recognize academic excellence in SBA juniors who are moving into their senior year; $500 awards will go to the two students with the highest GPA.

Oakland Executive Association Scholarship: This scholarship was established to assist an Oakland County scholar. Candidates must be both scholarly and civic minded, be full time students, have achieved junior standing, have a GPA of 3.00 or above, be current residents of Oakland County and show university/civic involvement. This is a one year, $2,500 scholarship for tuition and books.

Paul F. Lorenz/Texas Instruments Excellence Awards: These awards are based on under graduate academic excellence. A tuition scholarship for the senior year will be awarded to the junior student who has the highest overall GPA in the School of Business Administration. In addition, awards of $1,000 and $500 will be made to two graduating seniors with the highest overall GPA.

Paul F. Lorenz Business Report Award: The purpose of this annual award is to encourage excellence in the preparation of business reports in School of Business Administration classes through the upgrading of business report writing skills. Each year two $500 awards go to undergraduate students and two $500 awards go to graduate students who have demonstrated superior business report writing skills.

Course Offerings

Following are descriptions of the courses offered by the School of Business Administration. Required precore and core courses for students majoring in the business 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, ENG 382, FIN 322, MIS 300, MKT 302, ORG 330, POM 343 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). 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) are limited to no more than 25 percent of their total degree credits in business courses. This 25 percent maximum includes credits earned at Oakland University and all other colleges but excludes economics (ECN) courses, QMM 250 and 452.

The school offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

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 status. MIS 200 or CSE 125 recommended.

ACC 210 Managerial and Cost Accounting I (3)
Analysis of accounting methods providing data for optimal managerial decisions, implementation and control. Topics include cost allocation; cost, volume and price relationships; product cost accounting and control systems; operations and capital budgeting, and related behavioral, reporting and information processing aspects.
Prerequisite: ACC 200. MIS 200 or CSE 125 recommended.

ACC 301 Financial Reporting and Analysis (3)
A study of financial accounting and reporting from the perspective of the user of accounting information. The course will emphasize the interpretation and analysis of specific accounting treatments rather than accounting methodology. *Accounting majors may not substitute this course for any required or elective accounting course.*
Prerequisite: ACC 200, major standing and junior status.

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, 210 and junior status. MIS 200 or CSE 125 recommended.

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 320 Managerial and Cost Accounting II (3)
An analysis of available procedures and techniques to sharpen accounting analyses for managerial planning and control. Extends subjects introduced in ACC 210 to nonmanufacturing firms, decentralized firms, transfer pricing and segment performance measurement.
Prerequisite: ACC 210, major standing and junior status.

ACC 401 Advanced Financial Accounting (3)
Topics include accounting and reporting for business combinations, partnerships, consolidated entities, interim financial statements and segments of business enterprises.
Prerequisite: ACC 311 and major standing.

ACC 411 Auditing (3)
Introduction to the objectives, techniques, and standards of internal and external audits of the accounts of an enterprise. Generally accepted auditing standards will be critically examined.
Prerequisite: QMM 250, ACC 311 or 301, and major standing.

ACC 412 Government and Not-for-Profit Accounting (3)
The characteristics of not-for-profit entities are analyzed and used to define the basic concepts of accounting for funds. Accounting and reporting principles applicable to governmental units, hospitals, schools and other nonprofit entities are discussed.
Prerequisite: ACC 310 or 301, and major standing.

ACC 413 Regulatory Agencies and the Accounting Profession (3)
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 310 or 301, and major standing.

ACC 415 Federal Income Taxation (3)
To acquaint students with the concepts of federal taxation. The essential logic underlying the federal tax laws will be explored, with emphasis placed on the tax treatment of individual taxpayers. The course focuses on tax theory and law rather than on the preparation of tax returns.
Prerequisite: ACC 310 or 301, and major standing.

ACC 418 Computer-based Accounting Systems (3)
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 419 Design of Computerized AIS (3)
Design of computer accounting information systems using the information engineering (IE) framework and computer-aided systems engineering (CASE) tools. Topics include a review of systems analysis in an accounting context, the design of windows-based accounting information systems, and the construction of traditional accounting cycles.
Prerequisite: ACC 418 or MIS 316.

ACC 420 Advanced Auditing Topics (3)
Examination of advanced topics in auditing. Emphasizes philosophy, standards, concepts and problem areas.
Prerequisite: ACC 411 and major standing.

ACC 480 Contemporary Accounting Issues (3)
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 for a total of 6 credits.
Prerequisite: ACC 311 or 301, and major standing.

ACC 490 Independent Study (2, 3)
Qualified and highly motivated students may engage in individual research, directed readings or group study under the supervision of a faculty member. Offered every term.
Prerequisite: An overall grade point average of 3.00 or better, major standing and an approved contract prior to registration.

APPLIED TECHNOLOGY IN BUSINESS

ATB 306 Business and Information Technology Foundations (3)
Role of information technology in solving business problems, with a special focus on process analysis/redesign, enterprise-wide data modeling and group decision making. Students work as teams to solve business problems using a variety of data base/spreadsheet tools and communicate their decisions (oral and written) to corporate sponsors periodically.
Prerequisite: Junior standing and acceptance into the ATIB program.

ATB 307 IT Project Management (3)
Students are assigned corporate sponsored projects so they can practice their problem solving and project management skills, with special focus on interviewing, task identification, time/resource estimation, setting milestones, and project presentation. Topics covered also include executive and knowledge based systems and inter-organizational systems.
Prerequisite: ATB 307.

ATB 406 Information Management (3)
Students continue to work on corporate student projects and practice additional skills such as meeting management, implementation and user training. Additional focus is innovative uses of IT, effective use of communications and networking, and management of diverse information needs as part of an organization's strategy.
Prerequisite: ATB 307.

ATB 407 Corporate Internship (3)
Students work at a corporate site and work on a specific project that has been agreed to by the program director and the corporation. The students manage the project on their own using a variety of skills they have acquired during the prior three semesters in this program.
Prerequisite: ATB 406.

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. Not open to students who have completed ECN 200 or MTH 141 or above. *Satisfies the university general education requirement in social science.* (Generally offered fall and winter semesters.)
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.* (Generally offered every term.)
Prerequisite: High school algebra and sophomore status.

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. Also explores economic perspectives on issues of ethnicity and gender in the U.S. economy. (Generally offered every term.) *Satisfies the university ethnic diversity requirement.*
Prerequisite: ECN 200 or 150, and sophomore status.

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.* (Generally offered fall semester.)
Prerequisite: High school algebra, sophomore status 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. (Generally offered fall semester.)
Prerequisite: ECN 201 or 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. (Generally offered winter semester.)
Prerequisite: ECN 201 or 210, and MTH 122, or permission of instructor.

ECN 303 Managerial Economics (3)
The study of microeconomic theory and its application to managerial decision making. Examines consumer behavior, cost and output estimation, optimization, pricing issues in competitive and non-competitive markets, decision making under uncertainty and capital budgeting. *This course is not open to economics majors*. Generally offered every semester.
Prerequisites: ECN 201 or 210, and MTH 122, or permission of instructor.

ECN 309 State and Local Public Finance (4)
The course provides explanation and analysis of state and local public finance practices and problems. Topics include public goods and externalities, benefit-cost analysis, organization of sub-national governments, the budget process, and state and local revenues and expenditures.
Prerequisite: ECN 150 or 201 or 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 201 or 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. Generally offered fall and winter semesters.
Prerequisite: ECN 150 or 201 or 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 201 or 210.

ECN 333 History of Economic Thought (4)
Surveys the history and development of economic theory. Examines the development of classical theory, the Marxian challenge, the neo-classical refinement (marginal revolution) and the Keynesian revolution. Emphasis will be placed on the development of economics as intellectual history.
Prerequisite: ECN 150 or 200.

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.
Satisfies the university ethnic diversity requirement.
Prerequisite: ECN 150 or 201 or 210.

ECN 342 Economic Analysis of Selected Nations (4)
Economic analysis of selected nation(s), emphasizing historical, political, and international determinants of trade, production, employment, migration, growth, inflation and economic policies. Selected countries will be announced in prior semester.
Prerequisite: ECN 150 or 201 or 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 210 or permission of instructor.

ECN 367 Economics of Health Care (4)
Application of tools of economic analysis to the health care industry and government health care policy. Examines the impact of the special characteristics of health care and the medical services industry on the pattern of health care produced, its distribution and resource allocation within the industry.
Prerequisite: ECN 201 or 210 or permission of instructor.

ECN 373 International Economics (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 210 or permission of instructor.

ECN 378 Economic Analysis 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 210 or permission of instructor.

ECN 380 Topics in Economics (4)
Study of a selected topic in economics. Emphasis is placed on the institutional rather than theoretical aspects of the topic. May be repeated for a total of 8 credits as long as the topic covered is different.
Prerequisite: ECN 201 or 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 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. (Generally offered every fall semester.)
Prerequisite: QMM 250 or STA 226 and ECN 301 or 303, or permission of instructor.

ECN 409 Urban Economics and Location Theory (4)
Application of microeconomic theory and empirical analysis to: residential choice and location of economic activities; migration patterns within and across states and metropolitan areas; major urban problems such as quality of life, transportation and optimum city size; and Michigan's economy.
Prerequisite: QMM 250 and ECN 301 or 303, or permission of instructor.

ECN 411 Advanced Methods in Economics (4)
Survey of advanced methods used in economics. Provides a comprehensive overview of techniques that are used by professional economists.
Prerequisite: ECN 301 or 303 or permission of instructor.

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 or 303 and QMM 250, or permission of instructor.

ECN 421 Monetary Theory and Policy (4)
A systematic treatment of monetary economics. Particular attention is paid to issues such as money demand, money supply, effects of money on the real economy (output and employment) and inflation, and effectiveness of monetary policy.
Prerequisites: ECN 302 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 303, 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 303, 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, impact 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 303, or permission of instructor.

ECN 480 Special Topics in Economics (4)
Intensive study of a selected topic in economics. Topics vary. See *Schedule of Classes* for current offering. May be repeated for a total of 8 credits as long as the topic covered is different.
Prerequisite: ECN 301 or 303.

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. May be repeated for a total of 8 credits.
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, working capital management and international financial management.
Prerequisite: ECN 201, ACC 200, QMM 250 and junior status.

FIN 416 Investment Analysis (3)
Provides a general framework for constructing portfolios and valuing investments. Important concepts include portfolio theory, credit analysis, valuation of call and conversions features on debt instruments, and fundamental analysis of equities and foreign assets.
Prerequisite: FIN 322, ACC 301 and major standing.

FIN 417 Investment Portfolio Management (3)
Analyzes trading in different types of spot and foreign assets, futures, options, and investment companies. Tax, transaction cost, and regulatory issues are evaluated, as are asset allocation and timing strategies, technical analysis, hedging, arbitrage, and portfolio management within the context of a financial plan.
Prerequisite: FIN 416.

FIN 418 Financial Institutions and Capital Markets (3)
Focus is on the structure and operations of financial intermediaries, analysis of innovative financial instruments, and credit and interest rate risk management.
Prerequisite: FIN 322 and major standing.

FIN 419 International Financial Management (3)
The application of the tools of financial analysis to cases and the problems of firms that have operations in several countries.
Prerequisite: FIN 322 and major standing.

FIN 420 Real Estate Investment, Financing and Taxation (3)
A look at acquisition, financing and sale of income-producing real estate. Topics to be covered include feasibility, appraisal, investment, financing and taxation.
Prerequisite: FIN 322 and major standing.

FIN 422 Managerial Finance II (3)
The application of the tools of financial analysis to specific cases in the financial management of corporate businesses and nonprofit enterprises.
Prerequisite: FIN 322 and major standing.

FIN 480 Seminar — Special Topics (3)
Intensive study of a selected finance topic. The topic will vary from term to term. May be repeated for a total of 8 credits.
Prerequisite: FIN 322, 421; ACC 301 and major standing.

FIN 490 Independent Study (2, 3)
Qualified and highly motivated students may engage in individual research, directed readings or group study under the supervision of a faculty member. Offered every term. May be repeated for a total of 8 credits.
Prerequisite: An overall grade point average of 3.00 or better, major standing and an approved contract prior to registration.

MANAGEMENT

MGT 350 Legal Environment of Business (3)
The legal framework of business decisions. Introduction to the legal system and a survey of government regulation of business. Legal, ethical and political issues in employment, consumer protection, antitrust and business associations.
Prerequisite: ECN 201 or 210, major standing and junior status.

MGT 423 International Business (4)
Analysis of the scope, structure and environment — social, cultural, political, legal, economic and technological— of international business in this globalized era. Emphasis will be on management strategies of planning, entry and location, marketing, accounting and taxation, finance, human resources, information systems and manufacturing across national/cultural boundaries.
Prerequisite: Major standing.

MGT 433 Labor/Management Relations (4)
Analysis of management/employee relations in the private and public sector. Topics include factors influencing the supply and demand for labor, evolution and governance of unions, collective bargaining and public policy.
Prerequisite: ECN 201 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 business core program and senior status. For SBA majors only.

MGT 450 Business Law (4)
Survey of topics in private commercial law under the Uniform Commercial Code. Contracts, agency, property and insurance, secured transactions and commercial paper. Legal responsibilities of the licensed professions.
Prerequisite: MGT 350 and major standing.

MGT 480 Seminar: Current Business Topics (4)
The analysis of topics of current interest in management. Outside faculty and managers may participate in the seminar as an integral part of the course. May be repeated for a total of 8 credits.
Prerequisite: ORG 331 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. May be repeated for a total of 8 credits.
Prerequisite: An overall grade point average of 3.00 or better, major standing and an approved contract prior to registration.

MANAGEMENT INFORMATION SYSTEMS

MIS 200 Personal Productivity with Information Technology (4)
Introduction to concepts, principles, and methods that knowledge workers use to organize and manage individual information resources, including the following information technology: the Internet, word processors, spreadsheets, graphics and database management systems. Hands on exercises will be a major part of the course. Recommended for students intending to major in MIS.

MIS 300 Management Information Systems (3)
Examination of information 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, database management, decision support systems, office automation and telecommunications across functional areas. Includes lab exercises.
Prerequisite: CSE 125 or MIS 200 and junior status.

MIS 304 Database Management (4)
Technology, organization, design, use and administration of database management systems (DBMS). Includes exercises using microcomputer and mainframe DBMS packages.
Prerequisite: A high-level programming language, MIS 300 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 database management systems, monitoring and control, review and maintenance, and project management. Includes class projects using a CASE tool.
Prerequisite: A high-level programming language, MIS 300 and major standing.

MIS 400 Analysis of Complex Systems (3)
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 303, MIS 316 and major standing.

MIS 405 Business Data/Telecommunications (3)
Technology, design, management, and use of data, voice, image, and video communication networks. Topics include teleprocessing, micro-mainframe links, local area networks, wide area networks, telephone systems, electronic mail, transborder data flows and communication protocols. Includes exercises using various network configurations.
Prerequisite: MIS 300 and major standing.

MIS 407 Projects and Problem Solving (3)
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, CSE 130 or 131 or 220 and major standing.

MIS 416 Advanced Systems Analysis and Design (3)
Students will develop a working system from a business case using an integrated CASE tool to produce data and process models, develop a design, generate code and test running code for the system. This course will build on the CASE tool skills in MIS 316 and provide project experience for students.
Prerequisite: MIS 304 and 316.

MIS 421 Advanced Business Applications (3)
Sophisticated business information systems will be analyzed, designed and programmed using advanced 3GL capabilities such as COBOL's report writer, relative, direct, and indexed files, and comparisons with 4GLs. Applications in accounting, finance, marketing, human resources and production will be emphasized.
Prerequisite: CSE 130, 131 or 220 and major standing.

MIS 426 GUI Application Development (3)
Sophisticated graphical user interface (GUI) applications will be developed using Visual Basic, Powerbuilder or some other appropriate development tool. Course topics include the psychology of user interface design, developing client/server systems, GUI standards, event-driven programming models, single and multi-user interfaces and interacting with databases.
Prerequisites: MIS 304 and MIS 316.

MIS 436 Decision Support Systems (3)
Examines the design and implementation of decision support systems. Considers the roles of expert systems and artificial intelligence in decision making. Includes a critical review of theory and case studies taken from recent MIS literature.
Prerequisite: MIS 300 and major standing.

MIS 444 Simulation in Management (3)
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 or 131, MIS 300, knowledge of BASIC or FORTRAN and major standing.

MIS 480 Advanced Topics in MIS (2 or 3)
An advanced course involving study of current research issues and recent developments in MIS. Topics vary. See *Schedule of Classes* for current offerings. May be repeated for a total of 6 credits.
Prerequisite: MIS 300, 304 or 316, and major standing.

MIS 490 Independent Study (3)
Qualified and highly motivated students may engage in individual research, directed readings or group study under the supervision of a faculty member. Offered every term. May be repeated for a total of 8 credits.
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 150 or 200, and junior status.

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. This course requires a knowledge of spreadsheets and financial statements.
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. *Satisfies the university ethnic diversity requirement.*
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 (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 and major standing.

MKT 470 Business to Business Marketing (4)
Study of the area of marketing that addresses the needs of the organizational customer in industry, government and institutions. The special challenges of business to business operations, such as assessing marketing opportunities, the organizational buying process, and formulating and evaluating marketing strategy and performance are discussed.
Prerequisite: MKT 302 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 retail management, new product development, services marketing or any area not covered by a specific course. May be repeated for a total of 8 credits.
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. May be repeated for a total of 8 credits.
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 (3)
Examination of the theoretical and empirical issues that affect the management of individual, group and organizational processes including structure, motivation and leadership.
Prerequisite: Junior status.

ORG 331 Introduction to the Management of Human Resources (3)
Examination of applied issues relevant to the management of human resources including recruitment, selection, performance appraisal, introduction to applied research, international human resources management and organizational development. Projects applying course concepts are required.
Prerequisite: ORG 330 and major 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. Computer-based exercises will be required.
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 Advanced Human Resources Management (4)
Discussion of advanced topics in human resources. Topics include compensation, employee involvement, information systems, development, assessment and selection. A project is required. *Satisfies the university ethnic diversity requirement.*
Prerequisite: ORG 331 and major standing.

ORG 470 International Organizational Behavior and Human Resources Management (4)
Examines both international organizational behavior and human resource management in order to prepare for work in a global environment. Cross-cultural training, managing global managers, compensation, labor relations and repatriation are among the topics covered. Offered every other year.
Prerequisite: ORG 331 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 a total of 8 credits.
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. May be repeated for a total of 8 credits.
Prerequisite: An overall grade point average of 3.00 or better, major standing and an approved contract prior to registration.

PRODUCTION AND OPERATIONS MANAGEMENT

POM 343 Operations Management (4)
Study of operations of manufacturing and service organizations. Introduction to operational design and control issues such as forecasting, capacity planning, facility location and layout, production control, material requirements planning, scheduling and quality assurance. Includes international, legal and ethical aspects, as well as computer exercises.
Prerequisite: QMM 250 or STA 226 and junior status.

POM 441 Manufacturing Planning and Control (4)
Definitions, techniques and practices in manufacturing applications, including traditional manufacturing techniques as well as current issues such as cellular and flexible manufacturing systems. Emphasizes differences between American and foreign manufacturing techniques.
Prerequisite: POM 343 and major standing.

POM 445 Cases in Operations Management (4)
Analysis of diverse cases from the perspective of the operations function in service and manufacturing organizations. Cases are descriptive of actual operating situations. Covers situations that lend themselves to analytical and computer techniques as well as problems involving subjective judgment and creativity in translating theory into practice.
Prerequisite: POM 343 and major standing.

POM 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.
Prerequisite: POM 343 and major standing.

POM 480 Special Topics in Operations Management (4)
Intensive study of a selected topic in production/operations management. Topics vary. See *Schedule of Classes* for current offering. May be repeated for a total of 8 credits as long as the topic covered is different.
Prerequisite: POM 343 and major standing.

POM 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. May be repeated for a total of 8 credits.
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 for Business (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.
Prerequisite: MTH 122 or 154, and CSE 125 or 130 or MIS 200.

QMM 440 Management Science (4)
Overview of quantitative methods used in managerial decision making. Includes decision analysis, linear, integer, and dynamic programming, networks, PERT/CPM, simulation, waiting-line models and Markov chains. Emphasizes the use of computer software in formulation and analysis of management science models.
Prerequisite: QMM 250 or STA 226, ECN 303 and major standing.

QMM 452 Forecasting (4)
Survey of common forecasting methods and their applications in business. Includes case studies and discussion of behavioral issues affecting the use of forecasting information within the organization. Computer tools are used to prepare and present written and oral forecasts based on real data.
Prerequisite: QMM 250 or STA 226 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. May be repeated for a total of 8 credits.
Prerequisite: An overall grade point average of 3.00 or better, major standing and an approved contract prior to registration.

SCHOOL OF EDUCATION AND HUMAN SERVICES

544 O'DOWD HALL
(248) 370-3050
Fax: (248) 370-4202

Dean: *Mary L. Otto*

Associate Dean: *F. James Clatworthy*

Office of the Dean: *Cynthia R. Hendrix, adviser; Judith M. Hoppin, associate director, Continuum Center; Vicky Hunt, assistant to the dean; Sherrill M. Karppinen, coordinator, field placements; Angelete Melhado, PSA/Urban Partnerships; David C. Moroz, adviser; Jill Walters, adviser; Jean E. Williams, coordinator, counseling practicum laboratory*

Ken Morris Center for the Study of Labor and Work: *Michael P. Long, program director*

Lowry Center for Early Childhood Education: *Shannan McNair, director; Claire A. Rewold, program coordinator*

Institute for Action Research and Professional Development: *Donald M. Miller, director*

Programs Offered

The School of Education and Human 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, a five-year secondary education program leading to teaching certification for selected majors, and a Bachelor of Science in human resource development with specialization in either human services or training and development. Minors in human resource development and in labor and employment studies are also available. Students considering a major in elementary education should consult the *Admissions* section of this catalog for specific preparation requirements.

The School of Education and Human Services also offers programs leading to the Doctor of Philosophy in reading, the Education Specialist in school administration, the Master of Arts in counseling, and the Master of Arts in Teaching in reading and language arts, and the Master of Education in three areas: early childhood; curriculum, instruction and leadership; and special education. For information on these programs, see the *Oakland University Graduate Catalog*.

Additional Services

Advising Center

The School of Education and Human Services (SEHS) Advising Center (143 O'Dowd Hall, 370-4182) is responsible for providing academic advising and career counseling for students in the Bachelor of Science degree in elementary education and secondary education, initial certification for second undergraduate degree students, and the Bachelor of Science degree in human resource development with specializations in human services and training and development.

Continuum Center

The Continuum Center (370-3033) provides topical and changing adult training workshops and seminars of personal enrichment, professional development, and career-related guidance and counseling. All Continuum Center training offers CEUs, and special programs offer National Certified Counselor continuing education contact hours and other professional credits necessary for certification.

Under contract to business, the Continuum Center develops training sessions and delivers them on site. In addition, the Center researches, develops and administers grant-funded projects, and develops and produces educational materials.

Workshops and conferences are designed and presented for professional audiences and for targeted needs of the community.

Individual career counseling is a continuously available service.

Lowry Center for Early Childhood Education

The Lowry Center for Early Childhood Education (370-4100) provides year round developmental programs for young children, toddlers through kindergarten-age, and a science, mathematics and technology summer day camp for children aged three to eight. 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 Education and Human Services human development and child studies courses.

Ken Morris Center for the Study of Labor and Work

The Ken Morris Center for the Study of Labor and Work (306 O'Dowd Hall, 370-3124) provides teaching, research, consultation and public service activities for labor organizations and their members. It coordinates the Concentration in Labor Studies and oversees other credit and non-credit courses, primarily for adult working students who are active in unions. Courses, conferences, residential institutes and special lectures and training, taught at on- and off-campus locations, are offered on topics related to work, the needs of working people and labor organizations, and other areas of special concern to union members, leaders and staff.

Institute for Action Research and Professional Development

The Institute for Action Research and Professional Development (Varner House, 370-4233) 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.

Field Placements and Internships

The Office of Field Placements (505 O'Dowd Hall, 370-3083) is responsible for the placement of pre-service interns.

Educational Resources Laboratory

The Educational Resources Laboratory (216 O'Dowd Hall, 370-2485) provides support for the academic, research and development activities of the School of Education and Human Services. Patrons are provided with a functional setting for the examination, study, research, development, production, and evaluation of instructional materials and technologies. Workshops, seminars and consultation services in instructional technology are available.

DEPARTMENT OF CURRICULUM, INSTRUCTION AND LEADERSHIP

508 O'DOWD HALL
(248) 370-3070
Fax: (248) 370-4605

Chairperson: *Eric J. Follo*

Professor emeritus: *Patrick J. Johnson*

Professors: *James W. Hughes, Jacqueline I. Lougheed, Sharon P. Muir, Sandra Packard*

Associate professors: *Eric J. Follo, Sarah L. Gibson, William Keane, Dawn M. Pickard, Dyanne M. Tracy*

Assistant professors: *Rhonda M. Blackwell-Flanagan, William Hoerr, Dennis B. Travis, Robert A. Wiggins*

Visiting assistant professor: *Helene Mills*

Adjunct professor: *Asa Hillard*

General Information

The Department of Curriculum, Instruction and Leadership offers programs designed to prepare students for careers in elementary and secondary school teaching. Both programs are approved by the National Council for Accreditation of Teacher Education (NCATE) and the Michigan Department of Education.

The undergraduate elementary education program enables students to earn concurrently a Bachelor of Science degree from Oakland University and recommendation for a Michigan elementary provisional certificate (see *Michigan Teacher Certification*). Students wishing to obtain an elementary provisional certificate and who hold a bachelor's degree pursue the program as second undergraduates.

The department offers a fifth-year program that prepares students majoring in selected academic fields in the College of Arts and Sciences for recommendation for a Michigan secondary provisional teaching certificate.

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

Pre-elementary education

Students who wish to pursue an elementary education major are admitted by the Admissions Office. Students so admitted are given pre-elementary education status. Students who hold a baccalaureate degree in another discipline also apply through the Admissions Office as second undergraduates with department approval. Second undergraduate students must meet the undergraduate degree program requirements. After admission as second undergraduates, students meet with personnel in the SEHS Advising Center (143 O'Dowd Hall, 370-4182) to determine equivalencies from their baccalaureate program.

Elementary education candidacy

Admission to elementary education candidacy is a prerequisite for some courses in the elementary education major (see course descriptions or *Schedule of Classes*). Students who hold pre-elementary education status must satisfy three criteria for admission to elementary education candidacy:

1. Achieve a grade point average (GPA) of at least 2.70, including a minimum grade of 2.0 in all courses. The GPA must represent at least 24 credits and include all courses completed at Oakland University and all previous colleges at the time the student applies for candidacy. Education courses will not be considered.
2. Earn the minimum score established by the department for the Michigan Teacher Test for Certification (MTTC) Program in Basic Skills. Information on test registration is available from the SEHS Advising Center.
3. Complete the writing proficiency requirement.

To obtain candidacy in elementary education, students present the original MTTC Basic Skills score report to the SEHS Advising Center. Students retain candidacy status so long as the GPA needed for admission to the major is maintained. Students who lose candidacy are reassigned to pre-elementary education status. Personnel in the SEHS Advising Center provide academic advice for elementary education candidates.

Admission to the major

Students who have elementary education candidacy status must complete EED 310 before applying for the major or professional program.

Admission, which occurs once each year, is selective; meeting the minimum requirements does not guarantee admission to the major.

Minimum criteria for admission to the major are:

1. Candidacy in elementary education
2. Completion of all general education requirements
3. A minimum of 70 documented clock hours' experience working with children in non-custodial activities, 50 hours within the last three years and 20 hours during the calendar year prior to application. Field experience in EED 310 does not meet this requirement. Examples of activities and documentation forms are available from the SEHS Advising Center.
4. 2.0 minimum grade in each course
5. Minimum grade of 2.8 in EED 310
6. Submission of a completed application by the published deadline.

Qualitative criteria may be required as well. Preference may be given to students who have completed a majority of their credits at Oakland University. The program seeks students who are committed to teaching in a multicultural school or district. Under-represented students are especially encouraged to apply.

Advising

The SEHS Advising Center is located in 143 O'Dowd Hall (370-4182). All first year and transfer students are required to attend an orientation to plan their first semester courses. During the first semester at Oakland, students should schedule an advising appointment to review the program plan and degree requirements. In subsequent semesters, students should schedule advising appointments far in advance of early registration time so that the staff may adequately serve their needs.

Program requirements

Admission to the major is required before beginning a four-semester professional sequence. Pre-elementary education students plan their course work with an adviser in the SEHS Advising Center. To earn the B.S. degree, they must:

1. Complete a minimum of 124 credits. At least 32 credits, including the last 8, must be taken at Oakland University and at least 32 credits must be at the 300-level or above. Education credits may not be older than six years upon completion of the program. Courses transferred from NCATE-accredited colleges may be approved.
2. Meet university general education requirements, including special general education requirements for elementary education majors (described below).
3. Complete the university ethnic diversity requirement.
4. Complete a teaching major or two teaching minors (described below).
5. Complete preprofessional and professional course work.
6. Earn a minimum grade of 2.0 in each non-education course, a minimum grade of 2.0 in EED 455 (2.8 required for certification), and a minimum grade of 2.8 in each remaining preprofessional and professional course; maintain a 2.70 GPA in non-education courses.
7. Maintain a cumulative GPA of at least 2.70.
8. Be in compliance with all legal curricular requirements for Michigan certification.

General education

Elementary education majors must take STA 225 to meet the university general education requirement in mathematics. **Recommended** course work in other areas follows:

Literature: Choose one from ENG 100, 224 or 241
Language: ALS 176 is preferred unless modern language is a teaching major or minor.
Western Civilization: HST 114 or 115
Social Science: Either PS 100 or ECN 200
Natural Science/Technology: Choose one from BIO 104, 110, 111, 113, 300 or CHM 300.
Art: Any course listed in the catalog that meets the requirement
International Studies: Any course listed in the catalog that meets the requirement

Some general education courses fulfull major/minor requirements. Please see your adviser before selecting courses.

Teaching majors/minors

In keeping with state requirements, one teaching major or two teaching minors selected from the following are required for certification. A teaching major/minor identifies subjects that a graduate is certified to teach in grades 6-8. Course work is limited to the classes listed and those on the approved list available in the advising office.

Language arts teaching minor (24 credits) — RDG 332; ALS 176; 4 credits of literature from ENG 100, 105, 111, 214, 220, 224, 241, 301, 303; and 12 credits from approved electives in COM, ENG, JRN, RDG or THA.

Language arts teaching major (36 credits) — Meet requirements of the language arts minor plus 12 additional credits selected from literature or language arts minor electives.

Mathematics teaching minor (20 credits) — MTE 210, 211, 410; MTH 141; STA 225. Students who test out of MTH 141 must elect one additional course from approved electives in APM, CSE, MTE, MTH or STA.

Mathematics teaching major (30 credits) — Meet requirements of the mathematics minor plus at least 10 credits from approved electives in APM, CSE, MTE, MTH, or STA.

Modern languages teaching minor (24 credits) — All credits must be in one language: FRH, GRM, RUS or SPN; 8 must be at the 300-400 level.

Modern languages teaching major (36 credits) — Meet requirements of the modern languages minor plus an additional 12 credits at the 300-400 level.

Science teaching minor (24 credits) — SCS 105; 4 credits from BIO; 4 credits from CHM; 4 credits from ENV; 8 credits from PHY.

Science teaching major (36 credits) — Meet requirements of the science minor plus an additional 12 approved elective science credits.

Social studies teaching minor (24 credits)— ENC 200/201; GEO 106 or 200 plus one additional approved course; HST 114/115; PS 100 plus any additional PS course. If additional elective credits are needed, they should be selected from economics, geography, history, or political science.

Social studies teaching major (36 credits) — Meet requirements for the social studies teaching minor plus additional approved credits in economics, geography, history, or political science.

An additional teaching major or minor in fine arts may be added to the certificate. Students may pursue a general concentration of art, music and theatre or a specialized concentration in one area — art, music or theatre.

Fine arts general teaching minor (24 credits) — 4 credits AH; 4 credits SA; 4 credits MUT or MUS excluding music education; 4 credits MUE and/or MUA except MUA 373; 4 credits THA 100, 110, 220 or 310; 4 credits THA 210, 213 or 300.

Fine arts specialized teaching minor (24 credits) — All credits are in one area — art, music or theatre — including a minimum of 8 credits in history, theory, literature or appreciation (AH or MUT, MUS or THA 100, 300, 301, 302) and a minimum of 8 credits in application or performance (SA or MUE, MUA except MUA 373, or THA 110, 210, 213, 220 or 310).

Fine arts general teaching major (36 credits) — Meet requirements of the fine arts general minor plus 4 credits AH or SA; 4 credits MUA, MUT or MUS including music education; 4 credits THA.

Fine arts specialized teaching major (36 credits) — Meet requirements of the fine arts specialized minor plus 12 credits in the same area — art, music or theatre — with prior approval of an adviser.

Professional program

Upon being admitted to the program, students are expected to maintain continuous enrollment during the fall and winter semesters in at least two professional education courses. Any waiver to this policy must be approved by the Advising Center before the term for which the waiver is requested. Students must follow the required sequence of courses provided at the time of admission. Prerequisites are required for some professional education courses. See course offerings for prerequisites and corequisites.

Retention in the program is based on student demonstration of the characteristics and conduct of members of the teaching profession. **Students may be removed from the program upon demonstrating professional incompetence.** Professional incompetence includes, but may not be limited to, deficiencies in any of the following areas:

1. Knowledge of the subject taught
2. The ability to impart that knowledge

3. The manner and efficacy of discipline in the elementary classroom
4. Rapport and communicationwith students in the elementary classroom, as well as parents, faculty, administrators and staff
5. Physical and mental abilities to perform the functions of a teacher.

Professional incompetence will be grounds for not recommending students for certification.

Field placements: Participation in field placements is required during EED 310 and each semester during which students enroll in a professional education class. The department arranges placements that ensure a variety of experiences, including two in urban school districts: Detroit and Pontiac.

Internship: EED 455 must be taken in the final semester of the degree program. **Application for the internship, EED 455, must be made one full semester in advance of the intended enrollment.** Students must contact the department for the date of the required orientation meeting (early each semester) at which application is made. Admission criteria for the internship are: a) satisfactory grade point average and minimum required grades; b) completion of all professional education course work and field placements; and c) completion of all required course work for the teaching major and/or minors. EED 455 may not be repeated.

Students must obtain written permission from the Advising Office to enroll in more than 12 credits during the internship semester. A minimum grade of 2.0 in EED 455 is required for graduation, a minimum grade of 2.8 for certification. Students who do not earn the minimum grade for certification can earn a B.S. without certification.

Michigan teacher certification

To be recommended for a provisional elementary certificate, elementary education majors must successfully complete requirements for the B.S., complete the required courses in either one major, or two minor concentration areas, earn a minimum grade of 2.8 in EED 455, and successfully pass the elementary education portion of the state MTTC exam. To be recommended for content area endorsements to the elementary education certificate, students must also successfully pass the subject area tests required by the state. Applicants should be aware that a conviction for a felony or for a misdemeanor involving moral turpitude of a minor may constitute grounds for denial of a certificate by the State of Michigan.

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

Course Offerings

For FE and SE course descriptions, see the Department of Human Development and Child Studies; for RDG and IST courses, see the Department of Reading and Language Arts.

The department offers courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

ELEMENTARY EDUCATION

EED 302 Teaching Mathematics in the Elementary School (4)
Assists prospective teachers in developing sound pedagogical strategies and instructional techniques for teaching mathematics in the elementary school. Includes a required field experience.
Prerequisite: Admission to major, EED 354, 420; FE 210, 215; MTE 210; SCS 105; SE 355.
Either prerequisite or corequisite: IST 396; RDG 331, 333.

EED 305 Teaching Science to Children (4)
Develops philosophies, rationale and methods for teaching elementary school science. Explores knowledge and skills for planning instruction, using instructional models, integrating the curriculum, using current instructional materials and evaluating outcomes. Includes a required field experience and a weekend field trip; additional field experiences available.
Prerequisite: Admission to major, EED 354, 420; FE 210, 215; MTE 210; SCS 105; SE 355.
Either prerequisite or corequisite: IST 396; RDG 331, 333.

EED 310 Public Education for the Future (4)
Assists pre-elementary education majors in deciding whether or not to pursue education as a career. Examines, through lectures and extensive written assignments, topics pertaining to public education. Includes a required field experience.
Prerequisite: Oakland University writing proficiency and elementary education candidacy.

EED 354 Testing and Assessment for Teachers (4)
Prepares a teacher-in-training to make effective use of formal and informal teacher-created assessment techniques in the process of planning, implementing and evaluating instruction based on outcomes. Includes a required field experience.
Prerequisite: Admission to major.

EED 420 Interaction Laboratory for Teacher Development (4)
Acquaints prospective teachers with the importance of human interactive skills, including sensitivity to cultural differences. Provides understanding of the flexible line separating personal and professional behavior. Includes student involvement in role-playing and action-oriented problem solving. Includes a required field experience.
Prerequisite: Admission to major.

EED 455 Internship in Elementary Education (12)
Provides teaching and other appropriate activities in an area classroom with guidance by a university supervisor and a cooperating teacher. General and specific instructional concerns of interns are explored in five or more concurrent seminars. Completion of a program evaluation survey is required before a grade is reported to the registrar. May not be repeated.
Prerequisite: See program requirements — internship.

EED 470 Teaching Social Studies in the Elementary School (4)
Examines instructional objectives and strategies, curriculum materials and evaluative procedures for social studies education. Upon completion of the course, students are able to develop, defend and implement an elementary social studies program. Includes a required field experience. *Satisfies the university ethnic diversity requirement.*
Prerequisite: Admission to major, EED 354, 420; FE 210, 215; MTE 210; SCS 105; SE 355.
Either prerequisite or corequisite: IST 396; RDG 331, 333.

EED 481 Gender Socialization in Schools (4)
Provides an understanding of the role gender plays in teaching and learning, with emphasis upon socialization of girls and women in schools. Assists prospective teachers, parents and others in designing programs that reduce gender bias in our educational system. Identical with WS 481.

EED 490 Independent Study (1, 2, 3 or 4)
Pursues directed individual reading and research. May include a field placement as well as development of specific teaching materials. May be repeated for a total of 4 credits.
Prerequisite: Permission of department (present written consent by faculty who will supervise study).

SCIENCE STUDIES

SCS 105 Science for the Elementary Teacher (4)
Develops science concepts and processes based on recent elementary school curricula in the fields of earth, physical and chemical science. For elementary education majors only; includes laboratory experiences.
Prerequisite: Elementary education candidacy.

SCS 306 Environmental/Outdoor Education for Elementary/Middle School Levels (4)
Methods, materials and sites for teaching science-related topics in an environmental/outdoor context. Topics may include terrestrial and aquatic ecology, water quality studies, bringing the outdoors indoors, and program planning. Field trips are included.
Prerequisite: SCS 105 or permission of instructor.

SCS 490 Independent Problems in Science Education (1, 2, 3 or 4)
Individual work in science for educators. Credits may be applied to a major or minor in science for teachers. May be repeated for a total of 4 credits.
Prerequisite: Permission of instructor.

Secondary Education (OU STEP)

Program Coordinator: *William A. Hoerr*

Program description

The School of Education and Human Services and the College of Arts and Sciences offer a fifth-year secondary teacher education program (Oakland University STEP) leading to recommendation for Michigan secondary provisional teacher certification. This certification is valid for teaching content area majors and minors in grades 7-12, except music, which is valid for grades K-12. The major areas in which Oakland program participants may become certified to teach are: biology, chemistry, English, French, German, history, mathematics, music, physics, Russian and Spanish. Students interested in music education need to contact the Department of Music, Theatre and Dance to learn about content-specific course and sequence requirements.

After completing requirements for graduation in their major and minor teaching areas, and preliminary professional education course work, students engage in a year-long internship in the public schools which includes both courses and field experiences, and fulfills requirements for certification.

Prospective applicants considering education beyond teacher certification should note that 8 credits of STEP professional coursework can be applied directly to a program leading to a master's degree in education. The conditions under which this is applicable, and additional information on the education master's program, can be obtained by contacting the program coordinator.

Program requirements

Both undergraduates, and students who have completed undergraduate degrees from Oakland or other universities (second undergraduate degree candidates) are eligible to apply. Both groups must fulfill all Oakland requirements for a baccalaureate degree in an approved major (listed above) prior to beginning their internship year. In addition, they must complete a teaching minor in one of the following areas: biology, chemistry, computer science, dance, English, history, mathematics, modern languages, physics, political science or speech. For details on specific major and minor course requirements, consult the applicable College of Arts and Sciences departmental listings in this catalog. For details on the teaching minor in computer science, consult the School of Engineering and Computer Science section.

The program also requires 38 credits in professional education coursework. Program coursework includes courses which are taken prior to the start of the internship, and which may be taken while students are completing their other degree requirements.

These are:

SED 300	Introduction to Secondary Education	(4)
FE 345	Educational Psychology for Secondary Teachers	(4)
RDG 338	Teaching Reading in the Content Areas	(4)
SED 427	Methods of Teaching Secondary Students	(2)

SE 501	The Exceptional Student	(4)

Internship year courses include:

SED 428	Teaching of the Major Field	(4)
FE 602	Philosophy in Education	(4)
SED 455	Field Component	(12)

Undergraduates who will be receiving their degrees from Oakland may choose to graduate either before or after their internship year. Undergraduates who receive financial aid, particularly, will want to weigh the costs and benefits of graduation options. Second undergraduate degree candidates completing majors and or minors may be required to complete additional coursework at Oakland and to satisfy residency requirements. Students should consult with advisers in their content areas to learn more about this.

Program sequence

Undergraduates will typically take the education courses in the following sequence:

Junior year, fall or winter semester	SED 300
Senior year, winter semester	FE 345 and RDG 538
Senior year, spring semester	SED 427 and SE 501
Internship (fall, winter and spring semesters)	SED 455 (full year), SED 428 (fall), and FE 602 (spring)

Second undergraduate degree candidates may have the option of completing pre-internship coursework on an accelerated schedule. These applicants should contact the program coordinator to learn about options applicable to their individual circumstances.

Application process

Undergraduate students may begin the application process as early as the second semester of their sophomore year. To be formally admitted, however, students must have completed or be enrolled in SED 300. Second undergraduate degree students may apply at any time with the same qualification. Second undergraduate degree students please note: Admission to the STEP and admission to the university involve separate processes. These students should contact the university admissions office for information about the application process.

Generally, eligibility for admission to the STEP requires a GPA of 3.00 in both the major and minor, and an overall GPA of 2.80. No single major or minor course grade may be below 2.0. Students with GPAs below these levels may become eligible but should plan to meet with the secondary education coordinator to discuss their circumstances before they begin the application process.

A number of factors are considered in the applicant selection process. These include GPA, written responses to a set of application questions, letters of recommendation and scores on the Michigan tests for teacher certification. Additional information or an interview may be requested to provide a more complete applicant profile. To progress into the internship, students admitted to the STEP must maintain a 3.00 minimum GPA in program courses, receive favorable recommendations from course instructors and early field experience cooperating teachers, and interview successfully for a school placement. If, after being admitted to the STEP, students' GPAs drop below an acceptable level or they receive a grade lower than a 2.0 in a course applied to their major or minor, their program status will be placed on hold until such deficiencies are remedied.

Applications for winter semester admissions must be received by October 15, and for fall semester admissions by March 15. The deadline to apply for a given internship year is Oct. 15 of the year before. Application packets are available in the College of Arts and Sciences Advising Office (211 Varner, 370-4567) and the School of Education and Human Services Advising Office (143 O'Dowd, 370-4182).

Course Offerings

The department offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

Descriptions of courses designated FE and SE appear under the Department of Human Development and Child Studies. RDG courses appear under the Department of Reading and Language Arts. Courses above the 400 level are described in the graduate catalog.

SED 300 Introduction to Secondary Education (4)
Introduces secondary teaching as a profession and career, exploring topics and issues in secondary education. Requires 50 clock hours of observation and experience in local high school classrooms.

SED 427 Methods of Teaching Secondary Students (2)
Emphasizes the development of teaching strategies and human interaction techniques unique to secondary students and classrooms. Topics include discipline, motivation, instructional technology, skill assessment, evaluation and affective learning.
Prerequisite: Admission to secondary education.

SED 428 Teaching of the Major Field (4)
Develops specific knowledge, competencies and skills required for effective teaching in the student's major field.
Prerequisite: Admission to secondary education.

SED 455 Internship in Secondary Education (4-12)
Provides an academic year internship in an assigned school district under the guidance of a clinical instructor and university instructor. Enrollment for a total of 12 credits is required for completion of the internship.
Prerequisite: Admission to the internship.

DEPARTMENT OF HUMAN DEVELOPMENT AND CHILD STUDIES

529 O'DOWD HALL (248) 370-3077

Chairperson: *Ronald M. Swartz*

Distinguished professor emeritus: *Laszlo J. Hetenyi*

Professor emeritus: *Edward A. Bantel*

Professors: *Gerald G. Freeman, Donald M. Miller, Ronald M. Swartz*

Associate professors: *Marc Briod, Andrew S. Gunsberg, Richard C. Pipan, Carol A. Swift*

Assistant professors: *Sandra Alber, Anna Kirova-Petrova, Shannan McNair*

Visiting assistant professor: *Ambika Bhargava*

Special instructor: *Carrie Owens*

Within the School of Education and Human Services, the faculty of the Department of Human Development and Child Studies offer courses in educational foundations and special education at the undergraduate level for students pursuing a career in teaching. The department houses master's degree programs in early childhood education and special education; these graduate programs can provide teaching certificate endorsements and/or professional education certification requirements.

Course Offerings

The department offers selected courses form this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

FOUNDATIONS OF EDUCATION

FE 210 Social and Philosophical Issues in Elementary Education (4)
Study of elementary education in broad perspective, as both an interpersonal activity and a social institution. Topics include immediate and ultimate aims of elementary education, social and cultural differences within and between schools, and assumptions underlying school policy. Not to be taken concurrently with FE 215.
Prerequisite: Admission to elementary education and satisfaction of the university writing proficiency requirement.

FE 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 and early adolescence. Includes a required field experience.
Prerequisite: Admission to elementary education and satisfaction of the university writing proficiency requirement.

FE 301 Human Nature (4)
An analysis of human nature through evolutionary, developmental, cultural and philosophical perspectives. Implications for the helping professions.

FE 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, social and cultural differences within and between schools, and assumptions underlying school policy.

FE 345 Educational Psychology for Secondary Teachers (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. Attention to regular and exceptional development during the adolescent years.

SPECIAL EDUCATION

SE 355 Identifying Learning and Behavior Differences in Students (4)
Familiarizes students with the characteristics of all types of exceptional students, including the gifted and talented. Introduces special education law and services for handicapped persons. Requires field placement in a special education setting where students practice informal observation and assessment techniques for determining individual differences.
Prerequisite: Admission to major.

DEPARTMENT OF HUMAN RESOURCE DEVELOPMENT

137 O'DOWD HALL (248) 370-4170

Chairperson: *Billy Joe Minor*

Professors emeriti: *David P. Meyer, William F. Moorhouse, Robert G. Payne*

Associate professors: *Susan M. Awbrey, F. James Clatworthy, William C. Fish, Michael P. Long, Billy Joe Minor, James Quinn*

Visiting assistant professor: *Constantine Kontoghiorghes*

Special Instructor: *Sandra L. McClurg*

Instructor: *Paul Fu*

Visiting instructor: *Maria Cseh*

The Human Resource Development (HRD) Department of the School of Education and Human Services offers a Bachelor of Science degree in human resource development with specializations in human services, and training and development. The human services specialization prepares professionals for careers in which they use behavioral sciences and human relations knowledge and skills to facilitate human growth and development. The training and development specialization prepares professionals for careers in training and human development in which they design, deliver and evaluate training programs that promise to maximize human development and organizational effectiveness.

Both specializations promote the attainment of technical, interpersonal and conceptual knowledge and skill to respond to human needs and aspirations in an era of rapid social change.

Advising

The School of Education and Human Services Advising Center is located in 143 O'Dowd Hall (370-3066). Upon entering the HRD program, students should schedule an advising appointment to develop and review the program plan and degree requirements.

Requirements for the Bachelor of Science degree with a major in human resource development

The curriculum described shall be followed by students admitted to pre-HRD status. Students admitted to pre-HRD status prior to fall 1998 may choose to satisfy either the degree requirements listed in this catalog or those in the catalog of the academic year in which they were initially admitted to pre-HRD status (or any catalog during the interim), provided that catalog is not more than six years old at the time of graduation. Students who transfer to the School of Education and Human Services after admission to the university or who are readmitted to the university are required to follow the requirements of the catalog in effect at the time they transfer or are readmitted.

Students are encouraged to meet with an adviser on a regular basis. A senior program audit should be obtained from the school's academic adviser at the beginning of the student's senior year, or one year before planned graduation. The responsibility for meeting graduation requirements rests with the student.

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

1. Complete a minimum of 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 the last 8 credits needed to complete the baccalaureate degree requirements at Oakland University
5. Have a cumulative grade point average of at least 2.50
6. Satisfy the writing proficiency requirement (see *Undergraduate degree requirements*)
7. Complete the university general education requirement of 32 credits (see *Undergraduate degree requirements*)
8. Satisfy the university ethnic diversity requirement (HRD 367 in the HRD core satisfies this requirement.)
9. Complete the human resource development core requirements with a minimum grade of 2.5 in each course and apply for admission to specialization status. (See *Requirements for admission to specialization)*
10. Complete the major specialization requirements (human services or training and development)
11. Complete the professional development requirements
12. Complete the professional electives requirements
13. Complete the internship and field placement requirements
14. Complete courses required in categories 10-13 above with a minimum grade of 2.0 in each course and a cumulative GPA in these categories of 2.50.

Requirements for the human resource development (HRD) core

The HRD program requires the completion of a common core of courses that introduces important constructs and theoretical supports for human resource development. Writing across the HDR curriculum is a departmental priority and RHT 335, Writing for Human Resource Development Professionals, should be taken as one of the initial core courses. Students must earn a grade of 2.5 or better in each of the following core courses.

HI 351	Fundamentals of Human Interaction	4
HRD 367	Cultural Diversity in the Workplace (satisfies the university ethnic diversity requirement)	4
HRD 362	Assessment and Statistical Foundations in HRD	4
HRD 364/LE364	Career Development	4
RHT 335	Writing for Human Resource Professionals	4
		20

Requirements for admission to specialization (human services or training and development)

Students may apply for admission to one of the HRD specializations after satisfying the following requirements:

1. Completion of 32 credits at an accredited college or university with a grade point average (GPA) of 2.50 or better. Courses that carry no numerical or letter grade (such as S or U) are excluded from the calculation of the GPA.

2. Completion of the HRD core courses (20 hours) with a grade of 2.5 or better in each course
3. Satisfaction of the university writing requirement
4. Completion of the specialization application and plan of study.

To continue in a specialization, students must maintain a minimum overall GPA of 2.50.

Specialization in human services

In the field of human services, behavioral science and human relations knowledge and skills are used to help people maximize their potential for becoming contributing members of society. The human services specialization provides preparation for such diverse human development roles as employment and career counseling, personnel selection and performance evaluation, provision of community mental health and family services, substance abuse counseling, corrections, and labor and employment relations. In addition to course work in these areas, the specialization provides field work and internship opportunities in appropriate work settings. The human services specialization is approved by the Council for Standards in Human Service Education.

Specialization course requirements

To satisfy the requirements for the human services specialization, students must complete the HRD core, be admitted to the specialization, and complete the following specialization area requirements. Specialization courses must be completed with a minimum grade of 2.0 in each course and a cumulative GPA of 2.50 or better.

A. Specialization Courses (complete all 20 credits)

HI 363	Group Dynamics	4
HI 365	The Helping Interview: Techniques and Laboratory	4
HRD 302	Ethics and Personal Crisis	4
HRD 366	The Human Services	4
HRD 409	Information Management Systems	4
		20

B. Professional Development Courses (16 credits)

This requirement is satisfied by completing one course in each of the following four sections. This requirement may also be satisfied by completing a minor in labor and employment studies or a concentration in social services. No more than 12 credits of course work used to satisfy one major or minor may be applied toward another.

1. Human Development

HRD 301	Human Nature (4)
PSY 225	Introduction to Life Span Development Psychology (4)

2. Social Change

HRD 401	Change Process and Organizational Analysis (4)
LE 320	Introduction to Labor and Employment (4)
LE 321	Introduction to Labor and Employment in the Public Sector (4)
SOC 205	Current Social Problems (4)
SOC 314	The Social Context of Social Work (4)
SOC 315	Social Welfare Policies (4)
SOC 336	Sociology of Gender (4)
SOC 346	Communities (4)

3. **Leadership and Administrative Foundations**

HRD 411	Leadership and Administrative Practices (4)
LE 322	Study of Labor and Work Organizations (4)

4. **Human Service Populations**

HRD 335	Substance Abuse (4)
HRD 431	Death and Dying (4)
LE 326	Collective Bargaining and Dispute Resolution (4)
PSY 327	Socialization of the Family (4)
PSY 371	Work with the Elderly (4)
PSY 374	Psychology of Women (4)
SOC 240	Sociology of Crime and Punishment (4)
SOC 331	Racial and Ethnic Relations (4)
SOC 335	The Family (4)
SOC 465	Sociological Perspectives on Aging(4)
WS 300	Women in Transition (4)

C. **Professional Electives** (4 credits)

D. **Field Work** (6 or 8 credits)
Complete a minimum of 6 credits in field placement (HRD 369) for a total of 320 clock hours. Applications must be submitted by the designated deadline.

E. **Internship** (8-12 credits)
Complete a minimum of 8 credits or maximum of 12 credits in a placement site for a total of 320 to 480 clock hours. Students enrolled in a student-initiated site may not take more than 8 credits for the internship and may be required to structure the internship as an action research project if the site is the student's place of employment. Applications must be submitted by the designated deadline.

Specialization in training and development

Training and development is the process of systematically developing human resources within a work organization to improve performance. A key objective of this specialization is student acquisition of the ability to design, deliver and evaluate training programs. The specialization in training and development requires course work in behavioral sciences, human relations, instructional design and program delivery. The specialization provides preparation for a variety of careers in government, health and human services, and in business and industry.

An internship during the senior year provides work experience in an appropriate setting.

Specialization course requirements

To satisfy the requirements for the training and development specialization, students must complete the HRD core, be admitted to the specialization and complete the following specialization area requirements. Specialization courses must be completed with a minimum grade of 2.0 in each course and a cumulative GPA of 2.50 or better.

A. **Specialization Courses** (complete all 20 credits)

HI 363	Group Dynamics	4
or	or	
HI 365	The Helping Interview Techniques & Laboratory	
HRD 303	Ethics in Training and Development	4
HRD 306	Introduction to Training and Development	4
HRD 310	Training Design	4

HRD 423	Instructional Methods and Presentation Techniques	4
		20

B. Professional Development Courses (19-20 credits)

This requirement is satisfied by completing one course in each of the following five sections. This requirement can also be satisfied by completing a minor in Labor and Employment Studies, General Business or Human Resource Management. No more than 12 credits of course work from the courses listed below may be used to satisfy the requirements for another major or minor.

1. **Organizational Theory**

HRD 401	Change Process and Organizational Analysis (4)
HRD 411	Leadership and Administrative Practices (4)
HRD 440	Strategic Planning (4)
LE 322	Study of Labor and Work Organizations (4)
ORG 330	Introduction to Organizational Behavior (3)

2. **Planning and Evaluation**

HRD 402	Program Planning and Evaluation (4)
PSY 250	Introduction to Research Design (4)
STA 225	Introduction to Statistical Concepts and Reasoning (4)

3. **Labor Relations and Employee Involvement**

HST 302	American Labor History (4)
LE 324	Work and the Law (4)
LE 326	Collective Bargaining and Dispute Resolution (4)
LE 328	Employment Regulations and Benefits (4)
SOC 350	The Transformation of the Workplace (4)
SOC 354	Quality of Work Life (4)

4. **Computer Literacy**

CSE 125	Introduction to Computer Use (4)
CSE 130	Introduction to Computer Programming (4)
HRD 470	Using Computers in Training and Development (4)

5. **Development Process**

HI 464	Consultation (4)
HRD 368	Work and Training Development (4)

C. Professional Electives (8 credits)

D. Internship (8-12 credits)

Complete a minimum of 8 credits or maximum of 12 credits in a placement site for a total of 320 to 480 clock hours. Students enrolled in a student-initiated site may not take more than 8 credits for internship and may be required to structure the internship as an action research project if the site is the student's place of employment. Applications must be submitted by the designated deadline.

Minor in human resource development

The School of Education and Human Services offers a minor in human resource development for students who wish to strengthen their academic majors with course work in human relations and training and development.

To obtain a minor in human resource development, students must earn at least 24 credits in human interaction (HI) and human resource development (HRD) courses, including a minimum of 8 credits in each area; the plan of study is subject to the approval of the coordinator for the HRD minor. Courses counted towards the minor must have a cumulative grade point average of 2.50 or better with no grade lower than 2.0.

Minor in labor and employment studies

Labor and employment studies is an interdisciplinary minor which provides an academic background for understanding the empirical and theoretical bases of the employee/employer relationship and labor organizations. This program may be particularly useful to individuals interested in the operational aspects of employment including the law, collective bargaining, personnel practices, and the dynamics of staff, leadership and participative roles.

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

This minor requires 23-24 credits distributed among the following three areas of preparation with a minimum grade of 2.0 in each course.

1. Core (16 credits)
   a. Must take one of the following:

LE 320	Introduction to Labor and Employment (4)
LE 321	Introduction to Labor and Employment in the Public Sector (4)

   b. Select at least 3 of the following:

LE 322	Study of Labor and Work Organizations (4)
LE 324	Work and the Law (4)
LE 326	Collective Bargaining and Dispute Resolution (4)
LE 328	Employment Regulations and Benefits (4)
LE364/HRD 364	Career Development (4)

In addition, students must make selections of one course each in the following two areas to satisfy the remaining requirements of the minor:

2. **Organizational Theory and Practice and Work Life Processes**

COM 202	Group Dynamics and Communication (4)
COM 304	Communication in Organizations (4)
HI 363	Dynamics of Group Relationships (4)
HI 464	Consultation (4)
HRD 401	Change Process and Organizational Analysis (4)
IHS 311	Industrial Safety Technology (3)
ORG 330	Introduction to Organizational Behavior (3)
SOC 350	The Transformation of the Workplace (4)
SOC 354	Quality of Work Life (4)
SOC 359	Human Factors in Quality Control (4)
SOC 381	Theories of Modern Organizations (4)

3. **Community and Society**

HRD 335	Substance Abuse (4)
HRD 367	Cultural Diversity in the Workplace (4)
HST 302	American Labor History (3)
PS 110	Contemporary Political Issues (4)
PSY 375	Psychology of Women (4)
SOC 331	Racial and Ethnic Relations (4)
SOC 357	Industrial Sociology (4)
SOC 445	Contemporary Work Roles, Careers and Labor Markets (4)

Related minors and concentrations

Students who wish to obtain more than one minor must obtain the approval of the human resource development program adviser.

Departmental honors

HRD departmental honors are available to students who meet the following standards: a 3.50 or higher cumulative average for all courses taken at Oakland University; a 3.70 or higher cumulative average in HRD Department courses (i.e. HI, HRD, LE, excluding HRD 490).

Course Offerings

The department offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

HUMAN INTERACTION

HI 351 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 363 Group Dynamics (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 351 or equivalent.

HI 365 The Helping Interview: Techniques and Laboratory (4)
Designed to improve interpersonal communications skills, this course deals with basic principles of interviewing. It focuses on discussion of such interviewing skills as active listening, questioning, confronting and identifying both self-defeating behaviors and positive assets. Students practice interview skills in a supervised laboratory setting, and are videotaped and critiqued.
Prerequisite: HI 351 or equivalent.

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: Junior standing and HI 363 or 365.

HUMAN RESOURCE DEVELOPMENT

HRD 301 Human Nature (4)
The various ways in which human nature has been understood, with attention to the behavioral, humanistic, Marxist and Christian beliefs about humankind and their implications for policies and practices in the teaching and helping professions. Strives to develop tolerance for alternative views, and to appreciate the varieties of human behavior. Identical with PHL 301.
Prerequisite: RHT 160 or equivalent.

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. Identical with PHL 302.
Prerequisite: RHT 160 or equivalent.

HRD 303 Ethics in Training and Development (4)
Introduction to normative theories of ethics as they apply to the world of business and industry, ethical implications of capitalism as practiced in contemporary corporations, the primary moral dilemmas characteristic of today's workplace and how to solve ethical problems as potential professionals in training and development.
Prerequisite: RHT 160 or equivalent.

HRD 306 Introduction to Training and Design (4)
Introduction to strategic assumptions affecting training and design priorities. Investigates roles and competencies for trainers in human services and business and industry work settings. Promotes an understanding of the training and development field and the positioning of self as a potential trainer.

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.
Prerequisite: RHT 160 and HRD 306.

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 and Statistical Foundations in HRD (4)
Assessment is a process for collecting information to form judgments and make decisions. The aim of the course is to develop basic assessment/statistical literacy. This course will provide an opportunity for students to acquire basic knowledge, skills and attitudes needed to control assessment/statistical processes and make high quality decisions.

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 366 The Human Services (4)
Overview of human service work. Covers historical and philosophical bases, service populations, values and professional roles. Surveys conditions of healthy human functioning and deviancy, as well as service modalities, human systems and legislative issues.

HRD 367 Cultural Diversity in HRD (4)
Identifies relevant culture-specific issues related to race, gender, ethnicity, socioeconomic status and religion. Examines historical context of culture-specific issues (knowledge). Facilitates awareness of values and their significance in helping relationships (self awareness). Presents an ecological framework for developing effective practices (skills). *Satisfies the university ethnic diversity requirement.*
Prerequisite: HI 351.

HRD 368 Work and Training Development (4)
Study of the training function within business and industry. Emphasis is placed on the politics and organization of the training function in relationship to management, union and jointly funded projects.
Prerequisite: HRD 310 or permission of the instructor.

HRD 369 Field Work in HRD (2, 4, 6 or 8)
Intermediate-level supervised experiences in HRD settings, such as training and personnel departments in business, industry and government, employment offices and human service agencies. Students must submit application to the academic adviser by designated dates on field work application approximately three months prior to the semester in which the field work will be served. May be repeated for a total of 8 credits.
Prerequisite: Permission of instructor by application.

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 credits 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 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 409 Information Management Systems (4)
Acquaints the student with the information technology needs of the human service agency. Students learn the importance of creating information systems within the organization and how to select the hardware and software appropriate for running a small to midsized human service agency.

HRD 411 Leadership and Administrative Practices (4)
Focuses on the management of small to midsized human service agencies. Persons entering the field of human services are often called upon to act as directors of agencies and projects. This course helps prepare students for this role by providing an introduction to the skills necessary for administering an agency in the non-profit sector.

HRD 423 Instructional Methods (4)
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 instructional media.
Prerequisite: HRD 310.

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: Junior standing and 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: Junior standing and two HI or HRD courses.

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. Visiting 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 470 Using Computers in Training and Development (4)
Acquaints students with the use of instructional design to create individualized training that is delivered via computer. Provides beginning skills in the use of a computer authoring system to create a training module and in the selection of multimedia software and hardware.

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 the academic adviser by designated dates on internship application approximately three months prior to the semester in which the internship will be served. Exact deadlines are included on the application. May be repeated only with department permission.
Prerequisite: Senior standing in HRD, completion of core courses, a grade point average of at least 2.50, admission to specialization and permission of instructor by application.

LABOR EDUCATION

LE 320 Introduction to Labor and Employment Relations (4)
A study of the principles of both private and public sector labor relations. Includes discussions of the rights and responsibilities of all parties and traces labor relations through its origins and basic principles to current volatile issues and developing trends.

LE 321 Introduction to Public Sector Labor and Employment Relations (4)
A study of the principles of public sector labor relations. Concentrates on public employment relations in Michigan, and includes discussions of the rights and responsibilities of all parties and traces labor relations through its origins and basic principles to current volatile issues and developing trends.

LE 322 The Study of Labor and Work (4)
An in-depth study of employment systems and relationships, and employee organizations.

LE 324 Work and the Law (4)
A guide to the basic common law rights and responsibilities directly related to employment, as well as policies and procedures under the National Labor Relations Act. Includes a study of the principles used in employment related alternative dispute systems. Identical with SOC 324.

LE 326 Collective Bargaining and Dispute Resolution (4)
An in-depth study of the principles and practices of private and public sectors collective bargaining and dispute resolution including strategic planning and preparation, position formulation, negotiation techniques, and agreement/ratification processes. Exploration of employment dispute resolution through observation of formal arbitration presentations, decision-making exercises, and active participation in formal arbitration presentations.

LE 328 Employment Regulations and Benefits (4)
Study of laws, regulations, policies and procedures required by federal and state statute, keeping employment records, writing and maintaining employment handbooks, and the development of "Family Friendly" employment policies. Employment benefit packages are studied in relation to their economic and non-economic costs and compatibility with legal requirements and employee expectations.

DEPARTMENT OF READING AND LANGUAGE ARTS

453 O'DOWD HALL (248) 370-3065

Chairperson: *Robert M. Schwartz*

Professors emeriti: *Harold C. Cafone, George E. Coon, Harry T. Hahn*

Professors: *Jane M. Bingham, Ronald L. Cramer, W. Dorsey Hammond, Taffy E. Raphael, Robert M. Schwartz*

Associate professors: *Richard F. Barron, Gloria T. Blatt, Robert J. Christina, James R. Gavelek, Anne Porter, Toni S. Walters*

Assistant professor: *James F. Cipielewski, Linda M. Pavonetti, Joyce Wiencek*

Special instructor: *Sandra Biondo*

As a department within the School of Education and Human Services, the instructional staff of the Reading and Language Arts Department offers courses in reading, language arts, instructional systems technology and children's literature at the undergraduate level for students pursuing a career in teaching. The department offers a master's degree program in reading and language arts, certificate programs in microcomputer applications, post-master's certificate programs, K-12 reading endorsements and three master's degree programs combined with endorsements in learning disabilities, early childhood and Michigan administrator certification for elementary, middle and secondary principals, and a doctor of philosophy degree in reading.

Course Offerings

The department offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

RDG 331 Teaching of Reading (4)
Basic course in the teaching of reading in the elementary and middle grades. Content includes strategies for teaching comprehension, phonics, emerging literacy, methods of reading instruction, and other pertinent issues. Includes a required field experience. *Satisfies the university ethnic diversity requirement.*
Prerequisite: Admission to major and FE 215.
Corequisite: RDG 333.

RDG 332 Literature for Children (4)
Focuses on the critical evaluation of children's literature, understanding its history, assessing children's needs and developmental levels, and selecting and using quality literature with children.
Prerequisite: RHT 160 or equivalent.

RDG 333 Teaching the Language Arts (4)
Preparation for teaching language arts in elementary arts in elementary and middle grades. Content includes oral language development, listening, writing, spelling and the reading-writing connection. Includes a required field experience.
Prerequisite: Admission to major and FE 215.
Corequisite: RDG 331.

RDG 334 Teaching Writing in the Elementary and Secondary School (4)
Basic course in teaching the writing process. Students participate in writing workshops, discuss instructional issues and methods, and experience writing through personal engagement in the writing process.

RDG 338 Teaching Reading in the Content Areas (4)
Basic course in reading for secondary teachers. Focuses on the reading process, strategies and materials for teaching reading in English, social studies and other subjects to junior and senior high school students. Not open to elementary education majors. *Satisfies the university ethnic diversity requirement.*

RDG 414 Reading Appraisal in the Elementary Classroom (4)
Focuses on the assessment of reading. Uses formal and informal assessment instruments. Students learn to use assessment data to develop instructional programs. Specifically involves reading instruction with pupils and involvement with school personnel.
Prerequisite: RDG 331, 333.

RDG 490 Independent Study and Research (2 or 4)
Directed individual reading research. May be repeated for a maximum of 4 credits. Departmental permission required. Students must obtain written faculty agreement to supervise their study before permission is granted.
Prerequisite: RDG 331.

INSTRUCTIONAL SYSTEMS TECHNOLOGY

IST 396 Educational Uses of Microcomputers and Related Technologies (4)
Basic microcomputer literacy course. Focuses on educational applications. Prepares students to use microcomputers and related technologies for career and personal goals.

IST 399 Secondary Education - Uses of Microcomputers and Related Technologies (4)
A general microcomputer literacy course designed with focus on educational applications to enable secondary education students to utilize microcomputers and related technologies for career and personal goals. This course is a requirement of secondary education majors for the computer science minor.
Prerequisite: 12 credits in Computer Science.

IST 499 Final Project in Instructional Systems Technology (4)
Students, independently or in groups, formulate a project in an area of personal interest with practical application in the secondary classroom. Project proposals require instructor approval. Assistance is available **upon request**. Completed project must be presented at least two weeks before the end of classes in the semester of graduation.
Prerequisite: IST 399.

SCHOOL OF ENGINEERING AND COMPUTER SCIENCE

248 DODGE HALL
(248) 370-2212
Fax: (248) 370-4261

Dean: *Michael P. Polis*

Office of the Dean: *Bhushan L. Bhatt, associate dean; John K. Fischer, assistant to the dean; Patrick Bennett, academic adviser/program coordinator; Helen Ellison, engineering cooperative education coordinator*

Advisory Board

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

Robert T. Lentz, Ph.D., Chairperson, Advisory Board; Director, Vehicle Systems Engineering, General Dynamics Land Systems Division
William G. Agnew, Ph.D., Retired Director, General Motors Research Labs
Hadi A. Akeel, Ph.D., Senior Vice President and Chief Engineer, FANUC Robotics Corporation
Gerald Cilibraise, Executive Engineer, SCP/Electrical, Chrysler Corporation
Samuel L. Cole, III, Manager, Car Product Development, Ford Motor Company
Herbert H. Dobbs, Ph.D., Consultant, Rochester, Michigan
Philip M. Headley, Chief Engineer, Systems, ITT Automotive
Albert F. Houchens, Ph.D., Director, Fabrication Technology, GM Technical Center
Sidney D. Jeffe, Retired, Chrysler Corporation
Ronald P. Knockeart, Vice President, Intelligent Vehicle Highway Systems, Siemens Automotive
Thomas P. Mathues, Director of Engineering Brake Systems, ITT Automotive
Ron A. May, Assistant Vice President, Energy Delivery, Detroit Edison
Ronald L. McIntyre, Retired Director, Environmental Initiatives, Detroit Edison
Richard J. Puricelli, Chairman, Jac Products
Stephan Sharf, President, SICA
S. Carl Soderstrom, Jr., Vice President, Engineering & Quality, Meritor Automotive
James A. Supina, Consultant
Lawrence W. Tomczak, Vice President, Engineering, Lectron Products Inc.
Wallace K. Tsuha, Chairman and CEO, Saturn Electronics & Engineering, Inc.
Jeffery Van Dorn, Vice President, Engineering, Cardell Corporation
Arnold J. Vander Bok, Director, Electronic Systems, Detroit Diesel Corporation
John M. Vergoz, Vice President, Quality & Technology, The Budd Company
Thomas H. Vos, Director of Applied Technology, TRW Vehicle Safety Systems, Inc.

General Information

Accreditation

All academic programs of Oakland University are accredited by the North Central Association of Colleges and Schools. In addition, the undergraduate programs in computer, electrical, mechanical, manufacturing engineering option in mechanical, and systems engineering are accredited by the Engineering Accreditation Commission of the Accreditation

Board for Engineering and Technology (ABET), and the computer science program is accredited by the Computer Science Accreditation Commission of the Computing Sciences Accreditation Board (CSAB).

Undergraduate programs

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 minors in computer science and in computing for nonmajors.

Professional societies

The school has a number of professional societies such as the Association of Computing Machinery (ACM), Association of Unmanned Vehicle Systems (AUVS), American Society of Mechanical Engineers (ASME), Institute of Electrical and Electronics Engineers (IEEE), Society of Automotive Engineers (SAE), Society of Manufacturing Engineers (SME), Society of Women Engineers (SWE), National Society of Black Engineers (NSBE), National Society of Professional Engineers (NSPE), Theta Tau fraternity and honor societies Eta Kappa Nu and Tau Beta Pi. Students are encouraged to become active members of one or more of these organizations. For more details refer to the undergraduate student handbook of the school.

Graduate programs

The School of Engineering and Computer Science offers programs leading to the Master of Science degree in electrical and computer engineering, mechanical engineering, systems engineering, computer science and engineering, software engineering and the Doctor of Philosophy degree in systems engineering, which involves a blending of various disciplines. The school also offers a Master of Science degree in engineering management in cooperation with the School of Business Administration.

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

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.

Admission

High school preparation

Entering freshmen planning to major in engineering or computer science should have taken at least four 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, machine shop practice, computer programming and electronics shop courses are useful, but are not required for admission. Normally, a 3.00 (B average) is required for admission to programs in 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 their major department. Students may transfer applicable community college credits at any time during their course of study. However, at least one-half of the credits required for completion of a specific baccalaureate degree program must be from regionally accredited four year institutions, with at least 32 credits earned at Oakland University.

Students planning to transfer into one of the engineering programs should present the following: four semester courses in analytic geometry and calculus, including linear algebra and differential equations; two semester courses in introductory 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. Students planning to transfer from Oakland Community College (OCC) under the "2+2" program must meet specific requirements that are available in detail from the Admissions Office at OCC. Community college students who satisfy the MACRAO agreement generally need only 8 additional credits to satisfy Oakland University's general education requirements.

Students planning to transfer into the computer science program should complete one year of course work in calculus, one course in linear algebra, one course in discrete mathematics if possible and two semester courses in introductory college physics using calculus. A course in programming in a high-level language, such as C++, is desirable. Whenever possible, further

course work in computer science should be planned with an Oakland University adviser to ensure compatibility with university requirements.

See *Transfer student information* for additional information.

Internal transfer

Oakland University students wishing to transfer into programs in the School of Engineering and Computer Science from other majors or from undecided status will be considered upon the completion of the following courses: MTH 154, 155; PHY 151 and 152. A strong performance in all of the courses taken at Oakland University, especially in the above listed four courses in calculus and physics, is required for internal transfer.

Academic Advising and Plans of Study

The programs of study for all entering freshmen are focused toward acquiring math, science, writing and programming skills and thus follow a more or less uniform pattern. One of the early courses taken by engineering students is EGR 101, "Introduction to Engineering." This course is taught by faculty from all the departments of the school, thereby providing a perspective of their specialty areas and increasing students' awareness of the engineering profession. Students are encouraged to meet with the faculty and seek further clarification or professional advice.

Upon acquiring major standing (see below), students are assigned to a faculty adviser. It is mandatory for the students to consult their faculty advisers to plan a meaningful program of professional study in their major immediately after major standing has been granted.

In order to further facilitate the student-faculty interaction, one week of each term is designated as "Advising Week." This is normally the week before early registration during the fall and winter semesters. Failure to meet with his/her adviser, at least once during each fall and winter semester, will result in cancellation of the student's registration for the succeeding semester.

In consultation with the faculty advisers, engineering students should ensure that they acquire at least 16 credits of design while satisfying their overall program requirements. Design credits can be acquired through the study of various subjects. Similarly, computer science students should ensure that they meet various breadth and depth requirements in the advanced portion of their computer science curriculum. For each program, credits associated with relevant design experiences and those associated with various computer science categories are listed in the school's "Undergraduate Student Handbook" available from the advising office (159A Dodge Hall).

The school's academic advising office oversees specific program requirements. Students who have questions about transfer credit, academic standing, major standing, petitions or the details of degree requirements should consult the academic adviser in 159A Dodge Hall. Students of the School of Engineering and Computer Science must complete a Plan of Study form, which is a timetable of courses to be taken for undergraduate credit. They should complete the form as early as possible, but no later than the end of the semester in which they complete 48 credits. Transfer students should 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.

Degree Requirements

General requirements for the baccalaureate degrees

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

1. Complete at least 128 credits for all programs. 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:

   Computer, electrical, mechanical or systems engineering: at least 24 credits in engineering core or professional subjects required for the major, of which 16 must be design credits;

   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;

   Computer science: at least 20 credits in computer science courses required for the major.

3. Take the last 8 credits needed to complete baccalaureate requirements at Oakland University.

4. Demonstrate writing proficiency by meeting the university standard in English composition (see *Undergraduate degree requirements*).

5. Fulfill the university general education requirement (see below and *Undergraduate degree requirements)*.

6. Fulfill the university ethnic diversity requirement.

7. Be admitted to major standing in the major of the student's choice.

8. Complete the requirements specified for the elected major.

9. Earn a cumulative grade point average of at least 2.00 in courses taken at Oakland University.

10. Complete an Application for Degree at the Office of the Registrar and pay the graduation service fee.

General education

All Oakland University students must take a series of courses distributed across eight field groups for broad exposure to a liberal arts education. Engineering and computer science students automatically satisfy two of these groups (natural science and technology; mathematics, logic and computer science) by virtue of required courses. In addition to satisfying the remaining six groups, engineering and computer science students must arrange to acquire depth in a particular area of general education study. The requirements may be satisfied by selecting one of the course sequences listed below and choosing the remaining courses to span the field groups not represented.

American history and literature: HST 114 and ENG 224
(Western civilization and literature)
Asian arts and civilization: AH 104 and IS 210 or 220 or 240 or 270
(arts and international studies)
Asian literature and civilization: LIT 100 and IS 210 (or 220 or 240)
(literature and international studies)

Chinese civilization and its Communist transformation: IS 210 and PS 377 (international studies and Western civilization)
Classical mythology and philosophy: ENG 312 and PHL 204 (literature and Western civilization)
Comparative politics: PS 131 and PS 377 (Western civilization and social science)
Culture and society through film: CIN 150 and AN 307 (arts and social science)
Culture, science and technology: AN 102 or AN 300 and HST 210 (social science and Western civilization)
Ethnic literature and history of African-Americans: ENG 112 and HST 292 (literature and Western civilization)
European history and literature: HST 101 or 102 and ENG 241, HST 101 and LIT 181, HST 102 and LIT 182 (Western civilization and literature)
Language and civilization: SPN 114, RUS 114, GRM 114, CHE 114, JPN 114 or HIU 114 and the corresponding IS course (250, 260, 260, 210, 220 or 240) (language and international studies)
Macro-economics in the context of American history: HST 115 and ECN 200 (or 210) (Western civilization and social science)
Russian civilization and its Communist transformation: IS 260 and PS 377 (international studies and Western civilization)
Self and society in American history: HST 114 or 115 and SOC 206 (Western civilization and social science)
Theatre and dramatic expression: THA 100 or 301 or 302 and ENG 306 (arts and literature)

Oakland University also requires that students take at least one course that satisfies the ethnic diversity requirement (see *Academic Policies and Procedures* section of this catalog). A listing of such courses is also available in the advising office (159A Dodge Hall). Students may select a course that fulfills both a general education category requirement and the ethnic diversity requirement.

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 in mathematics.

Engineering majors — First semester: EGR 101, MTH 154, CHM 143, CSE 131, rhetoric or general education course. Second semester: CSE 171, MTH 155, PHY 151, general education course.

Computer science majors — First semester: CSE 131, MTH 154, rhetoric, general education course. Second semester: CSE 171, 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 meet the requirements for admission to major standing promptly. For sample schedules, refer to the department listings in this catalog or to the student handbook of the School of Engineering and Computer Science.

Students who are not prepared to enter the mathematics and science courses without additional preparation in these subject areas must modify their schedules accordingly. Such students may require additional time to complete degree requirements, unless they make up the deficiencies by enrolling during the spring and summer sessions following the freshman year.

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 students complete all requirements for major standing.

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 department. The purpose of this process is to ensure that students can correct and are working to correct outstanding deficiencies preventing admission to major standing. Forms may be obtained in the advising office (159A Dodge Hall).

To gain major standing requires writing proficiency and satisfactory completion of course work in mathematics, science and the major, as designated below.

Computer science and computer engineering

Mathematics: MTH 154-155, 256; APM 263. Science: PHY 151, 152. Major: EGR 101 (for computer engineering majors only), CSE 131, 171, 231.

Electrical engineering and systems engineering

Mathematics: MTH 154-155, 256; APM 257. Science: CHM 143, PHY 151, 152. Major: EGR 101; CSE 131, 171; EE 222; ME 221.

Mechanical engineering

Mathematics: MTH 154-155 and either MTH 254 or both MTH 256 and APM 257. Science: CHM 143; PHY 151, 152. Major: EGR 101; CSE 131, 171; ME 221; EE 222.

Engineering physics

Mathematics: MTH 154-155, 254. Science: CHM 143; PHY 151, 152, 158. Major: CSE 131, 171; EE 222.

Engineering chemistry

Mathematics: MTH 154-155, 254, APM 257. Science: CHM 157-158 or 164-165; 147-148. Major: EGR 101; CSE 131, 171; ME 221.

To complete the requirements for major standing satisfactorily 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.

Course load

Students should strike a balance between course load and other commitments. In general, students carrying a full load of 16 credits per semester should not be employed for more than 10 to 20 hours per week. Students who are employed 40 hours per week generally should not carry a course load of more than 4 credits per semester.

The university's maximum course load policy is detailed in the *Academic Policies and Procedures* section (see *Course and credit system*).

Graduation check

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

Cooperative education

General information

Students in the School of Engineering and Computer Science who want to combine relevant work experience with their college education are encouraged to participate in the university's cooperative education program. Co-op employment provides practical training 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 increasing responsibility as students advance through the curriculum.

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 (366 Vandenberg Hall, 370-3213).

To be admitted, students must:

1. Be granted major standing in engineering or computer science (see above), or file an approved plan for achieving major standing, signed by the chair of the major department. 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 academic adviser, 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.

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 university's requirements (see *Additional undergraduate degrees and majors*).

Policies on Electives

Approved science electives

Approved science electives for majors in computer science and in computer, electrical, mechanical and systems engineering are: biology courses numbered 111, 113 and higher; CHM 158 (143 for computer science majors) and chemistry courses numbered 234 and higher, except CHM 497; physics courses numbered 317 and higher, except PHY 341; and ENV 308 and 373. Special topics and independent study courses require prior approval.

Where as any one of the above courses may be taken to satisfy the science elective, some subjects have a greater relevance and usefulness than others to a specific major. Such subjects have been identified for each major, under departmental listings, later on in this catalog. It is highly recommended that students take one of the recommended science elective courses listed under the departmental requirements.

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 143 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 011, 012, 100, 118, 121-122, 141; PHY 101, 102; CHM 101, 104 and 300.

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.

Minors and Concentrations

Students who wish to add a 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 *Other Academic Options* in the Arts and Sciences portion of the catalog).

Accounting

Coordinator: *Eileen Peacock*

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

Applied mathematics

Coordinator: *Jerrold W. Grossman*

For engineering and computer science majors, a minimum of 22 credits. To obtain a minor in applied mathematics, students must complete the following courses with a grade of 2.0 or

better in each: MTH 254, 256, 302, either 351 or 475; STA 226 (or another statistics course approved by the coordinator); and one course chosen from among APM 257, 263, or any 3- or 4-credit 300-400 level courses labeled MTH, APM, MOR or STA, except APM 407 and MTH 497. Students should consult an adviser in the Department of Mathematical Sciences when planning their programs.

Applied statistics

Coordinator: *Robert H. Kushler*

For engineering and computer science majors, a minimum of 16 credits. To obtain a concentration in applied statistics, students 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, 323 and 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, a minimum of 20 credits. To obtain a liberal arts minor in biology, students must take a minimum of 20 credits in biology, including BIO 111, 113 and 116. At least 8 credits must be in courses numbered 301 or higher. A minimum of 8 credits must be taken at Oakland University.

Chemistry

Coordinator: *Michael D. Sevilla*

For computer science majors, a minimum of 26 credits. To obtain a liberal arts minor in chemistry, students must take CHM 157-158, 234-235, 325 and 342. This minor is also available for engineering majors, requiring a minimum of 24 credits. Engineering majors must complete the following courses with an average grade of 2.0 or better: CHM157-158 (or 167-168), 325, 342, 470 and 471. A minimum of 8 credits must be taken at Oakland University.

Economics

Coordinator: *Kevin J. Murphy*

For engineering and computer science majors, a minimum of 18-20 credits. To obtain a minor in economics (offered by the School of Business Administration), students must complete the following courses with a grade of at least 2.0 in each course: ECN 150 or 210 or 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, a minimum of 24 credits. To obtain a concentration in environmental studies, students must complete the following courses: a) CHM 234, ENV 308 and ME 407; b) 8 credits of electives chosen from ENV 372, 373 and BIO 301; and c) 4 credits of ME 490 or 494 on an approved environmental engineering topic.

Finance

Coordinator: *Edward J. Farragher*

For computer science majors, a minimum of 22 credits. To obtain a minor in finance, students 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.

General business

Coordinator: *Kevin Nathan*

For engineering and computer science majors, a minimum of 19-23 credits. To obtain a minor in general business, students must complete the following courses with a grade of at least 2.0 in each course: ECN 210 or both ECN 200 (or 150) and 201, ACC 200, ORG 330, and 6-8 additional credits chosen from 300- or 400-level courses in ACC, FIN, MGT, MIS, MKT, ORG, POM or QMM for which students have met the prerequisites.

International orientation for engineering/computer science students

Coordinator: *Bhushan L. Bhatt*

In view of the ever-increasing globalization of industry, students in engineering and computer science need to be aware of their international opportunities and also to develop an intellectual background that enhances their ability to respond to professional challenges in the global environment.

To obtain a minor in international orientation for engineering/computer science students, students must complete the following courses with a grade of at least 2.0 in each course:

Introductory course (4 credits): IS 210, 220, 230, 240, 250, 260; HST 102, 341

Foreign language consistent with the introductory course (8 credits)

ECN 200 or 210 (4-6 credits)

One advanced course (4 credits) from PS 314 or ECN 373

EGR 496 (4 credits), which requires eight weeks of study/work abroad.

Some of the courses listed above also satisfy general education requirements.

This minor does not satisfy the approved minor requirements for the computer science program.

Linguistics

Coordinator: *Peter J. Binkert*

For computer science majors, a minimum of 20 credits. To obtain a liberal arts minor in linguistics, students must complete the following courses with an average grade of at least 2.0: LIN 201 and 380, and at least 12 linguistics (LIN) credits at the 300 or 400 levels, 4 of which must be at the 400 level.

Management information systems

Coordinator: *Kieran Mathieson*

The minor in management information systems consists of the following 19 credits and any prerequisites for these courses: CSE 125, 130 or 131 or 220; MIS 300, 304 and 316.

Physics

Coordinator: *Ken Elder*

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

Production and operations management

Coordinator: *T.J. Wharton*

The minor in production and operations management consists of a minimum of 20 credits, described as follows, and any prerequisites for these courses: CSE 125 or 130 or 131; QMM 250 or STA 226; POM 343; and any two courses chosen from POM 441, 445, 448, 480 and QMM 452.

Quantitative methods

Coordinator: *David P. Doane*

For computer science majors, a minimum of 19 credits. To obtain a minor in quantitative methods, students must complete the following courses with a grade of at least 2.0 in each course: CSE 130 or 131; QMM 250 or STA 226; three courses chosen from ECN 405, MIS 444, POM 448, QMM 440 or 452, STA 323 and 324.

Additional Information

Prerequisite courses

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.

Project and independent study courses

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

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

Petitions

Waivers of specific academic requirements may be initiated by submitting a petition of exception (see *Petition of exception*).

Students seeking a review of their academic standing within the school or students who wish to make a formal complaint should submit a written petition to the chair of their major department or to the associate dean. Petitions will be processed according to established university procedures.

Academic conduct

Students are expected to abide by the principles of truth and honesty, which are essential to fair grading. Academic misconduct in any form is not permitted.

Students who are found guilty of academic misconduct as determined by the university Academic Conduct Committee, in any course offered by the school, may be subject to penalties, among which are a reduced grade for the assignment, a grade of 0.0 for the entire course, academic probation, or suspension or dismissal from the university.

All assignments must be the independent work of each student, unless the professor of the course gives explicit permission relaxing this requirement.

See the *Academic Conduct Policy* section of the catalog for more detailed information.

Academic standing

The performance of students in the School of Engineering and Computer Science will be reviewed at the end of each semester to determine academic progress.

Good academic standing in the school requires a cumulative grade point average of at least 2.00 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 department. Students who fail to remove provisional conditions after one semester are generally ineligible to continue their programs. However, provisional status may be continued if students are judged to be making substantial progress toward correcting the deficiency. (For part-time students, 12 consecutive credits of 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 subject to their requirements.

The above rules were established by the undergraduate curriculum committee of the School of Engineering and Computer Science. Students wishing to appeal a ruling on their academic status must address a written petition to the School's committee on academic standing. Petitions may be submitted to the academic adviser or the associate dean.

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.

See *Repeating courses* for additional information.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

168 DODGE HALL (248) 370-2200

Chairperson: *Subramaniam Ganesan*

Professor emeritus: *Glenn A. Jackson*

Professors: *David E. Boddy, Subramaniam Ganesan, Richard E. Haskell, Janusz W. Laski, Sarma R. Vishnubhotla, Thomas G. Windeknecht*

Associate professors: *Frank A. Cioch, Fatma Mili, Ronald J. Srodawa, Christian C. Wagner*

Assistant professor: *Gautam Singh*

Special instructor: *Jerry E. Marsh*

Visiting instructor: *Craig Ashley*

Adjunct professor: *Osman D. Altan*

Adjunct associate professors: *Gerard Jozwiak, Ken Rao*

Adjunct assistant professor: *Emad Looka*

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 degree of Bachelor of Science in Engineering with a major in computer engineering, students must complete a minimum of 128 credits. They must demonstrate proficiency in writing (see *Undergraduate degree requirements*) 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 143	General Chemistry	4

PHY 151-152	Introductory Physics	8
Approved science elective*		4
		34

Computer science and engineering core

CSE 131	Computing I	4
CSE 171	Introduction to Digital Logic and Microprocessors	4
CSE 231	Computing II	4
CSE 261	Design and Analysis of Algorithms	4
CSE 378	Design of Digital Systems	4
		20

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 464	Computer Organization and Architecture	4
Senior design course		
CSE 470	Microprocessor-based System Design	
or		
CSE 490	Senior Project**	4
		12

Electives — 8 credits chosen from:

CSE 343	Theory of Computation (4)
Any 400-level CSE course (4-8)	
EE 426	Advanced Electronics (4)
EE 428	Industrial Electronics (4)
EE 437	Introduction to Communication Electronics (4)
SYS 422	Robotic Systems (4)
SYS 431	Automatic Control Systems (4)
SYS 463	Foundations of Computer-Aided Design (4)
SYS 469	Simulation in Engineering (4)
CSE 490***	Senior Project (2-4)
CSE 494***	Independent Study (2-4)
	8

Free electives (may be used to satisfy writing proficiency) 6
For limitations on free electives see *Policies on electives*.

Total 128

*Approved science electives are given in Policies on electives. *Those most highly recommended for computer engineering students are CHM 158, and any PHY course numbered 325 or higher (except PHY 341).*

***Needs approval for its design content by the chairperson of the Department of Computer Science and Engineering.*

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

Design requirements

All computer engineering students must complete a total of at least 16 credit hours of design while satisfying their overall program requirements. In meeting this requirement, they must seek their faculty adviser's approval. Also, consult the SECS "Undergraduate Student Handbook" for a listing of the number of design credit hours contained in each course.

Economics requirement

In addition to the requirements stated above, computer engineering students must fulfill the economics requirement. This may be met by completion of ECN 150, 200 or 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 2.00 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 143, CSE 131, rhetoric 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: APM 263, PHY 152, CSE 231, general education, 1-credit free elective, 17 credits; winter semester: MTH 256, EE 222, CSE 261, general education, 15 credits.

Junior year — fall semester: APM 257, ME 221, SYS 317, EE 326, general education, 18 credits; winter semester: ME 241, CSE 378, SYS 325, general education, 15 credits.

Senior year — fall semester: EE 384, CSE 470 or 490, professional elective, science elective, EGR 401, 17 credits; winter semester: CSE 464, professional elective, 4-credit free elective, 12 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 a minimum of 128 credits, demonstrate writing proficiency (see *Undergraduate degree requirements*) 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 131	Computing I	4
CSE 171	Introduction to Digital Logic and Microprocessors	4
CSE 231	Computing II	4
CSE 261	Design and Analysis of Algorithms	4
CSE 378	Design of Digital Systems	4
		20
Professional subjects		
Required:		
CSE 335	Programming Languages	4
CSE 343	Theory of Computation	4
CSE 402	Social Implications of Computing	1
CSE 450	Operating Systems	4
		13
Electives — 12 credits chosen from:		
At least one of the following software design oriented courses: CSE 413, 414, 415, 416, 437, 438, 439, 440, 445, 447, 455, 465 (4-12)		
Any 300- or 400-level CSE course (4-8)		
SYS 463	Foundations of Computer-Aided Design (4)	
SYS 469	Simulation in Engineering (4)	
CSE 490**	Senior Project (2-4)	
CSE 494**	Independent Study (2-4)	
		12
Approved minor		20
Free electives (may be used to satisfy writing proficiency)		6
For limitations on free electives see *Policies on electives*.		
	Total	128

Approved science electives are given in Policies on electives. *Those most highly recommended for computer science students are CHM 143, and any PHY course numbered 325 or higher.*

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

Computer science categories requirements

Each student must attain depth of coverage in at least three of the following five areas in the advanced elective courses of the Computer Science curriculum: algorithms, data structures, software design, programming concepts and computer architecture. Depth of coverage is assured by an accumulation of a minimum of four credits in a given area. In addition, every student must accumulate at least two credit hours in each of the above five areas by taking appropriate courses numbered 300 and above. For details, consult the SECS Undergraduate Student Handbook.

Performance requirements

In addition to previously stated requirements, satisfactory completion of the program requires an average grade of at least 2.00 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, general business, linguistics, physics and quantitative methods (see *Concentrations and minors*, above).

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 131, general education, English composition or general education, 16 credits; winter semester: MTH 155, PHY 151, CSE 171, general education, 16 credits.

Sophomore year — fall semester: APM 263, PHY 152, PHY 158, CSE 231, general education, 18 credits; winter semester: MTH 256, CSE 261, course in minor, general education, 15 credits.

Junior year — fall semester: STA 226, CSE 335, course in minor, general education, 16 credits; winter semester: CSE 343, 378, course in minor, general education or free elective, 16 credits.

Senior year — fall semester: CSE 402, 450, professional elective, course in minor, science elective, 17 credits; winter semester: two professional electives, course in minor, free elective, 14 credits.

Minors in computer science or computing for nonengineering majors

The School of Engineering and Computer Science offers two minors, one in computer science and the other in computing, to students with majors other than engineering or computer science.

The minor in computer science is suitable for students with a major in mathematics, physics, chemistry or biology, who may wish to emphasize numerical, scientific and engineering aspects of computing. Students must earn a minimum of 20 credits, including the following courses: CSE 131, 171, 231, 261 or 378, any CSE course numbered 300 or above. At least 12 of these credits must be taken at Oakland University. A grade of 2.0 is required in each course for this minor.

The minor in computing is suitable for students with a major in liberal arts or business, who may wish to emphasize non-numerical and symbolic data processing aspects of computing. Students must earn a minimum of 20 credits as follows: 8 credits from CSE 125, and 130 or 131; 12 credits from CSE 220, CSE courses numbered 232 through 245, CSE 340 and 345. At least 12 of these credits must be taken at Oakland University. An average grade of at least 2.0 is required in courses counted toward this minor.

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

Secondary teaching minor in computer science

The secondary teaching minor in computer science requires completion of 28 credits, of which 20 must be as follows: CSE 125, 171, 131, 231, and any other 4-credit CSE courses numbered 261 or higher. At least 12 of these credits must be taken at Oakland University. In addition, 8 credits must be completed in appropriate courses offered by the School of Education and Human Services; students should consult the secondary education program coordinator (514 O'Dowd, 370-3093) for selection of these courses. A grade of at least 2.0 is required for each CSE course taken toward this minor. Permission of the Department of Computer Science and Engineering is required for registration in any 300- or 400-level CSE course.

DEPARTMENT OF ELECTRICAL AND SYSTEMS ENGINEERING

102A SCIENCE AND ENGINEERING BUILDING (248) 370-2177

Chairperson: *Naim A. Kheir*

Professors emeriti: *David H. Evans, Howard R. Witt*

Professors: *Ka C. Cheok, Naim A. Kheir, Keith R. Kleckner, Michael P. Polis, Andrzej Rusek, Tung H. Weng, Mohamed A. Zohdy*

Associate professors: *Hoda S. Abdel-Aty-Zohdy, Manohar Das, Edward Y. L. Gu, Sankar Sengupta, Robert P. Van Til*

Assistant professor: *Patrick Dessert*

Adjunct professors: *Ronald R. Beck, Robert F. Bordley, Donald R. Falkenburg*

Adjunct associate professors: *Francis B. Hoogterp, Mutasim Salman*

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 for challenging careers in electrical engineering in the coming decades. The curriculum offers strong fundamentals in analog and digital circuits, electronics including VLSI systems, electromagnetics, electronic devices, communications, controls and power systems. In addition, a strong laboratory component of the program offers numerous design opportunities and allows students to relate theoretical ideas to practical problems using modern equipment and hardware/software tools.

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 degree of Bachelor of Science in Engineering with a major in electrical engineering, students must complete a minimum of 128 credits, demonstrate writing proficiency (see *Undergraduate degree requirements*) 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 143	General Chemistry	4
PHY 151-152	Introductory Physics	8
Approved science elective*		4
		34

Engineering core		
EGR 101	Introduction to Engineering **or**	1
EE 101	Introduction to Electrical and Systems Engineering	1 + 1**
EGR 401	Professional Engineering	1
CSE 131	Computing I	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	3
EE 351	Electromechanical Energy Conversion	3
EE 378	Design of Digital Systems	4
EE 437	Introduction to Communication Electronics	4
EE 491	Senior Design	4
SYS 431	Automatic Control Systems	4
		26
Electives — 8 credits chosen from:		
Any 400 level courses with an EE or SYS designation		
EE 490***	Senior Project (2-4)	
EE 494***	Independent Study (2-4)	
		8
Free electives (may be used to satisfy writing proficiency)		4
For limitations on free electives, see *Policies on electives*.		
	Total	128

* *Approved science electives are given in* Policies on electives. *Those most highly recommended for electrical engineering students are PHY 331, 361 and 371.*

** *This additional credit will count toward free elective.*

*** *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 packages: Electronics — EE 426 and either EE 485 or 487; Control systems — SYS 422, 433; Computers — EE 470, 472; Power systems — SYS 458, ME 454.

Design requirements

All electrical engineering students must complete a total of at least 16 credit hours of design while satisfying their overall program requirements. In meeting this requirement, they must seek their faculty adviser's approval. The SECS "Undergraduate Student Handbook" lists the number of design credit hours contained in each course.

Economics requirement

In addition to the requirements stated above, electrical engineering students must fulfill the economics requirement. This may be met 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 2.00 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, 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 students for careers in simulation, computer-assisted design and systems optimization.

To earn the degree of Bachelor of Science in Engineering with a major in systems engineering, students must complete a minimum of 128 credits, demonstrate writing proficiency (see *Undergraduate degree requirements*) 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 143	General Chemistry	4
PHY 151-152	Introduction to Physics	8
Approved science elective**		4
		34
Engineering core		
EGR 101	Introduction to Engineering **or**	1
SYS 101	Introduction to Electrical and System Engineering	1 + 1***
EGR 401	Professional Engineering	1
CSE 131	Computing I	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 372	Properties of Materials	4
SYS 317	Engineering Probability and Statistics	3
SYS 325	Lumped Parameter Linear Systems	3
		32

Professional subjects for dynamic systems and control option (34 credits)
Required:

EE 326	Electronic Circuit Design	4
EE 351	Electromechanical Energy Conversion	3
EE 378	Design of Digital Systems	4
ME 321	Dynamics and Vibrations	3
SYS 431	Automatic Control Systems	4
SYS 433	Modern Control System Design	4
SYS 491	Senior Design	4
		26

Electives — 8 credits chosen from:
Any 400-level courses with EE or SYS designation

SYS 490*†	Senior Project (2-4)	
SYS 494*†	Independent Study (2-4)	
		8

Professional subjects for manufacturing option (32 credits)
Required:

SYS 422	Robotic Systems	4
SYS 483	Production Systems	4
SYS 484	Flexible Manufacturing Systems	4
SYS 485	Statistical Quality Control	4
SYS 491	Senior Design	4
ME 474	Manufacturing Processes	4
		24

Electives — 8 credits chosen from:
Any 400-level courses with the SYS, EE or ME designation

CSE 412	Artificial Intelligence in Manufacturing (4)	
SYS 490*†	Senior Project (2-4)	
SYS 494*†	Independent Study (2-4)	
		8

Free Electives (may be used to satisfy writing proficiency) 4-6
For limitations on free electives see *Policies on electives*.

Total 128

**MTH 254 is required for dynamic systems and control option and APM 263 is required for manufacturing option.*

***Approved science electives are given in* Policies on electives. *Those most highly recommended are PHY 331 and 371.*

****This additional credit will count toward free elective.*

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

Economics requirement

In addition to the requirements stated above, systems engineering students must fulfill the economics requirement. This may be met by completion of ECN 150, 200 or 210 as part of the general education requirement.

General business

Students enrolled in the manufacturing option may wish to augment their degree with a minor in general business. This may be done by completing 19-23 credits specified by the School of Business Administration (see *Minors* in the Business Administration portion of the catalog). Credits from the minor may be used to satisfy the social science general education requirement, the economics requirement, and the free elective requirement.

Design requirements

All systems engineering students must complete a total of at least 16 credit hours of design while satisfying their overall program requirements. In meeting this requirement, they must seek their faculty adviser's approval. The SECS "Undergraduate Student Handbook" lists the number of design credit hours contained in each course.

Performance requirements

In addition to previously stated requirements, satisfactory completion of the program requires an average grade of at least 2.00 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 or EE 101 or SYS 101, MTH 154, CHM 143, CSE 131, rhetoric or general education, 17 or 18 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 241, general education, 16 credits; winter semester: APM 257, EE 222, ME 221 or 241, general education, 1-credit free elective, 16 credits.

Junior year — fall semester: MTH 256, SYS 317 or EE 384, ME 372 (for SYS majors), EE 326 (for EE majors), SYS 325, general education, 17 or 18 credits; winter semester: two professional subjects, one science elective, one free elective, 16 credits.

Senior year — fall semester: EE 384 or SYS 317 and two professional subjects (for EE majors), three professional subjects (for SYS majors), EGR 401, general education, 16 or 17 credits; winter semester: EE491 or SYS 491, two professional subjects, 12 credits.

DEPARTMENT OF MECHANICAL ENGINEERING

170 DODGE HALL (248) 370-2210

Chairperson: *Joseph D. Hovanesian*

Professors: *Bhushan L. Bhatt, Robert H. Edgerton, Joseph D. Hovanesian, Michael Y.Y. Hung, Gilbert L. Wedekind*

Associate professors: *Gary C. Barber, Ren-Jyh Gu, Ching L. Ko, Michael A. Latcha, Brian P. Sangeorzan*

Assistant professors: *Keyu Li, Suresh C. Ramalingam*

Adjunct professors: *Francis H.K. Chen, Grant R. Gerhart, Raghunath Khetan*

Adjunct associate professors: *Daniel C. Haworth, Ranjit K. Roy, Simon C.Y. Tsang*

Major in Mechanical Engineering

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

Oakland University's mechanical engineering program provides the student with a foundation in the fundamental concepts and principles associated with mechanics of solids, thermodynamics, fluid mechanics, heat transfer, fluid and thermal energy systems, materials, manufacturing, design of mechanical systems, electrical circuits, computer programming and software utilization. A strong laboratory experience and the utilization of instrumentation and computers is interwoven through the curriculum. The program also provides numerous engineering design experiences.

Students majoring in mechanical engineering will select an option, providing for selection among senior-level courses in one of four areas: either the general mechanical engineering option or the more specialized options of fluid and thermal systems, computer-aided design, or manufacturing engineering.

The Mechanical Engineering curriculum including the first three options is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). In addition, the Manufacturing Engineering option in Mechanical Engineering, which focuses on application of mechanical engineering principles in materials and manufacturing processes, product engineering, and the design of manufacturing systems, has also been accredited by ABET.

To earn the degree of Bachelor of Science in Engineering with a major in mechanical engineering, students must complete a minimum of 128 credits, demonstrate writing proficiency (see *Undergraduate degree requirements*) 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 143	General Chemistry (or CHM 164)	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 131	Computing I	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 372	Properties of Materials	4
SYS 317	Engineering Probability and Statistics	3
SYS 325	Lumped Parameter Linear Systems	3
		32

Professional subjects
Required:

ME 321	Dynamics and Vibrations	3
ME 331	Introduction to Fluid and Thermal Energy Transport	4
ME 361	Mechanics of Materials	4
		11

Professional design requirements

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

Group A

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

Also choose at least three credits from, Senior Mechanical Engineering Design Project, ME 492, or Senior Project, ME 490. Credits from ME 492 and ME 490 should belong to, and be counted toward, one of the professional options listed below. Students who elect the Manufacturing Engineering option are required to select ME 493.

Students who elect the Fluid and Thermal Systems option are advised to satisfy Group B requirements with ME 482.

Professional options

1. **General mechanical engineering option** (15 credits)
   Professional electives (chosen from the following if not taken to satisfy Group A and B design requirements)

ME 423	Acoustics and Noise Control (4)
ME 438	Fluid Transport (4)
ME 448	Thermal Energy Transport (4)
ME 449	Numerical Techniques in Heat Transfer and Fluid Flow (4)
ME 450	Computer-Aided Data Acquisition Analysis and Control (2)
ME 454	Solar and Alternate Energy Systems (4)
ME 456	Energy Systems Analysis (4)

ME 457	Internal Combustion Engines I (4)
ME 461	Analysis and Design of Mechanical Structures (4)
ME 472	Material Properties and Processes (4)
ME 474	Manufacturing Processes (4)
ME 475	Lubrication, Friction and Wear (4)
ME 482	Fluid and Thermal Energy Systems (4)
ME 486	Machine Design (4)
ME 487	Mechanical Engineering CAD/CAM Systems (4)
ME 490**	Senior Project (2-4)
ME 492	Senior Mechanical Engineering Design Project (3)

Not more than 4 credits from:

ME 407	Environmental Engineering (4)
ME 477	Concurrent Engineering (4)
ME 484	Automotive Engineering Design I (4)
ME 494**	Independent Study (2-4)
SYS 431	Automatic Control Systems (4)
SYS 469	Computer Simulation in Engineering (4)
SYS 483	Production Systems (4)
SYS 484	Flexible Manufacturing Systems (4)

15

2. **Fluid and thermal systems option** (15 credits)

Required subjects

ME 438	Fluid Transport (4)
ME 448	Thermal Energy Transport (4)
ME 482	Fluid and Thermal Energy Systems (4)

Professional electives (chosen from the following if not taken to satisfy Group A and B design requirements)

ME 423	Acoustics and Noise Control (4)
ME 449	Numerical Techniques in Heat Transfer and Fluid Flow (4)
ME 450	Computer-Aided Data Acquisition Analysis and Control (2)
ME 454	Solar and Alternate Energy Systems (4)
ME 456	Energy Systems Analysis (4)
ME 457	Internal Combustion Engines I (4)
ME 492	Senior Mechanical Engineering Design Project (3)
ME 490**	Senior Project (2-4)

No more than 4 credits from:

ME 494**	Independent Study (2-4)
SYS 431	Automatic Control Systems (4)

15

3. **Computer-aided design option** (15 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 Group A and B 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)
ME 492	Senior Mechanical Engineering Design Project (3)
ME 490**	Senior Project (2-4)
ME 494**	Independent Study (2-4)

No more than 4 credits from:

SYS 431	Automatic Control Systems (4)	
SYS 463	Foundations of Computer-Aided Design (4)	
		15

4. **Manufacturing Engineering option** (15 credits)

Students selecting this option must complete a required form **before** taking courses for this option, and they should have completed the engineering core and professional subjects requirements of the mechanical engineering curriculum.

Required subjects

ME 474	Manufacturing Processes (4)	
SYS 484	Flexible Manufacturing Systems (4)	
ME 467	Optical Measurement and Quality Inspection (4)	
or SYS 485	Statistical Quality Control (4)	
ME 493	Senior Manufacturing Engineering Design Project (3)	

Suggested professional electives. Students are urged to consider selecting one of the following courses to satisfy their free electives requirement:

ME 461	Analysis and Design of Mechanical Structures (4)	
ME 467	Optical Measurement and Quality Inspection (4)	
ME 472	Material Properties and Processes (4)	
ME 475	Lubrication, Friction and Wear (4)	
ME 476	Product and Process Development (4)	
ME 477	Concurrent Engineering (4)	
ME 482	Fluid and Thermal Energy Systems (4)	
ME 486	Machine Design (4)	
ME 487	Mechanical Engineering CAD/CAM Systems (4)	
SYS 422	Robotic Systems (4)	
SYS 431	Automatic Control (4)	
SYS 469	Computer Simulation in Engineering (4)	
SYS 483	Production Systems (4)	
SYS 485	Statistical Quality Control (4)	
ME 490**	Senior Project (2-4)	
ME 494**	Independent Study (2-4)	
		15

Free electives (may be used to satisfy writing proficiency and programming recommendations) 4

For limitations on free electives see *Policies on electives*.

Total 128

**Approved science electives are given in* Policies on electives. *Those most highly recommended for mechanical engineering students are PHY 331, 351, 366, 371; CHM 158; BIO 111 and 205.*

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

Design requirements

Design credits must be associated with courses in the professional option, chosen with approval of a faculty adviser. All mechanical engineering students must complete a total of at least 16 credit hours of design while satisfying their overall program requirements. Consult the SECS "Undergraduate Student Handbook" for a listing of the number of design credit hours contained in each course.

Economics requirement

In addition to the requirements stated above, mechanical engineering students must fulfill the economics requirement. This may be met by completion of ECN 150, 200 or 210 as part of the general education requirement.

Recommended computer experience

In addition to the required computer courses, it is recommended that students have some experience in computer-aided drawing, such as ME 208; 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 2.00 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 143, CSE 131, rhetoric or general education, 17 credits; winter semester: MTH 155, PHY 151, CSE 171, general education, 16 credits.

Sophomore year — fall semester: MTH 254, PHY 152, ME 221 or 241, general education, 16 credits; winter semester: APM 257, EE 222, ME 221 or 241, general education, 15 credits.

Junior year — fall semester: MTH 256, ME 321 and 331, SYS 325, general education, 17 credits; winter semester: ME 361, 372, free or professional elective, science elective, 16 credits.

Senior year — fall semester: SYS 317, EGR 401, ME 492 or 493 or 490, professional subject, general education, 15 credits; winter semester: four professional subjects, 16 credits.

ENGINEERING SCIENCES PROGRAMS

Major in Engineering Chemistry

Coordinators: *Ching L. Ko (engineering), Julien Gendell (chemistry)*

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 degree of Bachelor of Science with a major in engineering chemistry, students must complete a minimum of 128 credits, demonstrate writing proficiency (see *Undergraduate degree requirements*) 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 157-158	General Chemistry (or CHM 167-168)	10
CHM 234-235	Organic Chemistry	8
CHM 237	Organic Chemistry Laboratory I	2
CHM 325	Anatytical Chemistry	4
CHM 342-343	Physical Chemistry	8
CHM 348	Physical Chemistry Laboratory	2
CHM 471	Macromolecular Chemistry	3
Plus one lecture or laboratory course (two or three credits) above CHM 400		2 (3)
		39(40)
Engineering		
EGR 101	Introduction to Engineering	1
EGR 401	Professional Engineering	1
CSE 131	Computing I	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)
For limitations on free electives see *Policies on electives*. 5 (4)

Total 128

Performance requirements

In addition to the previously stated requirements, satisfactory completion of the program requires an average grade of at least 2.00 in the courses taken to satisfy the engineering, chemistry, and mathematics and physics requirements.

Major in Engineering Physics

Coordinators: *Hoda Abdel-Aty-Zohdy (engineering), Andrei Slavin (physics)*

The program in engineering physics is offered jointly by the School of Engineering and Computer Science and the College of Arts and Sciences. This program blends the pure and applied, the theoretical and practical aspects of scientific knowledge into a meaningful educational experience. Through the university's cooperative education program, engineering physics students may opt to combine a relevant work experience with their formal education.

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

		Credits
General education (excluding mathematics and science)		24
Mathematics and sciences		
MTH 154-155	Calculus	8
MTH 254	Multivariable Calculus	4
APM 257	Introduction to Differential Equations	3
CHM 143	General Chemistry	4
PHY 151-152	Introductory Physics	8
PHY 158	Physics Laboratory	2
PHY 317	Modern Physics Laboratory	2
PHY 351	Intermediate Theoretical Physics	4
PHY 361	Mechanics I	4
PHY 371	Modern Physics	4
Another course in physics in addition to any required in options below, chosen from:		
PHY 331	Optics (4)	
PHY 366	Vibrations and Waves (4)	
PHY 381	Electricity and Magnetism I (4)	
PHY 472	Quantum Mechanics I (4)	4
		47
Engineering		
CSE 131	Computing I	4
CSE 171	Introduction to Digital Logic and Microprocessors	4
EE 222	Introduction to Electrical Circuits	4
EE 326	Electronic Circuit Design	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
		30

Professional option

(The following two options are offered as typical. Students with different interests can construct different options in consultation with the program coordinators.)

Solid state physics and technology option

EE 384	Electronic Materials and Devices	4
PHY 472	Quantum Mechanics I	4
Design elective, chosen from:		4
EE 378	Design of Digital Systems (4)	
EE 426	Advanced Electronics (4)	
EE 437	Introduction to Communication Electronics (4)	
EE 470	Microprocessors and Microcomputers (4)	
EE 487	Integrated Electronics (4)	
SYS 410	Systems Optimization and Design (4)	
		12

Applied mechanics option

PHY 366	Vibrations and Waves	4
ME 361	Mechanics of Materials	4
Design elective, chosen from:		4
ME 454	Solar and Alternate Energy Systems (4)	
ME 461	Analysis and Design of Mechanical Structures (4)	
ME 482	Fluid and Thermal Energy Systems (4)	
ME 486	Machine Design (4)	
ME 487	Mechanical Engineering CAD/CAM Systems (4)	
		12

Technical electives, chosen from:

MTH 256	Introduction to Linear Algebra (3)
APM 263	Discrete Mathematics (4)
PHY 318	Nuclear Physics Laboratory (2)
PHY 331	Optics (4)
PHY 366	Vibrations and Waves (4)
PHY 372	Nuclear Physics (4)
PHY 381	Electricity and Magnetism I (4) or
EE 345	Electric and Magnetic Fields (3)
PHY 418	Modern Optics Laboratory (2)
PHY 472	Quantum Mechanics I (4)
PHY 482	Electricity and Magnetics II (4)
EE 351	Electromechanical Energy Conversion (3)
EE 378	Design of Digital Systems (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 400-level EE, ME or SYS courses (4-8)	
	7-8

Free electives (can be used to satisfy writing proficiency) 7-8

For limitations on free electives, see *Policies on electives*.

Total 128

Performance requirements

In addition to the previously stated requirements, satisfactory completion of the program requires an average grade of at least 2.00 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. For some of the courses, the semester(s) in which they are usually offered is indicated at the end of course description. However, this is subject to change.

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. Offered fall, winter. (Graded S/U)

EGR 295 Special Topics (1 to 4)
Study of special topics in engineering and/or computer science. May be taken more than once. Topic must be approved prior to registration.

EGR 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 taken up to three times. Offered fall, winter.
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. Offered fall.
Prerequisite: Senior status in engineering.

EGR 496 International Engineering and Computer Science (4)
An independent study or technical internship involving a minimum of eight weeks of residence abroad; student is required to present a final report. Departmental approval is required prior to registration.
Prerequisite: Senior standing.

COMPUTER SCIENCE AND ENGINEERING

CSE 125 Introduction to Computer Use (4)
A first course in computer usage for non-engineering and computer science majors. Introduction 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 between lecture and computing laboratory. Offered fall, winter. *Satisfies the university general education requirement in mathematics, logic and computer science.*
Prerequisite: MTH 012 or equivalent.

CSE 130 Introduction to Computer Programming (4)
Introduction to digital computers and algorithmic programming in a language such as C++. Topics include: data storage and manipulation, control structures, functions and subprogramming. Introduction to object oriented programming. Engineering and computer science majors should enroll in CSE 131. Students cannot receive credit for both CSE 130 and 131. Offered fall, winter. *Satisfies the university general education requirement in mathematics, logic and computer science.*
Prerequisite: MTH 012 or equivalent.

CSE 131 Computing I (4)
Introduction to computer programming using a high level programming language such as C++. General methods of problem solving and principles of algorithmic design and object-oriented design. Basic data structures are introduced. Students cannot receive credit for both CSE 130 and 131. Offered fall, winter.
Corequisite: MTH 154.

CSE 171 Introduction to Digital Logic and Microprocessors (4)
Introduction to digital logic using programmable logic devices. Introduction to computer organization and microprocessors. Assembly language programming. Offered fall, winter.
Prerequisite: CSE 131 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 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. Offered fall, winter.
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 231 Computing II (4)
A second course in programming, with emphasis on data abstraction and object-oriented design. The basic data structures in computer science, including stacks, queues, files, lists, trees and graphs, are covered in detail. Concepts of design, analysis and verification are discussed in the context of abstract data types. Examples of applications taken from numeric and symbolic domains are used. Offered fall, winter.
Prerequisite: CSE 131 or equivalent.

CSE 232-245 Programming Language Labs
Prerequisite for each course: Ability to program in one high-level language.
CSE 232 Language Laboratory — FORTRAN (1)
CSE 235 Language Laboratory — PASCAL (1)
CSE 237 Language Laboratory — ADA (1)
CSE 238 Language Laboratory — C++ (1)
Note: students cannot receive credit for both CSE 238 and 130 or 131.
CSE 239 Language Laboratory — Modula-2 (1)
CSE 240 Language Laboratory — LISP (1)
CSE 241 Language Laboratory — FORTH (1)
CSE 244 Language Laboratory — PROLOG (1)
CSE 245 Language Laboratory — SMALLTALK (1)

CSE 261 Design and Analysis of Algorithms (4)
Computer algorithms, their design and analysis. Strategies for constructing algorithmic solutions, including divide-and-conquer, dynamic programming and greedy algorithms. Development of algorithms for parallel and distributed architectures. Computational complexity as it pertains to time and space is used to evaluate the algorithms. A general overview of complexity classes is given. Offered fall, winter.
Prerequisite: CSE 231, APM 263.

CSE 315 Computer Parsing of Natural Language (4)
Identical with LIN 315.
Prerequisite: ALS 176, CSE 130 or 131.

CSE 335 Programming Languages (4)
Fundamental concepts in programming languages. Several high-level languages are studied in depth and their approaches to the fundamental issues in language design are compared. Issues include: data types and structures, control structures, binding times, run-time, storage organization, flexibility vs. efficiency, compiled vs. interpreted languages, strong vs. weak typing, block structure and scope of names. Offered fall, winter.
Prerequisite: CSE 261, MTH 256 and major standing.

CSE 340 File Systems Design (4)
Study of hardware and software characteristics as they pertain to file design. Standard file design techniques are covered with an emphasis on general problem solving approaches. Offered fall.
Prerequisite: CSE 130 or 131, junior standing.

CSE 343 Theory of Computation (4)
Formal models of computation, including finite state automata, pushdown automata and Turing machines. Regular and context-free languages. The computational models are used to discuss computibility issues. Offered fall, winter.
Prerequisite: CSE 261 and major standing.

CSE 345 Database 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. The course will emphasize practical applications of data bases and the solution of problems. Intended for students wishing a minor in computer science; it may not be used for credit toward a degree program in Computer Science and Engineering. Students cannot receive credit for both CSE 345 and CSE 445. Offered winter.
Prerequisite: CSE 130 or 131, junior standing.

CSE 378 Design of Digital Systems (4)
Combinational and sequential logic circuits. Optimal two-level designs. Circuits such as arithmetic units, encoders, decoders, multiplexers, PLAs and FPGAs. Sequential design techniques, flip-flops, state diagrams, excitation tables. Control and instrumentation applications. Data and address buses, registers and data transfer. Introductory architecture design of a small computer. Offered fall, winter.
Prerequisite: CSE 171 and major standing.

CSE 402 Social Implications of Computers (1)
Seminars dealing with the professional, social and ethical issues of computer science and engineering. Presentations by faculty, students and visiting professionals. (Graded S/U). Credit cannot be earned for both CSE 402 and EGR 401. Offered fall.
Prerequisite: Senior standing in the School of Engineering and Computer Science.

CSE 412 Artificial Intelligence in Manufacturing (4)
Integration of the techniques and methodologies from artificial intelligence and manufacturing engineering. On the manufacturing side, issues of design, manufacturability, process planning, and cost analysis are cast around feature-based CAD/CAM technologies. The artificial intelligence techniques include standard transparent representation schemes of rule bases and semantic networks as well as the most up-to-date opaque representations of neural networks and genetic algorithms, both areas integrated with issues of fuzzy logic and control. Involves a large class project in the Artificial Intelligence in Manufacturing (AIM) laboratory. Offered winter.
Prerequisite: CSE 416.

CSE 413 Soft Computing (4)
A study of algorithms that can be used to add humanlike intelligence to computer systems. Topics include fuzzy logic, artificial neural networks, genetic algorithms, and classification and regression trees. Applications to machine learning, pattern recognition, and intelligent automation. Offered fall.
Prerequisite: CSE 261 and major standing.

CSE 415 Expert Systems and Decision Support Systems (4)
Covers foundations, state-of-the-art, theory, and practice of both expert systems and decision support systems. Topics in expert systems include knowledge representation, reasoning under uncertainty, weak methods and role-limited methods, and knowledge acquisition reuse in the context of knowledge acquisition tools and meta-tools. Topics in decision support systems include decision theory and decision models, decision support systems architecture, and organizational and group support systems. Offered winter.
Prerequisite: CSE 335 and 416.

CSE 416 Artificial Intelligence (4)
An introduction to artificial intelligence techniques, including: knowledge representation using semantic networks, scripts, frames, predicate calculus, production and expert systems, and procedures; learning via symbolic and adaptive algorithms; natural language understanding; and game playing and other searching problems. Offered fall.
Prerequisite: CSE 240 or LISP, CSE 335.

CSE 421 Computer Program Construction (4)
Covers a formalism for defining program specifications and for iteratively transforming specifications into correct programs. The course uses the formalism of relational algebra. The relational algebra is covered in class. Offered fall.
Prerequisite: CSE 343.

CSE 437 Systematic Software Development (4)
A project-driven, language-independent, top-down software development method based on specifications and refinement of every step of design. It involves user-defined Abstract Operations and Abstract Data Types. A variant of the Vienna Development Method (VDM) is used. Specifications techniques are introduced gradually, in step with a nontrivial term project. An emphasis is placed on practical applications of the method. Offered winter.
Prerequisite: Fluency in programming and good command of data structures, APM 263 and major standing.

CSE 438 Verification of Computer Programs (4)
Systematic methods of software verification, testing and analysis, and the supporting CASE tools. Topics: principles of formal verification, static program analysis, program dependencies, program slicing, and dynamic program analysis (testing and debugging). A significant part of the course is its lab component. Offered fall.
Prerequisite: CSE 261 or equivalent, major standing, fluency in high level programming language.

CSE 439 Software Engineering (4)
An overview of software development processes, tools, and techniques from the perspective of learning what they can and cannot do; deciding when, how and why to apply them; and selecting among the available alternatives. Requirements analysis and specification techniques, life-cycle models, process modeling, software design methods, project planning and management, quality assurance, configuration management, program and system testing. Offered fall.
Prerequisite: CSE 261 or equivalent, major standing.

CSE 440 Software Quality (4)
Intended for students who have mastered fundamental design and programming skills. The impact of software design and construction techniques on structural quality for both object-oriented and traditional decomposition. The relationship between software structure and software maintainability (modifiability and readability) and reusability is emphasized. Offered winter.
Prerequisite: CSE 261 or equivalent, major standing.

CSE 445 Database Systems (4)
Design and implementation of relational, hierarchical and network database systems. Query/update data languages, conceptual data model, physical storage methods, database system architecture. Database security and integrity. Relational database systems are emphasized. The course has a significant laboratory component involving the use of commercial database software to retrieve information in various forms. Students cannot receive credit for both CSE 345 and CSE 445. Offered fall, winter.
Prerequisite: CSE 261 and major standing.

CSE 447 Computer Communications (4)
A study of data communications and computer networks with emphasis on the functional characteristics of communications hardware and the design of communications control software. Standard protocols and interfaces. Case studies of local area networks and wide area networks. Communications software is designed and implemented as student projects. Offered fall.
Prerequisite: CSE 450 or equivalent.

CSE 450 Operating Systems (4)
Introduction to the concepts and design of multi-programmed operating systems. Typical topics include: historical perspectives; sequential processes; concurrent processes; processor management; memory management; scheduling; file management, resource protection; a case study. Offered fall, winter.
Prerequisite: CSE 261 and major standing.

CSE 455 Computer Graphics I (4)
Introduction to the concepts underlying two- and three-dimensional computer graphics. Topics include an overview of graphics hardware and software, capabilities and algorithms of a two-dimensional raster graphics package, basics of three-dimensional raster graphics, algorithms for simple three-dimensional raster graphics, introduction to computer animation. Offered fall.
Prerequisite: MTH 256, CSE 261 and major standing.

CSE 456 Computer Graphics II (4)
Continuation of CSE 455. Topics covered include realistic rendering techniques (hidden line/surface, lighting, shading, texture mapping); mathematics and data structures for curve, surface, and solid representation (including B-spline and Bezier techniques); advanced animation techniques (key-frame animation, morphing). Offered winter.
Prerequisite: CSE 455 or permission of instructor.

CSE 464 Computer Organization and Architecture (4)
Stored program computers, performance evaluation, RISC and CISC architectures, instruction sets, theory and design of arithmetic-logic and control units, hardwired control design and microprogrammed design, memory organization, cache mapping, associative memory, pipeline computer design, linear and non-linear pipelines, data and branch hazards, stalling, interfacing input/output units with processors, parallel processing. Course emphasizes hardware design and organization. Offered winter.
Prerequisite: CSE 378, APM 263, and major standing.

CSE 465 Compiler Design (4)
A project-oriented course in which the student develops a compiler for a simple language. Formal language and regular grammars, finite-state machines and lexical analysis, context-free grammars and parsing, syntax-directed translation and decorated parse-trees, symbol-table design, quadruples and other intermediate forms, simple optimizations. Offered winter.
Prerequisite: CSE 335 and 343.

CSE 470 Microprocessor-based Systems Design (4)
Application of microprocessors and microcomputers to the solution of typical problems; interfacing microprocessors with external system such as sensors, displays and keyboards; programming considerations, microcomputer system and memory system design. A laboratory, design course; several short design projects and one large design project. Written report and oral presentation required. Credit cannot be earned for both CSE 470 and EE 470. Offered fall, winter.
Prerequisite: CSE 378.

CSE 471 Design of Embedded Software Computer Systems (4)
Design of real-time systems with microcontrollers such as the 68HC11 and 68332. Object-oriented software development using both assembly language and high-level languages. Use of interrupts. Project-oriented course. Offered winter.
Prerequisite: CSE 470 or equivalent.

CSE 478 Switching Theory and Digital Logic (4)
Combinational switching functions, minimization, design, analysis, and decomposition, NAND/NOR realization, relay circuits, programmable logic controllers, symmetric functions, unate functions, threshold logic and design with threshold elements, iterative circuits, completely and incompletely specified sequential circuits and their minimization, pulse mode circuits, Moore and Mealy models, asynchronous circuits, races, sequential machine decomposition, Self-timed system design. Offered fall.
Prerequisites: CSE 378 and APM 263.

CSE 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.

CSE 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.

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

ELECTRICAL ENGINEERING

EE 101 Introduction to Electrical and Systems Engineering (2)
Basic problem solving techniques of electrical and systems engineering. The course is centered around design/analysis projects which students carry out in small groups in a laboratory setting. One lecture and one laboratory per week. Can be used to satisfy EGR 101 requirement in electrical engineering. Credit cannot be received for both EE 101 and SYS 101.

EE 222 Introduction to Electrical Circuits (4)
Resistive dc circuits, Kirchhoff laws, Thevenin and Norton theorems, controlled sources, superposition, source transformations. Transient and forced responses in RC, RL and RLC circuits; impedance concept and phasors, RMS values and average power. Use of PSPICE. With laboratory. Offered fall, winter.
Prerequisite: MTH 155 and PHY 152.

EE 326 Electronic Circuit Design (4)
Semiconductor diodes and their applications; characteristics, models, analysis and design of diode circuits. Applications of bipolar and unipolar transistors, characteristics, models, analysis and design of single-stage and multistage transistor amplifiers. Design and applications of circuits with operational amplifiers. PSPICE software for device modelling. With laboratory and overall design emphasis. Offered fall, winter.
Prerequisite: EE 222 and major standing. Recommended corequisite: EE 384.

EE 345 Electric and Magnetic Fields (3)
Introduction to electromagnetic fields, Maxwell's equations, electrostatics, magnetic fields of steady currents, time varying fields. Introduction to wave phenomena, transmission lines, plane waves. Offered winter.
Prerequisite: MTH 254, EE 222 and major standing.

EE 351 Electromechanical Energy Conversion (3)
Magnetic circuits, transformers, electromechanical energy conversion. Operation of dc and ac machines. Equivalent circuits, input/output characteristics, torque and power analysis and efficiency. Design considerations for electrical machine drives. With laboratory. Offered fall.
Prerequisite: SYS 325.

EE 378 Design of Digital Systems (4)
Combinational and sequential logic circuits. Optimal designs. Circuits such as arithmetic units, encoders, decoders, multiplexers, PLAs and FPGAs. Sequential design techniques, flip-flops, state diagrams, excitation tables. Control and instrumentation applications. Data and address buses, registers and data transfer. Architecture design of small computers, microcontrollers and input/output communication systems. With laboratory. Offered fall, winter.
Prerequisite: CSE 171 and major standing.

EE 384 Electronic Materials and Devices (4)
Basic quantum mechanics leading to formation of the energy band diagram. Semiconductor device physics; charge carriers and conduction mechanisms. Theory of the P-N junction and metal semiconductor diodes. Bipolar transistors and unipolar field effect devices. Offered fall.
Prerequisite: Major standing.

EE 426 Advanced Electronics (4)
Transistor circuit design and analysis. Multistage small signal and power amplifier design, feedback, frequency response, stability and sensitivity. Design and analysis of linear/nonlinear circuits with operational amplifiers, regulator and power supply circuits; circuit protection. Design of signal generators and active filters. Emphasis on designing through laboratory experiments and projects. Offered winter.
Prerequisite: EE 326 and SYS 325.

EE 428 Industrial Electronics (4)
Applications of advanced electronics to manufacturing processes. Analysis and design considerations for industrial electronic systems. Hardware and software implementation in computer-integrated manufacturing (CIM) systems. Modeling and characteristics of integrated process elements. Transducers, signal conditioning and transmission; analog and digital controllers; thyristor commutation techniques; power supplies and interfaces, DC and AC drives and motor control circuits. With laboratory and design projects. Offered winter.
Prerequisite: EE 326 and SYS 325.

EE 437 Introduction to Communication Electronics (4)
Analysis and design of analog and digital electronic communication circuits and systems. Spectral analysis, linear system responses. Amplitude and angle modulation, AM and FM reception principles and receivers. Digital communication systems, pulse code modulation, time division multiplex, phase shift keying, frequency shift keying and other types of modulation. Introduction to noise and coding in communication systems. With laboratory. Offered fall, winter.
Prerequisite: EE 326 and SYS 325.

EE 470 Microprocessors-based Systems Design (4)
Application of microprocessors and microcomputers to the solution of typical problems; interfacing microprocessors with external systems such as sensors, displays and keyboards; programming considerations, microcomputer system and memory system design. A laboratory, design course; several short design projects and one large design project. Written report and oral presentation required. Credit cannot be earned for both CSE 470 and EE 470. Offered fall, winter.
Prerequisite: EE 378.

EE 472 Microcomputer-based Control Systems (4)
Computer-aided engineering, analysis, design, evaluation of control systems. Microcomputer/ microprocessor-based hardware and software development of digital controllers, estimators, filters. Data acquisition, signal conditioning and processing circuits, graphics displays. On-line system-level and board-level microcomputer-based control experiments. Laboratory and projects emphasize real-time applications, programming and hardware integration. Offered winter.
Prerequisite: EE 326 and SYS 431.

EE 473 Automotive Electronics (4)
Review of basic automotive electronic devices and circuits. Characteristics, models and interfacing of sensors and actuators. Basic electronic and electromechanical controllers; engines, transmission, brake, suspension and traction. Battery system supply. Ancillary system components: safety, auto theft, diagnostics, collision.
Prequisites: EE 222, SYS 325.

EE 475 Automotive Mechatronics I (4)
Overview of mechatronics; modeling, simulation, characterization and model validation of electromechanical devices; introduction to computer-aided software; basic automotive sensors; basic actuators and power train devices; principles of automotive and industrial electronic circuits and control systems (analog and digital); principles of product design; mechatronics case studies.
Prerequisite: SYS 325.

EE 485 VLSIC Design of Digital Chips (4)
Design techniques for rapid implementation and evaluation of Very Large Scale Integrated Circuits (VLSIC), including behavioral, functional, logic, circuit, device, physical IC fabrication, and layout issues. CMOS and pseudo nMOS technology, inverters, logic and transmission gates, switching characteristics and processing. Reliability, yield and performance estimation. The course is project oriented. Students start with concepts and finish with actual Application Specific Integrated Circuits (ASICs) using modern CAD tool suites. Offered winter.
Prerequisite: EE 384 or equivalent.

EE 487 Integrated Electronics (4)
Modern microelectronics processes and fabrication of integrated circuits. Crystal growth and wafer preparation, photolithography, dielectric and polysilicon film deposition, epitaxial growth, oxidation, diffusion, ion implantation, etching, metallization and integrated circuits layout principles. Introduction to MOS-based and bipolar junction transistor-based microcircuits design and fabrication. Fabrication processing simulation using SUPREM. With laboratory and projects. Offered winter.
Prerequisite: EE 384.

EE 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.

EE 491 Senior Design (4)
Design projects selected from: electronics, communications, instrumentation and measurements, automotive and industrial electronics, and control systems. Develops the system approach to design, involving preparation of specifications and considering items such as prototyping, modeling, simulation, and technological, environmental and financial aspects. Final results are presented in class and in a documented report.
Prerequisite: EE 326, 378 and either EE 437 or SYS 431.

EE 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.

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

MECHANICAL ENGINEERING

ME 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.

ME 208 Computer-Aided Engineering Graphics (4)
Engineering sketching, engineering drawing interpretation. Use of computer software such as AutoCAD and MSC/ARIES in engineering graphics: 2D and 3D geometric construction; orthographic projection; multiview layout; sectional and auxiliary views; dimensioning and tolerancing; exploded assembly drawings; solid modeling; Boolean operations; surface creation and intersection; surface rendering. Offered fall, winter.

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. Offered fall, winter.
Prerequisite: MTH 155. Corequisite: PHY 151.

ME 241 Thermodynamics (4)
The fundamentals of classical thermodynamics. The various forms of energy, and the effects of conversions and energy transfers on system and material properties. Thermodynamic property relationships are studied along with the fundamental laws of thermodynamics. Applications to engineering systems and processes. Laboratory emphasizes experimental design. Offered fall, winter.
Prerequisite: CHM 143, MTH 155, PHY 151.

ME 321 Dynamics and Vibrations (3)
Kinematics and dynamics of systems of particles. Work and energy, impulse and momentum. Planar rigid body motion. Vibration of lumped mechanical systems. Undamped and damped free vibrations including torsional vibrations for single-degree-of-freedom systems. Harmonically forced vibrations for single-degree-of-freedom systems. Applications to engineering problems. Offered fall.
Prerequisite: ME 221, APM 257. Corequisite: SYS 325.

ME 331 Introduction to Fluid and Thermal Energy Transport (4)
The fundamentals of fluid mechanics and heat transfer; conservation and momentum principles; viscous 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 engineering problems. Laboratory emphasizes experimental design. Offered fall, winter.
Prerequisite: ME 221, 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, factor of safety, yield and fracture criteria of materials with applications to design. With laboratory including two-dimensional truss and beam design on computer. Offered fall, winter.
Prerequisite: ME 221. Corequisite: ME 372.

ME 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. Offered fall, winter.
Prerequisite: CHM 143, PHY 152 and major standing.

ME 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.

ME 423 Acoustics and Noise Control (4)
Introduction to vibrations and waves; plane and spherical acoustic waves; sound generation, transmission and propagation; sound intensity and power; principles and definitions of noise control; sound and hearing; hearing conservation; community, building and industrial noise control; measurement of sound. Offered spring.
Prerequisite: ME 331, APM 257.

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. With laboratory emphasizing engineering design. Offered fall.
Prerequisite: ME 241, 331 and APM 257.

ME 448 Thermal Energy Transport (4)
Continued study of properties and descriptions of conduction, convection and thermal radiation heat transfer; thermal boundary layer theory; forced and natural convection, heat transfer correlations. Thermodynamics of thermal radiation, radiation intensity, surface properties and energy exchange. Laboratory emphasizes experimental design and development of empirical relationships. Offered winter.
Prerequisite: ME 241, 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 engineering and design problems. Offered winter.
Prerequisite or corequisite: ME 438 or 448 or equivalent.

ME 450 Computer-Aided Data Acquisition Analysis and Control (2)
Introduction to and a "hands-on" experience with computer-aided data acquisition, analysis and control as it relates to fluid and thermal experimentation and measurements. Topics include computer hardware and software, a variety of measurement and control instrumentation, communication between instrumentation and computer, ASYST programming language, instrument operation and calibration, data acquisition and analysis. Design-oriented laboratory projects. Offered fall.
Corequisite: ME 482.

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. Includes design project(s). With laboratory. Offered winter.
Prerequisite: ME 241 and 331.

ME 456 Energy Systems Analysis (4)
The analysis and design of thermodynamic systems. Applications include thermodynamic cycles for vapor-compression and air-standard power systems; the thermodynamics of non-reacting and reacting mixtures, including chemical equilibrium concepts; and available energy concepts. Design project (and/or laboratory) required. Offered winter.
Prerequisite: ME 241 and major standing.

ME 457 Internal Combustion Engines I (4)
Introduction to thermodynamics, fluid mechanics and performance of internal combustion engines including: introduction to engine types and their operation, engine design and operating parameters, ideal thermodynamic cycles, thermodynamics of actual working fluids and actual cycles, gas exchange processes, heat losses, performance, exhaust gas analysis and air pollution. With laboratory.
Prerequisite: ME 456; senior standing.

ME 461 Analysis and Design of Mechanical Structures (4)
Methods of advanced mechanics of materials applied to the design of mechanical structures. Topics include stress and strain analysis, force equilibrium, deformation compatibility, torsion of noncircular cross-sections, torsion of thick-walled tubes, shear centers, nonsymmetric bending, curved and composite beams and thick-walled cylinders. Offered fall.
Prerequisite: ME 361.

ME 467 Optical Measurement and Quality Inspection (4)
Topics include the state-of-the-art optical methods such as holography, shearography, moire, three-dimensional computer vision, electronic speckle pattern interferometry and laser triangulation; with applications to measurement of displacement, vibrational mode shapes, material properties, residual stresses, three-dimensional shapes, quality inspection and nondestructive testing. Offered fall.
Prerequisite: ME 321, 361, senior standing in Engineering.

ME 472 Materials Properties and Processes (4)
Study of mechanical behavior of real engineering materials and how they influence mechanical design. True stress/strain properties of materials, plastic deformation and fracture of materials, failure theories, fatigue damage under cyclic loading, creep and high temperature applications. Material properties of engineering metals, ceramics and composites. Behavior of materials during and after manufacturing processes such as stamping, drawing, extrusion, etc. Offered winter.
Prerequisite: ME 361, 372.

ME 474 Manufacturing Processes (4)
Fundamentals and technology of machining, forming, casting and welding. Mechanics of cutting. Molding of polymers. Tolerancing and surface topography. Manufacturing considerations in design. Economics of manufacturing. With laboratory. Offered fall.
Prerequisite: ME 331, 372.

ME 475 Lubrication, Friction, and Wear (4)
Study of fundamental wear mechanisms including: adhesive, abrasive, corrosive and surface fatigue. Boundary and hydrodynamic lubrication. Friction theories. Surface topography characterization. Applications: journal and ball bearings, gears and engine components. Offered spring.
Prerequisite: ME 331, 372 and senior standing in Engineering.

ME 476 Product and Process Development (4)
Topics include traditional and nontraditional approaches in product and process development and optimization, including conventional experimental mechanics and acoustic test methods. The Taguchi approach and other methods for design of experiments are used to study the interaction of variables and to attain optimization.
Prerequisite: SYS 317. Corequisite: ME 486 or 487.

ME 477 Concurrent Engineering (4)
Principles of concurrent engineering including: manufacturing competitiveness, performance indicators, life-cycle management, strategic technology insertions, process re-engineering, cooperative work teams, supplier organization, information modeling and product realization taxonomy. Credit cannot be received for both ME 477 and SYS 477.
Prerequisite: Senior standing.

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 for the purpose of design and optimization of systems are emphasized using basic integral, differential and lumped-parameter modeling techniques. The course bridges conventional engineering design disciplines with design-oriented laboratory projects. Offered fall.
Prerequisite: ME 241, 331 and APM 257.

ME 484 Automotive Engineering Design I (4)
Tire forces and moments, rolling resistance of tires, tractive effort and longitudinal slip, tires on wet surfaces, ride properties of tires; equation of motion and maximum tractive effort, aerodynamic forces and moments, power plant and transmission characteristics, prediction of vehicle performance, operating fuel economy, engine and transmission matching, braking performance.
Prerequisite: Senior standing.

ME 486 Machine Design (4)
Study of machine elements and systems. Stress, strength, deflection, buckling and cost considerations, design optimization criteria and strategies. Analysis and design of fasteners, springs, welds, bearings, power transmitting elements and complex structures subjected to static and/or dynamic loads. Includes major design project. Offered winter.
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 modeling and interactive design. Analysis and evaluation of the static, dynamic and thermal mechanical systems designed on the CAD/CAM system. Includes design project(s) in various topics. Offered fall.
Prerequisite: ME 361. Corequisite: ME 321.

ME 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.

ME 492 Senior Mechanical Engineering Design Project (3)
Independent or team experience in engineering design of systems, components or processes involving mechanical and/or fluid and thermal sciences. Emphasis will be given to the design process, utilizing the fundamental concepts, principles and methodologies encountered in earlier course work. Projects, both individual and team, will be supervised by mechanical engineering faculty. Normally taken during senior year. Offered fall, winter.
Prerequisite: ME 331, 361 and approval of project faculty supervisor.

ME 493 Senior Manufacturing Engineering Design Project (3)
Independent or team experience in manufacturing engineering design, including materials and manufacturing processes; process assembly and product engineering; manufacturing productivity and quality; and manufacturing integration methods and system design. Projects will be supervised by mechanical engineering faculty. Normally taken during senior year. Offered fall, winter.
Prerequisites: ME 474, senior standing.

ME 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.

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

SYSTEMS ENGINEERING

SYS 101 Introduction to Electrical and Systems Engineering (2)
Basic problem solving techniques of electrical and systems engineering. Course is centered around design/analysis projects which students carry out in small groups in a laboratory setting. One lecture and one laboratory per week. Can be used to satisfy EGR 101 requirement in systems engineering. Credit cannot be received for both SYS 101 and EE 101.

SYS 317 Engineering Probability and Statistics (3)
Elements of probability for discrete and continuous random variables; examples and problems from various areas of engineering are used to illustrate developments and their applications. Topics covered include finite sample spaces, two or more events, random variables, distribution functions, expected value, functions of a random variable, two or more random variables; introduction to statistics, sampling distributions, parameter estimation and hypothesis testing. Offered fall, winter.
Prerequisite: Major standing. Corequisite: MTH 254 or 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-, second-, and higher-order systems. Relationship between pole-zero pattern and dynamic response. Frequency response methods. Computer techniques for analysis and design. Offered fall, winter.
Prerequisite: EE 222, ME 221, APM 257 and major standing.

SYS 410 System Optimization and Design (4)
Classical optimization techniques including Lagrange multipliers and Kuhn-Tucker conditions. Computer techniques for system optimization including linear programming, constrained and unconstrained nonlinear programming. System design case studies. The course emphasizes a capstone design experience involving system modeling, simulation and optimal design. Offered fall, winter.
Prerequisite: MTH 256 and SYS 325.

SYS 422 Robotic Systems (4)
Overview of industrial robots, their components and typical applications. Kinematics of robots and solution of kinematic equations. Trajectory planning and the Jacobian matrix. Robot programming languages and task planning. Laboratory experience in the development and implementation of a robot language environment using minirobots. Demonstrations and applications using industrial robots. Offered fall.
Prerequisites: CSE 131 and SYS 325.

SYS 431 Automatic Control Systems (4)
Performance specifications for feedback control systems. Modeling, transfer functions, block diagrams, signal flow graphs, Mason's formula. Static error coefficients, stability theory, Routh's criterion. Root locus and frequency response; Nyquist criterion. Design of proportional, integral and derivative controllers; compensation networks. Laboratory includes the analysis of physical systems; design and realization of controllers. Offered fall and winter.
Prerequisite: SYS 325.

SYS 433 Modern Control System Design (4)
Design methodology for control systems via state space modeling. Physical systems, time response, stability, transition matrix, state feedback control. Integrated system design, state observers. Analytical and computer simulations. Course includes a project in which the student models, designs, implements and evaluates a controller for a physical system. With laboratory. Offered fall.
Prerequisite: SYS 431.

SYS 458 Electrical Energy Systems (4)
Generation, transmission and distribution of electrical energy. Analysis and design of three-phase circuits, representation of power systems and per unit normalization, symmetrical components and stability, unsymmetrical faults. Computer-aided problem solving included. Offered winter.
Prerequisite: SYS 325.

SYS 463 Foundations of Computer-Aided Design (4)
Computer-aided design as the cornerstone of computer-aided manufacturing. Presentation and exploration of "generic" CAD architecture. Mathematical representations of CAD primitives, surfaces and solids and manipulation. Comparison of wire-frame, surface, 2-1/2 D and solid models. IGES, STEP, CALS, and DXF standards Description of "feature based CAD" and the CAD manufacturing link.
Prerequisite: Major standing.

SYS 469 Computer Simulation in Engineering (4)
Simulation as modeling tool for discrete-event and continuous systems, general principles of simulation, statistical models, input modeling, random variable generation, model building using a commercial simulation language, model verification and validation, determination of run length, output analysis, variance reduction techniques. Design and optimization of production service systems. Offered winter.
Prerequisites: SYS 317, 325.

SYS 475 Automotive Mechatronics I (4)
Overview of mechatronics; modeling, simulation, characterization and model validation of electromechanical devices; introduction to computer-aided software; basic automotive sensors; basic actuators and power train devices; principles of automotive and industrial electronic circuits and control systems (analog and digital); principles of product design; mechatronics case studies.
Prerequisite: SYS 325.

SYS 477 Concurrent Engineering (4)
Principles of concurrent engineering including: manufacturing competitiveness, performance indicators, life-cycle management, strategic technology insertions, process re-engineering, cooperative work teams, supplier organization, information modeling and product realization taxonomy. Credit cannot be received for both SYS 477 and ME 477.
Prerequisite: Senior standing.

SYS 483 Production Systems (4)
Design issues to control the flow of material in manufacturing systems from forecast to finished product. Topics include characterization of production systems, aggregate planning and disaggregation to a master schedule, inventory control, MRP, JIT systems, scheduling and sequencing, project planning and resource balancing.
Prerequisite: SYS 317.

SYS 484 Flexible Manufacturing Systems (4)
The components of flexible manufacturing systems (FMS): CNC machining centers, automated assembly, automated warehousing (AS/RS), inspection, material transport, programmable logic controllers and coordination; integration of CAD, CAM, to the FMS; production planning and control; factory simulation; implementation strategies. With laboratory. Offered winter.
Prerequisite: Major standing.

SYS 485 Statistical Quality Control (4)
Fundamentals of statistical quality control and their use in system design. Control charts for variables, control charts for attributes, cusum charts, and other process quality monitoring topics. Sampling inspection plans. Fundamentals of design of experiments and their application to product/process design and improvement. Taguchi's approach to robust design and related topics. Offered winter.
Prerequisite: SYS 317.

SYS 487 Foundations of Systems Engineering (4)
Techniques for generation, analysis, and verification of traceable product requirements. System performance and structural modeling using object, behavioral, and other models. Techniques for analysis of system for serviceability, reliability, maintainability, and testability. System alternative trade-off study techniques. System life cycle and other tools for implementation of systems engineering techniques.
Prerequisite: Senior standing.

SYS 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.

SYS 491 Senior Design (4)
Design projects selected from: manufacturing systems, control systems, automotive and industrial systems, and instrumentation and measurement. Develops the system approach to design, involving preparation of specifications and considering items such as prototyping, modeling, simulation, and technological, environmental and financial aspects. Final results are presented in class and in a documented report.
Prerequisite: EE 326, SYS 431 and either EE 351 or 378. Alternately, SYS 483, 485 and either SYS 422 or 484.

SYS 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.

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

GENERAL STUDIES

121 NORTH FOUNDATION HALL (248) 370-3227

Director: *Carole L. Crum*

Faculty Council for General Studies: *Ann Pogany, chairperson; Linda Benson, associate professor, History; William Fish, associate professor, Human Resource Development; Robert Gaylor, associate professor, Kresge Library; Thaddeus Grudzien, associate professor, Biological Sciences;Niels Herold, assistant professor, English; Linda Hildebrand, assistant professor, Kresge Library; Roy Kotynek, associate professor, History; Jerry Marsh, special instructor, Engineering; Ramune Mikaila, special instructor, Nursing; Nivedita Mukherji, assistant professor, Economics; Kevin Nathan, associate professor, Accounting; Subbaiah Perla, professor, Mathematical Sciences; Brian Sangeorzan, associate professor, Engineering; Robert Stern, associate professor, Chemistry; Mary Ann Weller, assistant professor, Medical Laboratory Sciences*

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 many departments 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.

Students changing major into B.G.S. must meet the program requirements described in the catalog extant at the time of the change, or they may meet program requirements described in a subsequent catalog. Any catalog that students are following must not be more than six years old at the time of graduation.

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.

Students applying to the General Studies program are first admitted to pre-B.G.S. status. Students will be granted major standing upon approval of their plan of study and supporting rationale by the General Studies Faculty Advising Committee. The B.G.S. program is administered by the Department of Academic Services and General Studies (121 North Foundation Hall, 370-3227).

As the Bachelor of General Studies is an alternative to a traditional degree, it is not permissible to seek a double degree with the Bachelor of General Studies serving as one of those degrees.

Two-Plus-Two program for associate degree holders

The General Studies program allows students to combine broad liberal arts and professional courses from the university curriculum 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 community colleges 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 has been taken at accredited institutions. Certain developmental courses may be subject to individual evaluation. For additional information, see the *Transfer student information* section of the catalog.

Advising

Advising is central to the program as students design an individualized and unique program of study based upon their interests and needs. Students must follow a specific advising procedure as follows:

1. Meet with a General Studies counselor in a preliminary appointment. The counselor will explore the suitability of the program to student needs and interests. The counselor will also discuss student eligibility to enter the program. Students entering the program through a change of major or through the readmission process must have a cumulative grade point average of at least 2.00. Students on academic probation will not be considered for the program.
2. Be assigned a faculty adviser. When pre-B.G.S. has been declared as a program of study, students will again meet with the counselor to receive the plan of study form and rationale guidelines. Students and the counselor will mutually select a faculty adviser.
3. Develop a plan of study and rationale with the faculty adviser. Students will initiate a meeting with the faculty adviser to discuss their goals and the courses that may help achieve those goals. In addition to creating a plan of study, students will write a rationale for course selection.
4. Attain committee approval. After the faculty adviser approves them, the plan of study and rationale are returned to the General Studies office and sent to the Faculty Advising Committee for approval. When the plan of study and rationale have been approved at a monthly meeting of the committee, students will be granted major standing.
5. Make substitutions as needed to the plan of study. Students who want to take courses other than those listed on their approved plans of study must have the consent of their faculty adviser or a General Studies counselor. Plan of Study Substitution forms are available from the General Studies office or faculty advisers. They must be submitted to the General Studies office.

Requirements for the degree in Bachelor of General Studies

To earn the Bachelor of General Studies degree, students must meet the following requirements:

1. Successfully complete at least 24 credits at Oakland University as an admitted candidate for the Bachelor of General Studies degree, excluding courses used to meet the writing proficiency requirement or the general education requirement. Candidacy is authorized by the university and the Faculty Council for General Studies when a student's plan of study and supporting rationale have been approved by the General Studies Faculty Advising Committee. If the plan of study is not submitted in a timely manner, the credits in any current semester may be excluded from the plan of study. (See *Advising* above for additional information.)
2. Complete the writing proficiency requirement.
3. Complete the general education requirements. (See *Undergraduate degree requirements.*)
4. Complete the university ethnic diversity requirement. (See *Undergraduate degree requirements.*)

5. Complete a minimum of 124 semester credits.
6. Complete 32 of those credits at the 300 or 400 level.
7. Complete 32 credits at Oakland University; complete the last 4 credits toward the degree at Oakland.

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. Approximately 50 minors and concentrations are available to General Studies students; a complete listing may be obtained from the General Studies office. Forms for written approval of concentrations or minors can be obtained from the General Studies office (121 North Foundation Hall).

Students should consult a General Studies counselor to determine policies and procedures on seeking minors or concentrations.

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 earn conciliar honors. Students who have cumulative grade point averages of 3.60 or better are automatically eligible 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. Written 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.

Northwestern Michigan College University Center

Students who have completed an associate degree at Northwestern Michigan College (NMC) can continue work toward a Bachelor of General Studies or a Bachelor of Arts with a major in Communication through the University Center at NMC. Complete program information is available through the Oakland University representative at the NMC University Center (Boardman Lake Campus, 616-922-1770) or the Department of Academic Services and General Studies (121 North Foundation Hall, 248-370-3227).

SCHOOL OF HEALTH SCIENCES

357 HANNAH HALL
(248) 370-3562
Fax: (248) 370-4227

Dean: *Ronald E. Olson*

Office of the Dean: *Arthur J. Griggs, assistant to the dean; A. Jayne Hoskin, academic adviser; Pamela A. Marin, director, Center for Professional Development; Alfred W. Stransky, director, Meadow Brook Health Enhancement Institute*

Professor: *Gary D. Russi*

Consulting professors: *Kenneth L. Uruiller, John R. Ylvisaker*

Clinical professors: *Bernard Bercu, Seymour Gordon, Moon J. Pak, John R. Pfeifer*

Clinical associate professors: *Ali A. Abbasi, Frank E. Check, George R. Gerber*

Clinical assistant professors: *Jack Belen, Peter M. Boruta, Dennis Chong, Muhammad N. Kahn, Neil Levitt, Dennis J. Malloy, Jeffrey P. Yanez*

Board of Visitors

The Board of Visitors for the School of Health Sciences is composed of community leaders directly interested in issues of health and health care education. The board helps the school to encourage healthy living as a means to promote wellness, and to encourage safety maintenance in the home and workplace. In addition, the board helps the school to develop curricula and continuing education initiatives to meet community needs regarding current knowledge about the delivery of health care. Board members offer advice on needed research and long-range planning for the school.

Members of the Board of Visitors are:

Anthony Tersigni, Ed.D., (Chair) President and CEO, St. John Health System
Robert L. Davis, M.B.A., President and CEO, North Oakland Medical Center
Thomas Feurig, M.H.A., President and CEO, St. Joseph/Mercy Hospital - Oakland
John Hoffman, Ph.D., President and CEO of Safety Engineering Labs, Inc.
John Jamian, B.A., Kheder and Associates
John Labriola, M.B.A., Vice Preseident and Hospital Director, William Beaumont Hospital - Royal Oak
Barbara Moore, M.S., R.N., Vice President, Nursing and Allied Health Services, Mercy Health System
Joseph Tasse, M.S., Vice President, Clinical and Support Services, Oakwood Healthcare System

General Information

The School of Health Sciences offers degree and nondegree programs in health and medically related fields. Bachelor of Science degree options include health sciences, industrial health and safety and medical laboratory sciences. A program leading to the Master of Physical Therapy degree is offered to students initially completing the Bachelor of Science in health sciences with a focus in physical therapy. Programs leading to the Master of Science degree include exercise science and physical therapy. Nondegree programs include exercise science and health behavioral sciences at the undergraduate level and the graduate certificate in orthopedic manual physical therapy and graduate certificate in pediatric rehabilitation at the graduate level.

Continuing education is offered by the School of Health Sciences Center for Professional Development in order to meet the educational needs of health science professionals. Special-

ized contract programs are also provided to meet the unique professional staff development needs of employers in health care, business and industry, government, and other settings. Programs are individually tailored to meet the specific workplace needs of professionals and employers. Programs and courses are offered either for university credit or noncredit. When noncredit programs and courses are offered they carry the nationally recognized Continuing Education Unit (CEU).

The Meadow Brook Health Enhancement Institute is a university facility of the School of Health Sciences. The institute offers programs addressing health promotion and disease prevention, including programs for health maintenance, cardiac rehabilitation, diabetic health, women's health, nutrition, weight control, stress management, smoking cessation, movement re-education and others. The full-time staff of the institute provides these programs to the university community as well as to the public at large through individual or corporate associations.

Admission to any program offered by the School of Health Sciences may be considered on a competitive basis if the balance between applicants and available instructional resources requires such action to maintain the academic integrity of the program.

School programs with laboratory and internship components require that physical, cognitive, and psycho-social technical standards be met. Students with disabilities who have questions about meeting these standards are encouraged to contact the Office of Disability Support Services, 157 North Foundation Hall, (370-3266).

High school students considering a major in any of the programs offered by the School of Health Sciences should consult the *Admissions* section of the catalog for specific preparation requirements.

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.

Students pursuing the physical therapy degree are initially required to complete a preprofessional program (pre-physical therapy), which includes the health science core curriculum. Following this step, students must apply for admission to major standing in physical therapy, which is both selective and competitive. The limited number of students accepted into the major program must complete the Bachelor of Science in health sciences with an academic focus in physical therapy and Master of Physical Therapy degree in order to function professionally as physical therapists.

The programs in industrial health and safety and medical laboratory sciences do not incorporate a preprofessional 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 laboratory sciences 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 and ethnic diversity 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 or program course work requirements have been met. See *Transfer student information* for additional information.

Core curriculum courses*

BIO 111; 207 or 321
CHM 157-158
MTH*
STA 225 or 226
PHY 101-102 or 151-152
HBS 200**

*See the academic requirements of the individual health science programs for core curriculum course preferences or requirements.

**This course satisfies the university ethnic diversity requirement.

Academic advising

A professional academic adviser is available to assist students with degree requirements, plans of work, course scheduling, transfer course evaluation, establishing academic goals, health career choices and the process of achieving major standing. The health sciences advising office is located in 159 Vandenberg Hall (370-4195). Freshman and transfer orientation advising is required of all entering students. Thereafter, students are encouraged to make appointments with the adviser periodically to monitor their progress. Health sciences faculty members are also available to assist with curriculum and course questions once students are enrolled in health science major course work.

An elective course, HS 102, Career Exploration in the Health Sciences, is offered to provide students with resources, skills and experiences necessary to make a reasonable choice for their major and career. Included in this course are seminars presented by health care professionals from a variety of disciplines.

To avoid delays in seeing an adviser, students are encouraged to schedule advising appointments during times other than early registration periods. Advisers are obligated to assist students in planning their programs. Ultimately, students are responsible for understanding and fulfilling the degree requirements for graduation as set forth in this catalog.

Approved minors

School of Health Sciences students may elect to complete a minor in another discipline offering such an option. It is recommended that students who are considering declaring a minor consult as early as possible with the School of Health Sciences academic adviser and the minor field adviser. Credits earned toward a degree in the School of Health Sciences can be double counted toward any minor to which they would otherwise apply that is offered by the other schools or the college.

Petition of exception

For students enrolled in health science programs, all petitions of exception must be reviewed by a faculty member or the academic adviser and reviewed by the appropriate program director before referral to the Health Sciences Committee on Instruction. See the *Academic Policies and Procedures* section of the catalog for further information *(Petition of exception)*.

Exercise Science Program

Acting Director: *Stafford Rorke*

Associate professors: *Brian R. Goslin, Robert W. Jarski, Charles R. C. Marks, Alfred W. Stransky*

Clinical professors: *Barry A. Franklin, Murray B. Levin, Augustine L. Perrotta*

Clinical associate professors: *John F. Kazmierski, Steven J. Keteyian, Creagh E. Milford, Rajendra Prasad*

Adjunct assistant professor: *Jack T. Wilson*

Clinical assistant professors: *Roger Byrd, Jeffrey H. Declaire, Albert A. DePolo, Roland Gerhard, William E. Hill, Andrew J. Madak, Chandra S. Reddy*

Clinical instructors: *Henry R. DeLorme, Mary Ann Faarup, Nancy S. Kennedy*

Lecturer: *Roberta J. Dailey*

The exercise science program offers elective courses for students interested in the relationship among physical activity, weight control, disease prevention, stress management and nutrition for optimal health and performance.

Opportunities exist for students to establish personal programs of exercise, weight control, nutrition, stress management and substance abuse avoidance.

Disease prevention and quality of life are components of many of the course offerings. Selecting courses in exercise science can be especially meaningful to students entering a health-related career, with the current emphasis placed on health promotion and disease prevention within the health care delivery system.

Students can complete a baccalaureate degree in health sciences with an exercise science academic focus. See *Health Sciences Program* in this section of the catalog. For a description of the Master of Science in exercise science program, see the *Oakland University Graduate Catalog*.

Minor in exercise science

A minor in exercise science is available to students seeking a formal introduction to the exercise science field. An undergraduate degree focusing on exercise science may be designed by including this minor in a Bachelor of Science in health sciences or a Bachelor of General Studies plan of work. Courses required for the minor include: HS 201; EXS 204, 304*, 350*; and 6 credits from the following electives: EXS 101-105* (4 credits maximum will count toward the minor; EXS 103* and one other elective from EXS 101-105 are required to satisfy the prerequisite for the M.S. in Exercise Science program), 207*, 215, 321, 360, 405, 410, 445, 465, 493 (2 credits maximum). Courses denoted with an asterisk (*) represent prerequisite courses for admission to the Master of Science in exercise science program. (An additional prerequisite for admission to this graduate program is STA 225 or 226 or PSY 251.)

Course Offerings

Note regarding EXS 101, 102, 104 and 105: Because of similar course content, students enrolling in more than one of these courses may not repeat the lectures or final examination, but must complete an independent project and/or a different final examination.

EXS 101 Exercise (Jogging) and Health Enhancement (2)
Examination of lifestyle factors related to disease prevention and improved quality of life. Combines regular walking-jogging exercise and health enhancement lectures. Fall and winter semesters.

EXS 102 Exercise (Swimming) and Health Enhancement (2)
Examination of lifestyle factors related to disease prevention and improved quality of life. Combines regular swimming exercise and health enhancement lectures. Fall and winter semesters.

EXS 103 Exercise (Strength Training) and Health Enhancement (2)
Examination of lifestyle factors related to disease prevention and improved quality of life. Combines regular strength training exercise and health enhancement lectures. Fall, winter and spring semesters.

EXS 104 Exercise (Aerobics) and Health Enhancement (2)
Examination of lifestyle factors related to disease prevention and improved quality of life. Combines regular aerobic exercise and health enhancement lectures. Fall and winter semesters.

EXS 105 Cardiovascular Fitness Training (2)
Examination of lifestyle factors related to disease prevention and improved quality of life. Combines exposure to walking-jogging exercise, aerobics exercise, standard cardiovascular training equipment, swimming exercise and health enhancement lectures. Fall and winter semesters.

EXS 204 Weight Control, Nutrition and Exercise (4)
Exploration of the role of exercise and optimal nutrition in weight control/loss. Emphasis on effective eating, energy balance, physiology of weight loss, behavior modification and health risks of obesity. Includes practical laboratory experiences. Recommended for students wishing to develop successful weight loss/control skills and improved nutritional habits. Fall semester.

EXS 207 Safety and First Aid in Exercise Settings (2)
Understanding of procedures in the immediate and temporary care of victims of an accident or sudden illness in exercise settings. Safety concerns regarding exercise facilities, equipment and programs. Certification in American Red Cross "Responding to Emergencies" and "Basic Life Support" upon completion. Fall semester.

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

EXS 304 Exercise Physiology (4)
Effects of exercise and physical training on the physiological systems of the body, with emphasis on cardio-respiratory systems. Includes muscle contraction mechanisms, circulatory and respiratory adjustment during exercise, and nutrition for physical activity. Laboratory experiences are provided for insight into the dynamics of human performance. Fall and winter semesters.
Prerequisite: BIO 111 and 207.

EXS 321 Basic Athletic Training (2)
Identical with PT 321.
Prerequisite: BIO 205, 207; EXS 350 or PT 300.

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. Fall semester.
Prerequisite: BIO 205.

EXS 360 Healthy Lifestyle Choices (2)
A biopsychosocial approach to exercise and other healthy lifestyle choices. Focus is on the dimensions of wellness, factors influencing lifestyle choices, the theory and practice of behavior change, and health promotion concepts. Credit will not be granted for both EXS 360 and EXS 560. Offered spring term.
Prerequisite: PSY 100; EXS 204 or 304 or HS 201.

EXS 401 Practicum in Exercise Science (5)
Supervised experience in a wide variety of educational exercise science settings. Students must be approved to attend a practicum site prior to registration. A list of approved practicum sites is available through the program office. Offered fall, winter, spring, summer.
Prerequisite: EXS 304, 350, program permission.

EXS 405 Health and Disease (2)
Examination of the health and medical record with a focus on the history, physical exam, and laboratory and imaging studies. The pathogenesis of representative diseases that are lifestyle related are emphasized. Credit will not be granted for both EXS 405 and EXS 505. Offered spring term in odd-numbered years.
Prerequisite: BIO 111 and 207, or instructor's permission. BIO 205 recommended.

EXS 410 Clinical Biomechanics (2)
The pathomechanics of the human musculoskeletal system. Topics include properties of human tissue, mechanisms of injury, pathokinesiology, and principles of musculoskeletal exercise prescription. Credit will not be granted for both EXS 410 and EXS 610. Offered fall semester in even-numbered years.
Prerequisite: EXS 350 or instructor's permission.

EXS 445 Physical Activity and Aging (2)
The effects of aging on physical work capacity, body composition, and cardiovascular, pulmonary, neuromuscular and musculoskeletal function. The principles for prescribing and conducting physical conditioning programs to retard the aging process are included. Credit will not be granted for both EXS 445 and EXS 545. Offered summer term.
Prerequisite: EXS 304 and 350.

EXS 465 Corporate and Worksite Wellness Programs (2)
Concepts underlying corporate and worksite health promotion programs, including: health and exercise program planning, facility planning and design, program management, staffing, equipment selection, safety and legal issues, and marketing. Credit will not be granted for both EXS 465 and EXS 565. Offered spring term in odd-numbered years.
Prerequisite: EXS 304 or instructor's permission.

EXS 493 Directed Study and Research (1, 2, 3 or 4)
Special study areas and research in exercise science. May be repeated for additional credit. Offered every semester.
Prerequisite: Program permission.

Health Behavioral Sciences Program

Director: *Carl R. Vann*

Professors: *Ronald E. Olson, Philip Singer, Carl R. Vann*

Clinical professor: *Daniel E. DeSole*

Clinical associate professor: *Michael N. Musci*

Clinical assistant professors: *Jay W. Eastman, Jed G. Magen*

Adjunct assistant professors: *William Dobreff, Anthony R. Tersigni, Marco G. Vascon*

Adjunct instructor: *Paul S. Peabody*

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, 300, 359, 400 and 499; AN 333 and 420; ECN 467; and PA 568 and 569.

Course Offerings

The program offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

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. *Satisfies the university ethnic diversity requirement.*

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. May be repeated for a maximum of 16 credits.

HBS 359 Public Policy and Health Care (4)
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. May be repeated for a maximum of 16 credits.

HBS 450 Law, Values and Health Care (4)
An examination of the legal concepts, problems and institutions that shape and control professional responsibility, the problems associated with maintaining and terminating life, licensure and related questions in the organization and delivery of health care services.

HBS 499 Senior Seminar in Health Behavioral Sciences (4)
An integration of ideas, issues, and research dealing with the place and application of the behavioral sciences to health and medicine. Primarily for persons in the health behavioral sciences concentration or contemplating graduate programs in public health, health administration, medical or other professional schools.

Health Sciences Program

A Bachelor of Science in health sciences degree combines a broad spectrum of liberal arts, basic sciences, social sciences and health science course requirements and electives for students who desire a generalized health science academic credential. In addition, students choose one of four academic focus areas to obtain greater exposure to a specific health discipline. These four focus areas include exercise science, industrial health and safety, physical therapy and preprofessional studies. Students completing the exercise science focus area obtain all the academic course prerequisites necessary for consideration for admission to the Master of Science in exercise science program. The industrial health and safety focus area provides exposure to the fundamental principles of this profession in preparation for further study in this field or as a complement to another career. The physical therapy focus area is limited to only those students accepted into the three-year physical therapy professional program. Such students complete the Bachelor of Science before going on to the Master of Physical Therapy curriculum. The preprofessional focus area incorporates basic science courses to prepare students for the traditional application requirements for medical, dental, optometric, and other professional schools.

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

1. Complete the writing proficiency requirement. In satisfying this requirement, students may need to complete RHT 150 and 160 (with grades of 2.0 or better), or their

equivalents at another college or university. Not all credits associated with these courses will apply to the 136-140 credits required for the degree.

2. Meet the university general education requirements (see *Undergraduate degree requirements)*. In completing the health science core curriculum and additional required courses which complement the core curriculum, health sciences majors will automatically satisfy the requirements in mathematics, logic and computer science; natural science and technology; and social science.
3. Complete the university ethnic diversity requirement. For health sciences majors, this requirement is satisfied by completing the health science core curriculum course, HBS 200.
4. Complete the health science core curriculum (see *Health science core curriculum*). MTH 141 is the required math core course for this program.
5. Complete these additional required courses which complement the core curriculum: BIO 205 or 381, BIO 206 or 322, HBS 450 or PHL 302 or 318, HS 401, PHY 158, PSY 100 or 130. Note: Students admitted to physical therapy major standing are not required to take the ethics course requirement listed above (HBS 450 or PHL 302 or 318). Ethical issues are covered in courses which are an integral part of the physical therapy focus area. BIO 381 may only be taken by students admitted to physical therapy major standing.
6. Complete the prescribed number of credits from the following courses: BIO 325; CHM 201; CSE 125; EXS 215, 304, 321, 360, 405, 445, 493; HRD 335; HS 201, 331, 451; IHS 305, 306, 315, 316; MLS 210; MTH 122 or 154; PSY 225 or 321 or 323 PSY 250, 333, 338, 344; SOC 328. The preprofessional academic focus requires 26 credits. The industrial health and safty academic focus requires 26 credits, which must include all IHS courses listed above. The exercise science academic focus requires 26 credits, which must include EXS 304, HS 201 and 451, and PSY 250. The physical therapy academic focus requires 10 credits as follows: EXS 304, HS 331, and PSY 225 or 321 or 323.
7. Complete the course requirements specified under one of the four academic focus areas (exercise science, industrial health and safety, physical therapy, or preprofessional studies).

Exercise science academic focus course requirements

Students completing the Bachelor of Science in health sciences with an academic focus in exercise science must complete a minimum of 136 credits, including the following courses:

1. EXS 101-105 (EXS 103 and 1 other course), EXS 204, 207, 350, 401; PHY 344
2. Complete 12 credits from the following list of electives: EXS 215, 321, 360, 405, 410, 445, 465, 493.

Industrial health and safety academic focus course requirements

Students completing the Bachelor of Science in health sciences with an academic focus in industrial health and safety must complete a minimum of 136 credits, including the following courses:

1. BIO 205; CHM 234, 235; IHS 305, 306, 315, 316, 403.
2. Complete 12 credits from the following list of electives: IHS 319, 410, 415, 420, 423, 430, 433, 451, 453, 460, 464 and 480.

Physical therapy academic focus course requirements

Students completing the Bachelor of Science in health sciences with an academic focus in physical therapy must complete a minimum of 140 credits, including the following requirements:

1. Be admitted to major standing in the professional program. See *Admission to major standing* under the section *Physical Therapy Program*.
2. BIO 460, PT 300, 301, 311, 324, 330, 331, 332, 333, 334, 351, 360, 370, 420, 442, 452, 460.

Preprofessional academic focus course requirements

Students completing the Bachelor of Science in health sciences with an academic focus in preprofessional studies must complete a minimum of 136 credits, including the following courses:

1. BIO 113, 323, 324, 325, 326, 341; CHM 234, 235, 237, 238.
2. Complete 5 credits of elective courses which have been approved by the student's academic adviser.

Course Offerings

The school offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

HS 102 Career Exploration in the Health Sciences (1)
An introductory course specifically for students considering a career in the health sciences. Students will be provided with resources, skills, and experiences necessary to make a reasonable choice for their major and career. Recommended for undecided health science and pre-physical therapy majors in their sophomore year.

HS 201 Health in Personal and Occupational Environments (4)
Current information about the impact of environmental and lifestyle 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)
An introduction to the principles of pharmacology, including the principles of drug therapy and the actions of the basic classes of drugs. Will satisfy requirements for NRS 230.
Prerequisite: BIO 207 or 321.

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.
Prerequisite: BIO 111 and BIO 207 or 321.

HS 405 Special Topics (2, 3 or 4)
May be repeated for additional credit.
Prerequisite: Permission of instructor.

HS 451 Mind-Body Medicine (2)
Examines the role of stress, emotions and other psychological states that bring about physiological changes affecting health and disease. Topics include psychoneuroimmunology, stress management, guided imagery, the relaxation response, exercise, nutrition, laughter and humor, and the role of personality. Applications include patient motivation, empowerment and variability in response to treatment.

HS 490 Directed Study (1, 2, 3 or 4)
Student-initiated and problem-oriented directed study focusing on health science issues. May be repeated for additional credit. Graded numerically or S/U.
Prerequisite: Departmental permission.

Industrial Health and Safety Program

Director: *Stephen K. Hall*

Professor: *Stephen K. Hall*

Associate professor: *Richard J. Rozek*

Adjunct associate professor: *John M. Hoffmann*

Adjunct assistant professors: *Joseph A. Calcaterra, Vikas Kapil, Jane Meikle Krebs*

Adjunct instructors: *Frank M. Cleary, Patrick R. Frazee, Darryl C. Hill, C. Brian Malley, Daniel Markiewicz, Daniel Maser, Saruonas S. Mingela, Rico J. Odorico, Barbara R. Ondrisek, Thomas W. Schenk, Rikki Schwartz, Lynn Sherman, James M. Weiskopf, Andrew P. Wood*

Industrial health and safety is a specialized branch of the health professions focusing on the environment of workers. Professionals in this field strive to find and eliminate conditions in the work place that may result in occupational injury or disease. This is achieved through a process of anticipation, recognition, evaluation and control of the various stresses that contribute to unsafe working environments. These stresses may be of a mechanical, electrical, chemical, physical, biological or ergonomic nature.

The industrial health and safety program is multidisciplinary in nature, providing students with relevant exposure to basic science and behavioral science subjects as well as a thorough introduction to industrial hygiene and industrial safety concepts. A one-semester internship requirement provides students in the senior year of the program with firsthand field experience in the practice of this profession.

Graduates of the program will find employment opportunities within industrial firms; insurance companies; professional associations; local, state and federal government; and labor organizations.

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 a minimum of 136 credits, including the following requirements:

1. Complete the writing proficiency requirement. In satisfying this requirement, students may need to complete (with grades of 2.0 or better) RHT 150 and 160 (or their equivalent at another college or university).
2. Meet the university general education requirements (see *Undergraduate degree requirements*). In completing the health science core curriculum, industrial health and safety majors will automatically satisfy the requirement in natural science and technology.
3. Complete the university ethnic diversity requirement. For industrial health and safety majors, this requirement is satisfied by completing the health science core curriculum course HBS 200.
4. Complete the health science core curriculum. The biology sequence of BIO 111, 207 is preferred.
5. Complete BIO 205, CHM 234-235, HS 201, MTH 012 and PHY 158, which complement the core curriculum.

6. Complete the major courses: IHS 300, 305, 306, 315, 316, 319, 403, 430, 433, 470.
7. Complete 15 credits of program elective course work. Program elective courses may not be counted toward both the general education requirements and this requirement.
8. Complete all math and science prerequisite courses within the health science core curriculum and all industrial health and safety required IHS courses with grades of 2.0 or higher.

Industrial health and safety program elective requirement

Industrial health and safety majors must complete 15 credit hours of courses selected to establish special expertise or give greater insight into the various aspects of professional occupational safety and health practice. At least 4 of the following courses must be included: IHS 410, 415, 420, 423, 451, 453, 460, 464. Courses cannot be double counted toward both general education and the program elective requirement. A formal plan of study listing specific courses must be approved by the program director prior to senior status. Early plan approval is recommended. Forms are available from the School of Health Sciences academic adviser.

Minor in industrial health and safety

A minor in industrial health and safety is available to students majoring in other programs, such as environmental health, general studies, engineering, biology or chemistry. Courses required for the minor include: IHS 305, 306, 315, 316, 403 and 9 additional credits in IHS courses.

Grade point policy

Industrial health and safety majors must achieve minimum course grades of 2.0 in science core prerequisite courses and 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 a designated representative to discuss a method of remediation. In most cases, the method of remediation involves repeating the course in which the unsatisfactory grade was earned. See *Repeating courses* for additional information.

Course Offerings

The program offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

IHS 210 Safety and Health at Work (3)
A general introduction to safety and health on the job including injury and illness prevention, emergency response, accident investigation, relevant legislation, and current topics. It is recommended for business, engineering, prelaw, health professions or general studies students. Due to its condensed nature, it may not be used to meet IHS major requirements.

IHS 300 Industrial Experience (1)
Introduces students to various industrial environments through site visits and provides first hand experience of how health and safety professionals function in the workplace.
Prerequisite: HS 201; Corequisite: IHS 305 or 315.

IHS 305 Industrial Environment I: Evaluations (4)
Basic concepts in the recognition, measurement and evaluation of chemical, physical (noise, radiation, extreme thermal conditions, etc.), and biological (blood borne pathogens, allergens, etc.) hazards in the industrial environment.
Prerequisite: CHM 235, PHY 158.

IHS 306 Industrial Environment II: Controls (4)
Principles and practices on the control aspects (engineering, administrative, and personal protection) of chemical, physical and biological hazard in the industrial environment.
Prerequisite: IHS 305.

IHS 315 Industrial Safety I: Engineering and Technology (4)
Safety principles and practices of the industrial environment. Engineering and technical information are discussed.
Prerequisite: HS 201.

IHS 316 Industrial Safety II: Administration and Programs (4)
Management aspects of the industrial environment. Administration techniques, governmental regulations, and programs for health and safety management are discussed.
Prerequisite: IHS 306, 315.

IHS 319 Fire Prevention and Protection (3)
Fundamentals of flame generation and propagation; fire behavior in open and confined spaces; theory of fire fighting methods; fire detection and suppression; property loss control and life safety.
Prerequisite: IHS 305, 315 or permission of instructor.

IHS 403 Industrial Toxicology (3)
Introduction to the basic concepts and techniques of toxicology, with special attention given to the industrial environment. Evaluation of the toxic effects of substances and toxic responses to various substances.
Prerequisite: BIO 207, CHM 235, IHS 306.

IHS 410 Health Care Facility Safety (3)
Critical health care associated risks, such as blood borne diseases, radiation, medical waste handling and back injuries, as well as the general topics of ergonomics, construction, hazardous waste and fire safety as they relate to diverse health care facilities.
Prerequisite: IHS 315 or permission of instructor.

IHS 415 Construction Safety (3)
Construction safety practices and principles with an overview of program development, legislative issues and special concerns of the construction industry with respect to worker safety.
Prerequisite: IHS 315.

IHS 420 Robotic and Automation System Safety (3)
Information and issues related to worker safety in industrial environments where robots are used. The state-of-the-art of advanced automation will be surveyed, with emphasis on system safety and injury prevention features required to assure an adequate worker/robot interface.
Prerequisite: IHS 315.

IHS 423 Radiation Safety (3)
Safety aspects of occupational hazards associated with the use of ionizing radiation in industry. Methods for the identification, evaluation and control of potential worker overexposure conditions will be reviewed. Biological effects of acute and chronic worker exposure will also be reviewed.
Prerequisite: IHS 306, PHY 102, 158 or permission of instructor.

IHS 430 Environmental Standards (3)
Examines air, water, hazardous waste, pesticide and chemical regulatory standards. Topics will be analyzed in terms of standard development, enforcement at state and federal levels, and the validity of the standard's ability to protect health and the environment.
Prerequisite: IHS 306, 315.

IHS 433 Ocupational Safety and Health Services (3)
Current regulations and standards promulgated by the Occupational Safety and Health Administration of the U.S. Department of Labor.
Prerequisite: IHS 306, 315.

IHS 451 Industrial Ventilation (3)
Design and control applications for reducing worker exposure to airborne contaminants. Concepts and principles of dilution and local exhaust ventilation. Methods for assessment of industrial ventilation systems required to prevent the accumulation of flammable or explosive concentrations of gases, vapors or dusts.
Prerequisite: IHS 306, 315, PHY 158.

IHS 453 Industrial Noise Control (3)
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.
Prerequisite: IHS 306, PHY 158.

IHS 460 Introduction to Epidemiology (3)
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: STA 225 or 226.

IHS 464 Introduction to Ergonomics (3)
Ergonomics and related change management concepts; anthropometry, biomechanics, metabolic energy expenditure, capabilities and limitations of workers; design and analysis of the workplace, hand tools, controls and products; application of the NIOSH lifting guidelines and other standards.
Prerequisite: IHS 306, 316; BIO 205; PHY 158.

IHS 470 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: IHS 306, 316, 433 and senior standing.

IHS 480 Special Topics (2, 3, or 4)
May be repeated for additional credit.
Prerequisite: Permission of instructor.

IHS 490 Directed Study in Industrial Health and Safety (1, 2, 3 or 4)
Student initiated and problem-oriented independent study focusing on occupational health and safety issues. May be repeated for additional credit. Graded S/U.
Prerequisite: Program permission.

Medical Laboratory Sciences Program

Director: *Mary Ann Weller*

Professor: *J. Lynne Williams*

Assistant professor: *Mary Ann Weller*

Clinical professors: *John D. Crissman, Howard J. Dworkin, Noel S. Lawson, Joan C. Mattson, Frank A. Vicini*

Clinical associate professors: *Barbara Anderson, Ali-Reza Armin, Raymond E. Karcher, Sudha Kini*

Clinical assistant professors: *Elena I. Dvorin, Rebecca Coapman Hankin, Kenneth J. Levin*

Clinical instructors: *Michele M. Beauvais, Cheryl Culver-Schultz, Susan Dingler, Michele S. Ganske, Vanessa L. Gates, Maria M. Hardy, M. Patricia Harvey, Jack Hill, Margaret M. Kluka, Ross R. Lavoie, Paul M. Leduc II, Vincent A. McCormick, Larry D. Meakem, Elizabeth C. Mele, Paul M. Nuechterlein, Mary L. Premo, John Roberts, Joseph Roszka, Joyce A. Salancy, Laura L. Sykes-Ochs, Carol A. Watkins, Peggy A. Wenk*

The medical laboratory sciences program is designed to prepare students for professional opportunities in a variety of settings. Graduates may find employment in hospital or commercial clinical laboratories, research laboratories or public health facilities. Positions

within biomedical corporations, including research and development, quality assurance, and sales or service may also be prospective sources for employment. Furthermore, because it meets basic academic requirements, the medical laboratory sciences curriculum provides excellent preparation for entry into postbaccalaureate professional programs including medicine, dentistry and osteopathy.

Medical laboratory science is a very diversified field. In response to new technologies, many areas of specialization have evolved within the profession to ensure the expertise of individuals performing the required tasks. The medical laboratory science program at Oakland University addresses several specializations including cytotechnology, histotechnology, medical technology, nuclear medicine technology and radiation therapy technology. As health care professionals, medical laboratory scientists play an integral part in patient care. Some are involved in detection and diagnosis of disease. Others provide therapy to patients. In general, cytotechnologists and histotechnologists are involved in the diagnosis of disease based on alterations in cells or tissues. Medical technologists perform a wide range of diagnostic tests, including chemical, microscopic, bacteriological and immunological procedures used in the diagnosis and study of disease. Nuclear medicine technologists utilize small amounts of radioactive materials for diagnostic evaluation of the anatomic or physiologic conditions of the body and to provide therapy with radioactive sources. Radiation therapists use ionizing radiation in the treatment of cancer.

Generally, employment in a hospital or community clinical laboratory requires certification in a specialization field. Students are eligible to sit for national certification examinations in their specialization upon completion of the appropriate internship at an accredited institution. Professional certification is obtained by successfully passing the examination.

Students may be admitted as medical laboratory science majors directly from high school or by transfer from other colleges or universities. As described below (*Admission to clinical specialization internship*), students have the option of earning the medical laboratory sciences degree by completing a hospital-based clinical specialization internship program during their senior year. Acceptance into these internship programs is competitive and is based on grade point average, personal interview and letters of recommendation. Application for acceptance into a cytotechnology, histotechnology, nuclear medicine technology or radiation therapy internship program is made during the winter semester of the sophomore year. Application for acceptance into a medical technology internship program is made during fall semester of the junior year. The junior year curriculum will vary for students depending on the specialization followed. All students must apply for and be accepted into a specialization choice by the end of the sophomore year regardless of acceptance into an internship program. This acceptance into specialization choice shall define "specialization standing" as far as course prerequisites are concerned.

Students not wishing to pursue professional certification or not accepted by a clinical internship program may complete the medical laboratory sciences degree by following the academic program for the specialization of their choice and substituting adviser-approved electives for the clinical year (internship) course work. Such students will be eligible to apply for clinical internship opportunities either before or after graduation, if desired. However, only those students accepted into the radiation therapy internship program will be allowed to enter the RT junior year curriculum (hospital based program).

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 a minimum of 136 credits, including the following requirements:

1. Complete the writing proficiency requirement. In satisfying this requirement, students may need to complete RHT 150 and 160 (with grades of 2.0 or better), or their equivalents at another college or university. Not all credits associated with these courses will apply to the 136 credits required for the degree.

2. Meet the university general education requirements (see *Undergraduate degree requirements*). In completing the health science core curriculum, medical laboratory sciences majors will automatically satisfy the requirements in mathematics, logic and computer science, and in natural science and technology.
3. Complete the university ethnic diversity requirement. For medical laboratory sciences majors, this requirement is satisfied by completing the health science core curriculum course HBS 200.
4. Complete the health science core curriculum. STA 225 or 226 is required for this major.
5. a. Students in the cytotechnology, histotechnology, medical technology and nuclear medicine technology specializations must complete: BIO 206 or 322; CHM 147-148, CHM 234; MLS 201; and MTH 121 or 141, all of which complement the core curriculum.
   b. Students in the radiation therapy specialization must complete: BIO 205, 206; HBS 450; IHS 353; MLS 201, 210, 370; and MTH 141, all of which complement the core curriculum.
6. Complete the major course requirements specified under one of the five medical laboratory sciences specializations (cytotechnology, histotechnology, medical technology, nuclear medicine technology, or radiation therapy).
7. Complete all medical laboratory sciences major program course work with a cumulative GPA of 2.50 or higher.

Admission to clinical specialization internship

To be accepted in a clinical specialization internship, students must submit a formal application for each program for which they seek consideration. Applications for the cytotechnology, histotechnology, nuclear medicine technology and radiation therapy internship programs are processed in the winter semester of the sophomore year (or following completion of the health science core and core-complement curriculum). Applications for medical technology programs are processed during fall semester of the junior year. It is recommended that students have a 3.00 overall grade point average. Students with lower grade point averages may be admitted provisionally pending satisfactory completion of appropriate fall semester, junior-year course work.

Grade point policy

Students must maintain a cumulative grade point average of 2.50 in all course work applied to the medical laboratory sciences major. Students in a specialization will be placed on probation if they earn a grade less than 2.0 in any course or if their cumulative grade point average in major course work falls below 2.50. Students who earn a second grade less than 2.0 must have their programs reviewed by the faculty to determine remediation or termination from the program.

In order to remove probationary status, students must raise their major grade point average to 2.50 or higher.

Specialization in cytotechnology

Cytotechnologists are trained medical laboratory scientists who detect disease by light microscopic examination of cell samples from all areas of the human body. They are responsible for the collection, preparation and staining of specimens consisting of cells which have been shed, abraded or aspirated from body tissues. Cytotechnologists are able to detect abnormal cells and provide preliminary diagnositc information.

Students may apply for acceptance into the cytotechnology specialization after

completing 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 internship at an approved hospital school of cytotechnology. The internship includes an integrated presentation of didactic material, microscopic study, specimen preparation, clinical observation, cytogenetics, laboratory management and a research project.

The following Detroit area hospitals offer a cytotechnology internship in affiliation with Oakland University: The Detroit Medical Center University Laboratories and Henry Ford Hospital.

Cytotechnology specialization requirements

Students accepted into the cytotechnology specialization must complete the following courses: BIO 205, 305, 306, 307, 325, 341, 393 and 423; MLS 210 and 312; and 24 credits in clinical courses, CT 401 and 402.

Specialization in histotechnology

Histotechnologists perform a variety of diagnostic and research procedures in the anatomic sciences. During the clinical internship, students will learn histologic techniques which involve processing, sectioning and staining of tissue specimens that have been removed from humans or animals by biopsy, surgical procedures or autopsy. Advanced techniques include muscle enzyme histochemistry, electron microscopy, immunofluorescence and immunoenzyme procedures, molecular pathology techniques including in situ hybridization and image analysis, and medical photography. Techniques in education methodology, management, research, technical writing and presentation of scientific information are also included in the curriculum.

Students may apply for acceptance into the histotechnology specialization after completing the health science core curriculum, courses which complement the core curriculum and 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 William Beaumont Hospital School of Histotechnology.

Histotechnology specialization requirements

Students accepted into the histotechnology specialization must complete the following courses: BIO 205, 305, 306, 307, 325, 341, 423; HS 401; IHS 410; MLS 210, 312; and 24 credits in clinical courses, HT 401, 402, 403 and 404.

Specialization in medical technology

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

Students may apply for acceptance into the medical technology specialization after completing the health science core curriculum, courses which complement the core curriculum and university general education requirements. The junior year consists of the prescribed academic program at Oakland University. The senior year consists of a 9- or 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 Medical Center University Laboratories, Detroit; St. John Hospital, Detroit; 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 205, 325 (or CHM 453, 454), 421, 422, 423, 465, 466; MLS 313, 314, 316, 317, 326, 327, 328; and 24 credits in clinical courses, MT 415, 416, 418, 421, 423 and 428, or adviser-approved electives.

Specialization in nuclear medicine technology

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

Students may apply for acceptance into the nuclear medicine technology specialization after completion of the health science core curriculum, courses which complement the core curriculum and 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 an approved hospital school of nuclear medicine.

Nuclear medicine technology specialization requirements

Students accepted for nuclear medicine technology major standing must complete the following courses: BIO 205, 206, 325, 423; HS 331, 401; IHS 423; MLS 210, 312, 326, 328; PHL 318; PHY 158; and 24 credits in clinical courses, NMT 401, 402.

Specialization in radiation therapy

Radiation therapy uses ionizing radiation to treat disease, especially cancer. The radiation therapist has the technical skills to plan, deliver and record a prescribed course of radiation. Their primary responsibility is to implement treatment programs prescribed by a radiation oncologist. Practice of this profession requires good judgment and compassion to provide appropriate therapy.

Students may apply for acceptance into the radiation therapy specialization after completion of the health science core curriculum, the courses that complement the core curriculum, the university general education requirements, and the Allied Health Professions Admission Test. The junior year consists of twelve months (34 credits) of didactic work at William Beaumont Hospital. The senior year consists of twelve months of supervised clinical experience in the Radiation Therapy Department at William Beaumont Hospital.

Radiation therapy specialization requirements

Students accepted into the radiation therapy specialization must complete the following courses; RT 301, 311, 315, 321, 323, 331, 333, 334, 335, 341, 342, 343, 344, and 24 hours in clinical courses, RT 401 and 402.

Course Offerings

The program offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

CYTOTECHNOLOGY

CT 401 Clinical Internship (12)
Microscopic study of cellular alterations indicative of cancer and precancerous lesions, infections, and benign conditions in the female genital tract; introduction to cytopreparatory techniques.
Prerequisite: Program permission.

CT 402 Clinical Internship (12)
Continuation of CT 401; microscopic study of non-gynecologic samples and fine needle aspirations; laboratory rotations; research project.
Prerequisite: Program permission.

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 enzyme histochemical staining methods and their specific applications.
Prerequisite: Program permission.

HT 402 Basic Electron Microscopy (6)
Didactic and practicum experience in basic biological electron microscopy. Electron microscopic histochemistry and special techniques are also covered. Emphasis is on the electron microscope as a medical diagnostic tool.
Prerequisite: Program permission.

HT 403 Immunohisto-cytochemistry (3)
Didactic and practicum experience in basic and advanced procedures of fluorescent and enzyme-labeled antibody techniques. Includes the preparation of tissues, staining with labeled antibodies and the use of the fluorescence microscope in clinical medicine and research.
Prerequisite: Program permission.

HT 404 Special Techniques (3)
Didactic and practicum experience in molecular pathology (in situ hybridization and DNA analysis), management, education methodology, technical writing and research techniques.
Prerequisite: Program permission.

MEDICAL LABORATORY SCIENCES

MLS 201 Careers in Medical Laboratory Sciences (1)
An introductory seminar in medical laboratory sciences, including career opportunities in clinical settings (medical technology, histotechnology, cytotechnology, nuclear medicine technology, industrial sales and/or research and development, basic medical research and education).

MLS 210 Medical Terminology (1)
This course is designed as an independent study using a programmed text. Initial emphasis is on learning Greek and Latin word parts and rules for combining them, with cumulative study directed to the analysis and definition of medical terms. Graded S/U.

MLS 312 Hematology/Cellular Pathophysiology (4)
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 313 Immunohematology (4)
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.

MLS 314 Hemostasis (4)
In depth study of the basic physiology and pathophysiology of the human hemostatic system. Laboratory included.
Prerequisite: BIO 207 or 321; permission of instructor.

MLS 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.

MLS 317 Hematology Laboratory (1)
To accompany MLS 316.
Prerequisite: Permission of instructor.

MLS 326 Instrumentation and Clinical Analysis (3)
An introduction to theoretical and practical aspects of instrumentation and clinical analysis. Includes practical experience in the calibration, operation and preventive maintenance of laboratory instruments. Laboratory included.
Prerequisite: Permission of instructor.

MLS 327 Clinical Chemistry (3)
A theoretical introduction to the fundamentals of clinical chemistry, with emphasis on pathophysiology and clinical correlations.
Prerequisite: BIO 325.

MLS 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 MLS 326 with grade of 2.0 or better.

MLS 370 Computer Applications in Laboratory Medicine (1)
Basic knowledge of computers is presented. Computer hardware components, operations and software are explained in light of applications relevant to laboratory medicine.

MLS 405 Special Topics (1, 2, 3 or 4)
May be repeated for additional credit.
Prerequisite: Permission of instructor.

MLS 451 Clinical Education (6)
Prerequisite: Permission of instructor.

MLS 490 Individual Laboratory Work (2, 3, 4)
May be repeated for additional credit.
Prerequisite: Permission of instructor.

MLS 497 Apprentice College Teaching (2)
Directed teaching of selected undergraduate courses. May be repeated for a maximum of 4 credits. Graded S/U.
Prerequisite: Permission of instructor.

MLS 498 Directed Study (1-4)
Student initiated and problem-oriented directed study focusing on medical laboratory science issues. May be repeated for additional credit.
Prerequisite: Program permission.

MEDICAL TECHNOLOGY

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: Program permission.

MT 416 Clinical Practicum — Hematology (5)
Didactic and practicum experience at an affiliated hospital school of medical technology, in the area of hematology.
Prerequisite: Program permission.

MT 418 Clinical Practicum — Immunohematology (3)
Didactic and practicum experience at an affiliated hospital school of medical technology, in the field of immunohematology.
Prerequisite: Program permission.

MT 421 Clinical Practicum — Microbiology (6)
Didactic and practicum experience at an affiliated hospital school of medical technology, in the field of medical microbiology, including parasitology and mycology.
Prerequisite: Program permission.

MT 423 Clinical Practicum — Serology (1)
Didactic and practicum experience at an affiliated hospital school of medical technology, in the field of serology.
Prerequisite: Program permission.

MT 428 Clinical Practicum — Chemistry (6)
Didactic and practicum experience at an affiliated hospital school of medical technology, in the field of clinical chemistry.
Prerequisite: Program permission.

NUCLEAR MEDICINE TECHNOLOGY

NMT 401 Clinical Internship I (12)
Didactic and clinical experience in clinical nuclear medicine including instrumentation, radiopharmacy, ligand assay, organ imaging and therapy with radionuclides.
Prerequisite: Program permission.

NMT 402 Clinical Internship II (12)
Continuation of NMT 401.
Prerequisite: Program permission.

RADIATION THERAPY

RT 301 Introduction to Radiation Therapy (2)
An introduction to the activities and responsibilities of the radiation therapist including orientation to school and hospital policies, career insights, overview of techniques used in radiation therapy, and essentials of procedures needed in the care of radiation oncology patients. Medical terminology specific to the field is reviewed.
Prerequisite: RT specialization standing.

RT 311 Patient Care and Management (2)
Patient care techniques with emphasis on those necessary in the care and examination of oncology patients, especially those receiving radiation therapy. Psychological considerations, management of emergencies, infection control, examination, medical-surgical asepsis and tube management will be presented.
Prerequisite: RT specialization standing.

RT 315 Seminar in Radiation Oncology (3)
Literature search of faculty approved topics related to radiation oncology with written analysis of case studies on various malignancies. Oral presentation required.
Prerequisite: RT specialization standing.

RT 321 Radiographic Imaging and Anatomy (2)
Fundamentals of radiographic exposure techniques including production of radiation, rectification, quality of radiation and film processing. Topographic and cross-sectional anatomy and identification of anatomic structures as seen by various imaging modalities will be introduced.
Prerequisites: BIO 205 and RT specialization standing.

RT 323 Radiobiology (2)
Biophysical principles of ionizing radiation and effects on living tissue with emphasis on radiosensitivity and response to radiation, including a review of cell biology. An introduction to hyperthermia as a treatment modality illustrating the cellular response to heat, methods of heating and interactions of heat and radiation.
Prerequisite: RT 331 and RT specialization standing.

RT 331 Radiation Physics (3)
Fundamental principles of atomic structure and matter, production and properties of radiation, interactions of photons, particulate radiation, measurements of radiation and measurement of absorbed dose are covered. Discussions will include different radiation therapy treatment units.
Prerequisite: PHY 102 and RT specialization standing.

RT 333 Clinical Dosimetry (3)
Basic concepts of clinical dosimetry including use of isodose charts, treatment planning, field defining apparatus and wedges. Different methods of dosimetric calculations are described. Emphasis is on conformal therapy, MLC dosimetry and three dimensional treatment planning.
Prerequisite: RT 331 and RT specialization standing.

RT 334 Brachytherapy and Radiation Protection (3)
Principles of radiation safety including need for radiation protection, detection and measurement of radiation, regulatory agencies and regulations, personnel monitoring and practical radiation protection are presented. Also includes types and storage of brachytherapy sources, use and care of applicators, leak testing and surveys and accident procedures.
Prerequisite: RT specialization standing.

RT 335 Quality Assurance (3)
Principles and applications of a comprehensive quality assurance program in radiation therapy. Topics include relevant tasks, frequency of performance and acceptable limits. Laboratory exercises included.
Prerequisite: RT specialization standing.

RT 341 Oncologic Pathology (3)
Disease concepts including: inflammatory process, neoplasia, types of growth, causative factors, behavior of tumors and staging procedures. Tumors originating from specific sites and respective pathology will be discussed.
Prerequisite: BIO 207 and RT specialization standing.

RT 342 Technical Radiation Oncology I (3)
Provides an understanding of radiation therapy equipment including techniques used in treatment delivery. Tumor localization utilizing simulators, beam directing devices and other technical considerations involved are presented. The role of the radiation therapist in disease management will be discussed.
Prerequisite: PHY 102, BIO 205 and 207, RT specialization standing.

RT 343 Technical Radiation Oncology II (3)
Continuation of Technical Radiation Oncology I.
Prerequisite: RT 342 and RT specialization standing.

RT 344 Clinical Radiation Oncology (2)
An overview of radiation oncology and its role in medicine as compared with surgery and chemotherapy as treatment modalities. Discussion of tumors including locations, etiology, detection, staging and grading, and treatment. Oncologic emergencies are presented.

RT 401 Clinical Practicum I (12)
Supervised experience in the practice of radiation therapy technology. The student therapist will observe and participate in simulation procedures and delivery of radiation treatment to actual patients in the Radiation Oncology Department of William Beaumont Hospital. Patient care and management will be covered.
Prerequisite: Program permission.

RT 402 Clinical Practicum II (12)
Continued supervised experience in simulation procedures and treatment delivery to actual patients. Treatment planning, brachytherapy and submission of quality assurance reports are emphasized.
Prerequisite: Program permission.

Physical Therapy Program

Director: *Beth C. Marcoux*

Associate professor: *Beth C. Marcoux*

Special instructors: *Christine Stiller Sermo, Kristine A. Thompson*

Visiting assistant professor: *Faye M. Cobb*

Visiting instructors: *John R. Krauss, Cathy A. Larson*

Clinical professors: *Louis R. Amundsen, A. Charles Dorando*

Consulting professor: *Olaf Evjenth*

Clinical associate professor: *Jane M. Walter*

Clinical assistant professors: *Frank C. Kava, Kristie S. Kava, Pamela Lemerand, Gretchen D. Reeves, Bjorn W. Svendsen*

Consulting assistant professor: *Lasse Thue*

Senior clinical instructors: *Mary S. Lundy, Martha Schiller*

Clinical instructors: *Lezlie Adler, Reyna T. Blumentritt, Henry D. Boutros, Douglas S. Creighton, Edward J. Czarnecki, Paula Denison, Jacquelin Drouin, Linda F. Erickson, David K. Gilboe, Dorothy J. Indish, Pamela S. Knickerbocker, Kathleen Jakubiak Kovacek, Peter R. Kovacek, Rick Orlandoni, Jeffrey Placzek, Frederick D. Pociask, Geraldine A. Pollock, Marilyn J. Raymond, Helene M. Rosen, Wendy Rzeppa, Daniel A. Selahowski, Heidi Sinz, Angela C. Strong, Anne E. Tafelski, Jody L. Tomasic, David A. Tomsich, James E. Traylor, Gloria J. Verhaeghe, Kenneth M. Woodward*

General information

The physical therapy program prepares students for the master of physical therapy degree and professional careers in physical therapy. The program builds upon the liberal arts, reinforcing the role of the physical therapist as an actively contributing member of society and a rational and morally sensitive professional. The program is accredited by the Commission on Physical Therapy Education.

Physical therapists are concerned with the prevention and treatment of acute and chronic conditions that cause disorders of movement. Physical therapists evaluate the musculoskeletal, neuromuscular, cardiopulmonary and associated systems, drawing on the basic sciences (biology, chemistry and physics) and the behavioral sciences (psychology) for their interpretations. Patient programs are then developed to resolve movement dysfunctions. Physical therapists work in concert with all members of the health care team through a variety of referral relationships.

Admission to major standing

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 and rhetoric requirements. Acceptance is based on academic performance, letters of recommendation, exposure to the profession and a personal interview. A minimum grade of 2.0 is required in each of the health science core curriculum courses and the science, math and psychology courses that complement the core curriculum (see *Requirements for the B.S. degree with a major in health sciences*, items 4 and 5). Students seeking admission to the professional program must submit an *Application for Admission to the Physical Therapy Program*. Applications are accepted from Oakland University students and students transferring from other institutions. These application forms are available from the physical therapy office (121 Vandenberg Hall) from October 15 to December 20 each year for consideration for admission to the program the following spring semester. Students submit these application materials directly to the physical therapy office. The deadline for this application is January 5 and there is an application fee for this process. Transfer students must simultaneously apply to the university admissions office for acceptance to the university. Transfer students must demonstrate completion of a preprofessional curriculum equivalent to Oakland University's in terms of both content and semester hour total (81 semester hour credits). Transfer students are reminded that a maximum of 70 semester hour credits are transferable from a community or junior college (see *Transfer student information*). Preference will be given to students who have completed a majority of their credits at Oakland University.

The preprofessional course requirements are subject to modification. Students are advised to see their academic adviser periodically to insure the completion of the appropriate course work for admission to the physical therapy major program.

Program description

Students accepted into the physical therapy professional program are required to complete the Bachelor of Science in health sciences degree with a focus in physical therapy (see *Health Sciences Program*), followed by a graduate level curriculum that culminates in the awarding of the Master of Physical Therapy degree. The Bachelor of Science in health sciences is awarded when a minimum of 140 semester hours have been earned. This degree is a reflection of academic achievement but does not allow the student to practice physical therapy. The Master of Physical Therapy is awarded upon completion of a minimum of 47 additional semester hours of graduate level course work. This degree allows the graduate to apply to sit for the professional licensure examination. The duration of the professional program is three years for full-time students. Students who already hold a bachelor's degree are not required to earn a second degree. However, such students must still complete the preprofessional core requirements prior to admission to the professional program and all professional course requirements prior to receiving the master's degree.

A description of the 47 semester hours of graduate level course work required to complete the physical therapy program and earn the Master of Physical Therapy degree is provided in the *Oakland University Graduate Catalog*.

Requirements for the B.S. degree in health sciences with a focus in physical therapy

See *Requirements for the B.S. degree with a major in health sciences and physical therapy academic focus course requirements*. The information contained in those sections is repeated here with specific reference to physical therapy academic focus requirements only:

1. Complete the writing proficiency requirement. In satisfying this requirement, students may need to complete RHT 150 and RHT 160 (with grades of 2.0 or better) or their equivalent at another college or university. Not all credits associated with these courses will apply to the 140 credits required for this degree.
2. Meet the university general education requirements (see *Undergraduate degree requirements*). In completing the health science core curriculum and major program requirements, physical therapy majors will automatically satisfy the requirements in mathematics, logic and computer science, in natural science and technology, and in social science.
3. Complete the university ethnic diversity requirement. For health sciences majors, this requirement is satisfied by completing the health science core curriculum course HBS 200.
4. Complete the health science core curriculum. (See *Health Science Core Curriculum.)*
5. Complete BIO 206 or 322; EXS 304; HS 331 and 401; MTH 141; PHY 158; PSY 100 or 130, and PSY 225 or 321 or 323, all of which complement the core curriculum.
6. Be admitted to major standing in the professional program.
7. Complete the major program as follows: BIO 381 and 460; PT 300, 301, 311, 324, 330, 331, 332, 333, 334, 351, 370, 420, 442, 452, 460, 470 and 488.

Grade point policy

A 3.00 grade point average for all course work taken in the professional program is required for graduation. Progress toward this requirement during the three-year professional program will be monitored, with probation, suspension or dismissal from the program as possible consequences of not meeting the following criteria:

1. A minimum semester GPA of 2.70 must be achieved for each and every semester enrolled in the program. Students receiving a semester GPA of less than 2.70 during enrollment in the program will be placed on probation. For purposes of this policy, the spring/summer terms of the first year will count as one semester. Students receiving a semester GPA of less than 2.70 more than once during enrollment in the professional program are subject to suspension from the program for a period of one year.
2. A minimum course grade of 2.0 must be achieved for each required course in the program. Students receiving one course grade below 2.0 during any semester are subject to probation or suspension from the program. Suspension involves temporary ineligibility to take additional major course work until such time as each course completed unsatisfactorily or its equivalent is again offered and satisfactorily completed. This period is typically one year.
3. Students are subject to dismissal from the program as a result of any one of the following conditions: receipt of two course grades below 2.0 during completion of the professional program, being subject to probation more than twice or to suspension more than once. Once dismissed, students may not re-enter the physical therapy program.
4. Students will be informed of all probation, suspension and dismissal decisions in writing, including the grounds for the decision, a time frame for probation/suspension, and any remedial work or repeat course work that must be completed prior to continuing in the program.
5. All decisions regarding the imposition of probation, suspension or dismissal, any remedial work to be completed and the removal of probation or suspension will be made by the Physical Therapy Honors and Promotion Committee. Appeals of Physical Therapy

Honors and Promotion Committee decisions may be made to the dean of the School of Health Sciences. The dean's decision shall be final. For additional information on general university policies on repeats, see *Repeating courses*.

Code of ethics

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

Course Offerings

The program offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*. Major standing in Physical Therapy is prerequisite to all courses in PT.

PT 300 Kinesiology (4)
Study of selected anatomical, structural and functional properties of human muscular, skeletal and connective tissue structure. Normal human movement is emphasized to develop a base of knowledge for clinical assessment and treatment. Laboratories in surface anatomy and gait analysis are included. Abnormalities and physical dysfunctions are discussed on a limited basis.

PT 301 Introduction to Physical Therapy (2)
Orientation to the profession of physical therapy including concepts related to disability and rehabilitation. Characteristics of the profession and the professional expectations for practitioners will be introduced.

PT 311 Biomechanics (3)
The study of mechanical principles of human movement and its analysis. Anthropometry, muscle mechanics, mechanics of materials and coordination are studied. Instrumentation for kinetic and kinematic evaluation of human motion are presented. Advanced gait analysis is included.

PT 321 Basic Athletic Training (2)
Course directed to competitive sports and the recognition and immediate care of athletic injuries. Evaluative and treatment procedures and techniques are presented and practiced. Identical with EXS 321.
Prerequisite: BIO 205, BIO 207, EXS 350 or PT 300.

PT 324 Application of Teaching and Learning in Physical Therapy (2)
Child, adolescent and adult/older adult learning theory as it relates to patient interaction in physical therapy.
Prerequisite: Major standing or permission of instructor.

PT 330 Introduction to Patient Management (3)
Theory and practice of basic therapeutic techniques utilized in physical therapy. Modules include: professional orientation, patient records, gait training, transfer training, wheelchair management, assistive device prescription, range of motion, history taking and massage. All of these aspects will be integrated into a problem solving/case study approach.

PT 331 Examination and Evaluation Procedures I (3)
Basic principles and techniques of evaluation procedures used in physical therapy. Lecture, laboratory, demonstration, discussion and clinical site visits will be used to teach students principles and techniques of palpation, manual muscle testing, goniometry, anthropometric measurement, posture and gait analysis, and vital signs.

PT 332 Physical Agents (3)
Lecture/laboratory focusing on the principles and procedures for using physical agents. Modules focus on superficial and deep heat, cryotherapy, infrared, ultraviolet, hydrotherapy, compression garments and traction.

PT 333 Clinical Medicine and Physical Therapy (4)
Lecture/discussion covering the etiology, pathology, symptomatology, treatment and prognosis of patient disorders associated with the medical specialty areas covered in this course, which include: cardiopulmonary, oncology, burn care, orthopedics, rheumatology and neuromuscular diseases.

PT 334 Examination and Evaluation Procedures II (4)
Study of basic evaluation principles and procedures for the patient with musculoskeletal and neuromuscular problems.

PT 351 Clinical Education I (3)
Orientation to clinical practice including the use of basic evaluation and treatment skills through a supervised clinical experience in a clinical setting. Students will have didactic and clinical experiences.

PT 370 Therapeutic Exercise I (2)
Introduction to principles and techniques of therapeutic exercise. Students will begin to formulate treatment programs to resolve patient problems and foster awareness of the ramifications of these procedures on the client and his/her life.

PT 420 Neurophysiology and Clinical Neuroscience (3)
Integration of neuroanatomy and neurophysiology as it forms a rationale for patient evaluation and treatment planning. Special emphasis is given to neurophysiology/neuroanatomy rationale related to neuromuscular and skeletal dysfunctions. Lecture, laboratory and practical experiences.

PT 442 Emotional Aspects of Disability (3)
Study of the various factors impinging upon the patient, the family or meaningful others, other members of the medical team and ultimately the patient-therapist relationship, and what the physical therapist needs to consider when interacting with the patient or family or meaningful others.

PT 452 Clinical Education II (3)
Clinical education including advanced patient evaluation and initiation of treatment planning and implementation under direct supervision in the clinical environment.

PT 460 Physical Therapy and the Human Life Cycle I: Infancy through Adolescence (3)
Examines the human developmental progression from conception up to and including adolescence and the special physical therapy adaptations that are required at each stage of development. Course format is varied with discussion, demonstration, lectures, small group activities, field observations and patient assessment.

PT 470 Therapeutic Exercise II (3)
Advanced exercise techniques. Students will critique and alter rehabilitation protocols based on their understanding of biomechanics and function. Students will take an active role in the creation of therapeutic exercise and the analysis of traditional exercise strategies.

PT 488 Research I (3)
Preparation for the professional physical therapist to be a knowledgeable research consumer. The student will develop a research proposal around a topic of special interest related to physical therapy. Topics include the critical components of a research paper, principles of measurement theory inherent in all research design and statistical analyses.

PT 490 Directed Study (1, 2, 3 or 4)
Student initiated and problem-oriented directed study focusing on physical therapy issues. May be repeated for additional credit. Graded numerically or S/U.
Prerequisite: Program permission.

HONORS COLLEGE

112 VANDENBERG HALL (248) 370-4450

Director: *Brian F. Murphy (English)*

Council: *Hoda S. Abdel-Aty-Zohdy (School of Engineering and Computer Science), Kevin E. Early (Sociology), Kevin J. Murphy (Economics), Gary Shepherd (Sociology), Sally M. Silk (Modern Languages and Literatures), Barry S. Winkler (Biomedical Sciences), two sophomores, two juniors and two senior Honors College students.*

The Honors College was established for highly motivated students seeking a rich, valuable and 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 Education and Human Services, the School of Engineering and Computer Science, the School of Health Sciences or the School of Nursing.

A student who is not pursuing a standard major (for example, a student with an independent major) may be accepted to the Honors College if the Honors College Council determines that the student's program is of sufficient breadth, depth and coherence.

General education requirements of the Honors College

1. The student must successfully complete RHT 160 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 general education and college distribution requirements. Students are not required 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. A student who is granted conditional advanced standing will be given reasons for this status.

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

The Honors College offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

HC 201-208 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 300 Special Topics (2, 4)
Special problems and topics selected by the instructor.
Prerequisite: Open to Honors College students only.

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.

SCHOOL OF NURSING

428-434 O'DOWD HALL
(248) 370-4070
Fax: (248) 370-4279

Dean: *Justine J. Speer*

Associate Dean: *Diane R. Wilson*

Assistant Deans: *Dorothy H. Fox, Teresa Wehrwein*

Office of the Dean: *Sherry Abernathy, assistant to the dean; Patricia T. Ketcham, learning resource laboratory manager; Sue Lindberg, academic advising coordinator; Pamela A. Marin, Director, Center for Professional Development*

Professor: *Justine J. Speer*

Associate professors: *Frances C. Jackson, Anahid Kulwicki, Mary E. Mittelstaedt, Gary Moore, F. Darlene Schott-Baer, Carol S. Zenas*

Assistant professors: *June E. Miller, Sarah E. Newton, Christina L. Sieloff, Catherine V.H. Vincent, Diane R. Wilson*

Special instructor: *Ramune Mikaila*

Visiting instructors: *Evelyn M. Clingerman, Sara R. Hinderer, Judith K. Hovey, Barbara B. Penprase, Mary Janet Shinske, Debbie L. Simmons, and Laureen H. Smith,*

Lecturers: *Roy Aston, Peter Duno, Sandra Elliot, Donald M. Fill, Carol Glush, Carol S. Gorelick, Sharon Heskitt, Kathleen Larkin, Claire A. Michelini, Morris Magnan, Howard J. Normile, Martha Sturgeon, Darlene Zoilkowski,*

Applied nursing instructors: *Phyllis Andras, Hala Elian, Karen Jansen, Alice Schneider*

Adjunct assistant professors: *Patricia T. Ketcham, Therese M. Pilchak, Karen Zaglaniczny, Christine S. Zambricki*

Adjunct instructors: *Lisa Ann Mileto*

Board of Visitors

The Board of Visitors for the School of Nursing is composed of community leaders in the greater Detroit area. It assists the school in developing goals and objectives, curricular design, as well as clinical and research programs that meet the rapidly changing requirements of the health care field. Board members consult on such matters as facilities, equipment requirements, special topics and long-range planning.

Members of the Board of Visitors are:

Maggie Allesee, Counselor, Birmingham, Michigan
John C. Avery, Branch Manager and Managing Member, Roney & Co.
Ernest W. Baker, Executive Vice President, BBDO Advertising
Donald J. Bortz, Jr., President, Bortz Health Care Corporation
Julius V. Combs, M.D., Chairman and CEO, United American Health Care
Charles Crissman, Chairman and CEO, Crissman Enterprises, Ltd.
Lisa DeMoss, Vice President and Deputy General Counsel, Blue Cross Blue Shield of Michigan
Mary Foulie, Senior Vice President, Standard Federal Bank
Ronald E. Garbinski, President, Waterloo Group
Lorraine Headley, Associate Hospital Director, Beaumont Hospital - Troy
Frank W. Jackson III, Director, Employee Relations Law, Blue Cross Blue Shield of Michigan

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Marilyn Messina, Associate Hospital Director, Beaumont Hospital - Royal Oak
Janet B. Ofodile, President & CEO, Blue Care Network
Ronald J. Palmer, Executive Vice President, Standard Federal Bank
Jane Royer, Citizen
Boris G. Sellers, President, The Beaumont Foundation
Linda Truxell, Attorney at Law
Peter Wozniak, Vice President, Patient Care Services, Mt. Clemens General Hospital

Programs Offered

Undergraduate program

The School of Nursing offers instruction leading to the Bachelor of Science in Nursing (B.S.N.). The course of study combines general education in the humanities and the social, biological and natural sciences with education in the theory and practice of nursing. Graduates are eligible to take the state registered nurse licensure examination. Full and part-time program sequences are provided for registered nurses who wish to earn the B.S.N.

The objectives of the program are to prepare nurse leaders who:

1. As nurse generalists, provide care for well, acutely ill, chronically ill, and dying clients across the life span in a variety of traditional and nontraditional settings
2. Demonstrate competency in:
   a. the assessment of individuals, families, and communities/aggregates
   b. clinical decision making and problem solving
   c. interpersonal, cross-cultural, and technological communication
   d. health teaching
   e. designing, delivering, directing, and evaluating quality health care
3. Work to improve the health care systems through which care is provided and influence the health policies which support them.

Graduate program

The School of Nursing offers a program leading to the Master of Science in Nursing (M.S.N.). This program prepares nurses for advanced nursing practice in adult health clinical nurse specialist - case management of populations, nurse practitioner, or nurse anesthesia. A post-master's specialization in family nurse practitioner is also offered. For more information, see the *Oakland University Graduate Catalog*.

Admission

The prenursing year

Students wishing to enter prenursing should have completed two years of high school mathematics, including algebra, one year of college preparatory biology, and one year of chemistry, with a grade of 2.8 or better in each. A cumulative average of 2.80 or better is required for admission to the prenursing program at Oakland University. See the sections on admission to the School of Nursing below and *Admissions* section of this catalog for additional information.

Admission to the School of Nursing

During the prenursing year, students take introductory courses in the natural and social

sciences and the humanities. Application for admission to the nursing program occurs during the winter semester. The student must be in good standing in the university (minimum overall grade point average of 2.00). Completion of minimum requirements does not guarantee admission. Positions are filled with applicants best qualified to succeed in the nursing program. Preference is given to students who have completed a majority of their fall and winter prenursing courses at Oakland University. The School of Nursing encourages and actively seeks male and minority applicants. Individuals with disabilities will be considered for admission to the School of Nursing on an individual basis related to their ability to complete the program, including clinical practice requirements and the provisions of safe patient care, with or without reasonable accommodations.

To be considered for admission to the sophomore year of the nursing program, students must:

1. Complete BIO 111, 121; CHM 104, 201; RHT 150, 160; and PSY 100 or 130, with a minimum grade point average of 3.00 and earn a minimum grade of 2.0 in each course by the end of winter semester in the year of application to the nursing program.

2. Complete PHL 101, 102 or 103 with a minimum grade of 2.0 by the end of the winter semester in the year of application to the nursing program.

3. Complete MTH 011 with a minimum grade of 2.0. (This requirement is waived for students who receive a score of 18 or higher on the mathematics portion of the American College Test (ACT)). This requirement must be satisfied by the end of winter semester in the year of application to the nursing program. Credits for MTH 011 do not apply to any degree at Oakland University.

4. Complete BIO 307 with a minimum grade of 2.0 and NRS 200 with a minimum grade of 2.5 in the theory and lab components. BIO 307 and NRS 200 must be completed during spring/summer of the prenursing year.

In addition, admission to the nursing program beginning in the sophomore year is contingent upon meeting all health, liability insurance, and CPR requirements. Specific details will be provided with the letter of admission. Requirements include:

1. Submission of a completed health history and physical examination, including inoculation for tetanus, skin testing for tuberculosis (possible chest x-ray), proof of immunity to rubella, rubeloa, mumps, and varicella, Hepatitis B vaccination and correction of any correctable physical limitations

2. School programs have clinical/field, laboratory and internship components that require physical, cognitive, and psycho-social technical standards be met. Students with disabilities who have questions about their ability to meet these standards are encouraged to contact the Office of Disability Support Services, 157 North Foundation Hall (370-3266).

3. Obtaining malpractice insurance coverage of at least $1,000,000 per occurrence/ $3,000,000 aggregate for the sophomore, junior and senior years

4. Completion of an approved CPR course.

Students are responsible for any costs associated with the requirements described above.

Students accepted to the nursing program must submit proof of all the above requirements no later than August 1 of the year of acceptance. All requirements must remain in effect throughout the academic year. Failure to provide necessary documentation by August 1 will result in cancellation of admission. It is important that students maintain their own health insurance for illness or injury. Clinical agencies are not required to provide free treatment for students and will bill individuals for use of their emergency or employee health services.

Once admitted to the nursing program, students should consult the School of Nursing Undergraduate Student Handbook for detailed information on program policies and procedures.

Advising

The School of Nursing advising office is located in 449 O'Dowd Hall (370-4253). All students should schedule an advising appointment during the prenursing year to review degree requirements. In addition, students are required to attend a School of Nursing orientation prior to registration for nursing courses. A plan of study for each student is completed at the orientation. The plan of study is a timetable of courses to be taken and assures progress toward satisfying degree requirements.

Transfer policy

Programs offered by the School of Nursing are designed to meet National League for Nursing and Commission on Collegiate Nursing Education (CCNE) accreditation criteria as well as to reflect the Oakland University philosophy of education. 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. See *Transfer student information* for additional information about university transfer policy, including transfer of credit from community colleges.

Requirements for the Bachelor of Science in Nursing degree

To earn the Bachelor of Science in Nursing degree, students must complete a minimum of 125 credits and meet the following requirements:

1. Complete the writing proficiency requirement
2. Complete the university ethnic diversity requirement
3. Complete all credits and courses prescribed in the degree curriculum, including: 32 credits in general education (see *Undergraduate degree requirements*), 64 credits in the nursing component, and 21 credits in the humanities and the social science and natural sciences as prescribed by the School of Nursing
4. Maintain a cumulative grade point average of at least 2.50 in all nursing courses
5. Complete at least 32 credits at the 300-level or above.

Standard Program Plan

Fall

Prenursing		
*CHM 104	Introduction to Chemical Principles	(4)
*BIO 111	Biology	(4)
*RHT 150	Compostition I	(4)
*PSY 100	Foundations of Contemporary Psychology	
	or	
PSY 130	Psychology & Society	(4)

Winter

Prenursing		
*CHM 201	Organic and Biological Chemistry	(4)
*BIO 121	Clinical Anatomy and Physiology	(5)
*RHT 160	Compostition II	(4)
PHL 101 or 102 or 103 (select one)		(4)

Spring/Summer

Prenursing	NRS 200	Nursing Therapeutics I	(2)
	BIO 307	Human Microbiology	(4)

Fall

Sophomore		
NRS 201	Health Assessment I	(2)
NRS 203	Nursing Therapeutics II	(1)
NRS 224	Health Promotion I	(5)
NRS 240	Health Education	(2)
NRS 252	Scientific Inquiry I	(2)
PSY 225	Introduction to Life-Span Developmental Psychology	(4)

Winter

Sophomore		
NRS 204	Nursing Therapeutics III	(1)
NRS 220	Nutrition	(2)
NRS 226	Health Promotion II	(5)
NRS 228	Pharmacology in Professional Nursing	(3)
General Education		(4)

Fall

Junior		
NRS 301	Health Assessment II	(2)
NRS 320	Pathophysiology	(3)
NRS 326	Caring for the Acutely Ill -1	(6)
NRS 352	Home Care	(2)
General Education		(4)

Winter

Junior		
NRS 328	Caring for the Acutely Ill II	(6)
NRS 348	Behavioral Response to Illness	(2)
NRS 354	Nursing Care Management	(2)
General Education		(4)

Fall

Senior		
NRS 424	Caring for the Chronically Ill	(6)
NRS 446	Vulnerable Groups	(2)
General Education		(4)

Winter

Senior		
NRS 452	Scientific Inquiry II	(2)
NRS 472	Professional Nursing Synthesis	(6)
General Education		(4)

Total: 125 credits

NOTE: Completion of MTH 011 with a minimum grade of 2.0 is required for admission to the School of Nursing. This requirement is waived for students who receive a score of 18 or higher on the mathematics portion of the American College Test (ACT). Credits for MTH 011 do not apply to any degree at Oakland University.

*Courses used in the calculation of the prenursing grade point average.

Annual requirements

The requirements listed below must be renewed annually and remain in effect throughout the academic year. By August 1 each year, students in the nursing program must supply written validation of:

1. Skin testing for tuberculosis and/or chest x-ray
2. Malpractice insurance coverage of at least $1,000,000 per occurrence/$3,000,000 aggregate
3. Completion of an approved CPR course.

Students are responsible for any costs associated with the requirements described above. Students who have not submitted all of the above items prior to the deadline will be excluded from clinical agencies and laboratory experiences.

Course sequencing

The nursing curriculum is developed based upon full-time study. Students who complete non-nursing courses prior to entering the program may have a lighter course load but will not complete the program earlier.

Students must complete all designated course requirements for each year in the nursing program before progressing to the next level. Students who are ineligible to progress are placed on inactive status. Students may maintain inactive status in the School of Nursing for one year. 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 in effect when they return.

Field placements

Nursing students are placed in a variety of settings throughout their academic program. These practical experiences provide students with opportunities to apply theory to practice in caring for individuals, families or groups. The School of Nursing attempts to give students a diverse range of experiences.

Cooperating agencies are located in both urban and suburban settings throughout metropolitan Detroit and southeastern Michigan. Each student is responsible for providing his or her own transportation for all field experiences.

Policies and Procedures for Progression, Retention and Dismissal

Students are expected to earn a grade of 2.5 or better in each nursing course or component (theory, clinical, or lab) and a grade of 2.0 or better in each required non-nursing course in the B.S.N. program. In courses graded satisfactory/unsatisfactory (S/U), students are expected to earn a course or component grade of satisfactory. No nursing or required non-nursing course may be repeated more than once. Students are expected to maintain a cumulative GPA of at least 2.50 in all nursing courses. Students who do not meet these standards will have their academic progress reviewed by the associate dean or designee.

Students who are not making satisfactory progress in the program may be placed on probation with conditions imposed for retention in the program or may be dismissed from the program.

Probation and dismissal policies

1. **Probation:** A B.S.N. student will be placed on probation if the student receives a nursing course or component (theory, clinical, or lab) grade below 2.5 or unsatisfactory if graded S/U. Upon receipt of written notification of being placed on probation, the student is required to meet with the associate dean or designee to discuss the conditions of probation. The conditions of probation will include:
   a. repeating a course if course or component grade is below 2.0 or unsatisfactory, or remediating deficiencies if the course or component grade is between 2.0 and 2.49
   b. achieving or maintaining a cumulative GPA of 2.50 in nursing courses within two semesters of being placed on probation, and
   c. receipt of no other nursing course or component grade below 2.5 or unsatisfactory.
2. **Removal from probation:** Upon completion of program requirements, the probationary status will be removed. Written notification of removal of probation will be sent to the student by the associate dean or designee.
3. **Dismissal:** A student will be dismissed from the program if the student:
   a. receives two nursing course or component grades below 2.5 or unsatisfactory in one semester or term
   b. fails to fulfill the conditions of probation, or
   c. receives a second nursing course or component grade below 2.5 or unsatisfactory during completion of the program.

Further, a student may be immediately dismissed from the program for unsafe behavior in any clinical practice setting.

Readmission policy

Readmission, while not encouraged, will be considered on a case-by-case basis. Students may not reapply to the nursing program for one academic year following dismissal.

Degree completion sequence for registered nurses

The degree completion sequence for registered nurses is currently under review. Prospective students should contact the School of Nursing Advising Office for further information.

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 the same for basic and registered nurse students. However, flexible teaching methodologies take into account the professional and life experiences of R.N. students. The first course in the nursing sequence is a transition course, specifically designed for registered nurses.

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. A cumulative grade point average of 2.50 or better is required for admission to the R.N./B.S.N. degree completion sequence.

Registered nurses who enter the university under pre-R.N./B.S.N. status with a grade point average below 2.50 may change to R.N./B.S.N. status upon completion of a minimum of 12 credits (applicable to the nursing program) at Oakland University with a GPA of 2.50 or higher. Registered nurses must complete all credits and/or courses in the degree program.

Completion may be achieved in several ways, including:

1. Transfer of credits. The School of Nursing evaluates previous course work to determine equivalency.
2. National League for Nursing Mobility Profile II examinations, ACT Proficiency Examination Program (PEP) credit and CLEP (College Level Examination Program) credit. Academic credit may be granted in courses for what students know, regardless of where or how they acquired the knowledge, by passing approved examinations, except as noted in 3 below.
3. Required course enrollment. When course requirements cannot be fulfilled by the above methods, R.N. students must enroll in and successfully complete courses. All R.N. students are required to enroll in several specified nursing courses.

This course of study is designed to allow students to proceed at their own pace.

Additional Information

Accreditation and program review

The Oakland University School of Nursing is accredited by the National League for Nursing and has approval from the Michigan State Board of Nursing.

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 and evidence of professional leadership potential.

Student Nurses Association of Oakland University

Prenursing and nursing students are eligible and encouraged to become members of the Student Nurses Association of Oakland University. SNAOU is the mechanism through which students participate in planning and formulating policies related to the School of Nursing.

Qualification for R.N. licensure

Licensure is granted by the state of Michigan. Requirements for licensure include successful completion of a state-approved educational program and 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.

As part of the pre-licensure screening policy, the Michigan Board of Nursing will obtain conviction criminal history. Additionally, new licensure applicants with previous substance abuse convictions will not be prohibited from licensure; however, the circumstances of the conviction will be reviewed and may result in investigation and/or referral to the Health Professional Recovery Program (Legal and Professional Regulation of Nursing Practice in Michigan, 1995).

Continuing Education

Continuing professional education is offered by the School of Nursing Center for Professional Development in order to meet the life-long learning needs of professional nurses. Selected courses will also be approved for nursing continuing education as required by the Michigan Board of Nursing for relicensure.

Specialized contract programs can also be provided in order to meet the unique professional staff development needs of employers in the health care setting, business and industry,

government, and other settings. These programs are individually tailored to meet the specific workplace needs of professionals and employers.

Programs and courses are offered both for university credit or noncredit. When noncredit programs and courses are offered, they carry the Continuing Education Unit (CEU).

Course Offerings

Nursing courses may include student learning experiences in the classroom, learning resource laboratory and clinical practice field experience. Theory, clinical and laboratory course components are graded separately. Admission to the nursing program is required for enrollment in any required nursing course **except NRS 200.**

The School of Nursing offers selected courses from this catalog as warranted by student needs and availability of faculty. Specific offerings for each term may be found in the *Schedule of Classes*.

NRS 200 Nursing Therapeutics I: Theory (1), Laboratory (1)
Introduction to the basic therapeutic skills of professional nursing practice. Includes skills such as vital signs, universal precautions, and CPR.
Prerequisite: School of Nursing permission.

NRS 201 Health Assessment I: Theory (1), Laboratory (1)
Introduces students to the process of health assessment. Emphasis on performing a full screening assessment of well clients across the life span.
Prerequisite: Admission to the School of Nursing, NRS 200 and BIO 307.
Corequisite: NRS 203, 224 or 226, 252.

NRS 203, 204 Nursing Therapeutics II and III (1 each)
Focuses on acquisition of basic and advanced therapeutic skills related to acute and chronically ill clients.
Prerequisite: Admission to the School of Nursing, NRS 200 and BIO 307.
Corequisite: NRS 201, 220, 224 or 226, 228, 240, 252.

NRS 205 Health Assessment: Theory (1), Laboratory (1)
Introduces students to the process of health assessment. Emphasis is on multidimensional assessment and techniques for communicating collected data to other health personnel.
Prerequisite: Admission to RN/BSN degree completion sequence.

NRS 220 Nutrition (2)
Focuses on the knowledge and skills necessary to detemine nutritional needs, status, and habits throughout the life span and health-illness continuum.
Prerequisite: Admission to the School of Nursing or permission of instructor.

NRS 222 Transition to Professional Nursing (3)
Introduces framework of nursing curriculum, including the concepts of human being, environment, health and nursing. Opportunity for the demonstration of clinical competency. For registered nurses only.
Prerequisite: Admission to R.N./B.S.N. degree completion sequence.

NRS 224-226 Health Promotion I and II: Theory (3), Clinical (2), (5 each)
Focuses on health promotion and wellness. A two-course sequence with one semester emphasizing wellness from prenatal period through adolescence, and the other semester emphasizing adulthood through senescence. Students will have field experiences in a variety of community settings, including senior citizen centers, churches, schools, workplace, etc.
Prerequisite: Admission to the School of Nursing, NRS 200 and BIO 307.
Prerequisite or corequisite: NRS 201, 203 or 204, 220, 228, 252.

NRS 225 Effective Communication in Clinical Practice (2)
Focus on effective communication as the basis for implementing the nursing process. Initiates development of skills in deliberative communication, and presents behavioral theory related to successful application of communication skills in both non-clinical and clinical interpersonal encounters.

NRS 228 Pharmacology in Professional Nursing (3)
Focuses on pharmacologic interventions in health and illness. Basic principles of pharmacology needed to safely care for clients; includes implications for specific drugs.
Prerequisite: Admission to the School of Nursing, NRS 200 and BIO 307.
Prerequisite or corequisite: NRS 224 or 226.

NRS 230 Pharmacology in Professional Nursing (2)
Focuses on basic concepts of pharmacology and their application in the clinical setting.
Prerequisite: Admission to RN/BSN degree completion sequence.

NRS 240 Health Education (2)
Presents theoretical concepts of teaching, learning, and motivation. Incorporates application of individual and group instructional strategies.
Prerequisite: Admission to the School of Nursing or permission of instructor.

NRS 252 Scientific Inquiry I (2)
Introduction to the scientific basis of professional nursing practice. Focuses on the theory and application of information related to critical thinking, nursing process, clinical judgment, and research, including use of information technology.
Prerequisite: Admission to the School of Nursing, NRS 200 and BIO 307.
Corequisite: NRS 201, 203, 224 or 226.

NRS 301 Health Assessment II: Theory (1), Laboratory (1)
Emphasis on adaptation in health assessment necessitated by pathologic and episodic changes.
Prerequisite: Completion of School of Nursing program plan for sophomore year.
Corerequisite: NRS 320, 326 or 328, 354.

NRS 320 Pathophysiology (3)
Concepts and principles common to health deviations, across the life span, in all major physiological functions.
Prerequisite: Completion of School of Nursing program plan for sophomore year.
Corequisite: NRS 301, 326 or 328, 352.

NRS 322 Pathophysiology (3)
Examines how physiological functions are modified by disease processes.
Prerequisite: Completion of School of Nursing program plan for sophomore year.

NRS 323 Nursing Care of Children: Theory (2), Clinical (2)
Implications of 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.
Prerequisite: Completion of School of Nursing program plan for sophomore year.
Corequisite: NRS 325.

NRS 324 Nursing Care of Adults I: Theory (2), Clinical (2)
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.
Prerequisite: Completion of School of Nursing program plan for sophomore year.
Corequisite: NRS 325.

NRS 325 Learning Resource Lab (1-2)
Practice and validation of selected nursing care skills in the learning resource laboratory.
Prerequisite: Completion of School of Nursing program plan for sophomore year.

NRS 326-328 Caring for the Acutely Ill I and II: Theory (3), Clinical (3), (6 each)
Application of the nursing process with clients of all ages and their families who are experiencing acute alterations in biological, psychological, developmental (includes child bearing processes), and environmental functioning. Field experiences provide opportuniy to care for clients in acute care settings and follow-up as the clients progress to care in less intensive settings.
Prerequisite: Completion of School of Nursing program plan for sophomore year.
Prerequisite or Corequisite: NRS 301, 320, 348, 352, 354.

NRS 333 Nursing Care of Clients with Emotional Disorders: Theory (2), Clinical (2)
Study focuses on the care of clients in psychiatric settings. Includes exploration of variables affecting the development of psychopathology and emphasizes the development of nursing interventions to provide care for patients experiencing psychiatric problems.
Prerequisite: Completion of School of Nursing program plan for sophomore year.
Corequisite: NRS 325.

NRS 334 Nursing Care of the Emerging Family: Theory (2), Clinical (2)
Experience in the care of families throughout the child-bearing 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.
Prerequisite: Completion of School of Nursing program plan for sophomore year.
Corequisite: NRS 325.

NRS 348 Behavioral Response to Illness (2)
Examines crisis intervention, death and dying, ethics, normal adaptation to illness and alternative therapies.
Prerequisite: Completion of School of Nursing program plan for sophomore year or instructor permission.

NRS 352 Home Care (2)
Focuses on the knowledge, skills and attitudes necessary to implement home care principles in home setting. Home care experience will be included in NRS 326 and 328.
Prerequisite: Completion of School of Nursing program plan for sophomore year.
Prerequisite or corequisite: NRS 301, 320, 326 or 328.

NRS 354 Nursing Care Management (2)
Focuses on knowledge and skills to provide care management in a variety of settings across the health-illness continuum, development of care manager role, and exploration of the ethical, legal, and financial issues impacting health care delivery. (Management experience will be included in NRS 326 and 328.)
Prerequisite: Completion of School of Nursing program plan for sophomore year, NRS 301 and 320.
Corequisite: NRS 326 or 328, 348, 352.

NRS 420 Professional Nursing in the Community: Theory (3), Clinical (5)
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. *Satisfies the university ethnic diversity requirement.*
Prerequisite: Completion of School of Nursing program plan for junior year.

NRS 422 Nursing Research (3)
A broad overview of the research process in nursing. Includes content related to nursing theory, research design and data analysis strategies. Major emphasis is on the use of research concepts for the purpose of evaluating relevant research for use in nursing practice.
Prerequisite: Completion of School of Nursing program plan for junior year.

NRS 424 Caring for the Chronically Ill: Theory (2), Clinical (4)
Focuses on the application of nursing process with clients experiencing irreversible alterations of biological, psychological, developmental, and/or environmental processes. Includes client-centered interventions for individuals, families and groups impacted by these conditions. Field placements will include rehabilitative and community settings.
Prerequisite: Completion of School of Nursing program plan for junior year.
Corerquisite: NRS 446.

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.
Prerequisite: Completion of School of Nursing program plan for junior year.
Corequisite: NRS 436.

NRS 434 Nursing Care of Adults II (3)
Nursing of adult clients experiencing increasingly complex biopsychosocial health altercations.
Prerequisite: Completion of School of Nursing program plan for junior year.
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.
Prerequisite: Completion of School of Nursing program plan for junior year.

NRS 446 Vulnerable Groups (2)
Focuses on epidemiology, environmental health, community assessment, addressing community problems with nurses serving as advocate, care giver, leader and teacher. (Clinical experiences will be included in NRS 424.)
Prerequisite: Completion of School of Nursing program plan for junior year.
Corequisite: NRS 424.

NRS 452 Scientific Inquiry II (2)
Emphasizes the salient points of the research process, critical appraisal of utilization of findings. Solidifies the relationship of nursing research with clinical practice.
Prerequisite: Completion of School of Nursing program plan for junior year, NRS 424 and 446.
Corequisite: NRS 472.

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. May be repeated for additional credit.
Prerequisite: Completion of School of Nursing program plan for junior year.

NRS 472 Professional Nursing Synthesis: Theory (1), Clinical (5)
Capstone course. Students select clinical area of their choice and do an "internship" with a faculty-approved preceptor. Accompanied by a seminar that would parallel NRS 252.
Prerequisite: Completion of School of Nursing program plan for junior year, NRS 424 and 446.
Corequisite: NRS 452.

NRS 490 Independent Study (1-12)
Options include the opportunity for selected students to participate in faculty research or preceptorships in areas of special interest. Permission of the associate dean is needed to enroll for more than 4 credits of independent study in one semester. May be taken more than once for a total of 12 credits.

UNIVERSITY FACULTY

This list reflects faculty appointments effective March 15, 1998, as they were available on the publication date.

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The Senate carries out much of its work through its committees, all staffed mainly by faculty members but generally including student and administrative representatives as well. Currently, there are 18 such committees whose responsibilities reflect the range of the Senate's concerns.

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Course Reference

Accounting (ACC) 261
American Studies (AMS) 231
Anthropology (AN) 216
Applicable Analysis and Mathematical Modeling (APM) 134
Applied Language Studies (ALS) 124
Art History (AH) 73
Biochemistry (BCM) 226
Biology (BIO) 83
Chemistry (CHM) 93
Chinese Language (CHE) 141
Cinema Studies (CIN) 235
Communication (COM) 206
Computer Science and Engineering (CSE) 330
Cytotechnology (CT) 364
Dance (DAN) 171
Economics (ECN) 99, 263
Electrical Engineering (EE) 335
Elementary Education (EED) 279
Engineering (EGR) 330
English (ENG) 103
Environmental Studies (ENV) 228
Exercise Science (EXS) 350
Finance (FIN) 266
Foundations of Education (FE) 284
French Language and Literature (FRH) 141
Geography (GEO) 243
German Language and Literature (GRM) ... 143
Health Behavioral Sciences (HBS) 353
Health Sciences (HS) 355
Hindi-Urdu Language (HIU, HIN, URD) ... 145
History (HST) 110
Histotechnology (HT) 364
Honors College (HC) 373
Human Interaction (HI) 292
Human Resource Development (HRD) 292
Industrial Health and Safety (IHS) 357
International Studies (IS) 120
Instructional Systems Technology (IST) 297
Italian Language and Literature (IT) 145
Japanese Language and Literature (JPN) 145
Journalism (JRN) 210
Labor Education (LE) 295
Linguistics (LIN) 126
Literatures in Translation (LIT) 149
Management (MGT) 267
Management Information Systems (MIS) ... 268
Marketing (MKT) 269
Mathematical Methods of Operations Research (MOR) 136
Mathematics (MTH) 131
Mathematics for Elementary Education Majors (MTE) 136
Mechanical Engineering (ME) 337
Medical Laboratory Science (MLS) 364
Medical Technology (MT) 366
Michigan Studies (MC) 236
Modern Language (ML) 150
Music (Applied) (MUA) 161
Music, Theatre, Dance (MTD) 168
Music Ensembles (MUE) 162
Music History, Literature, Appreciation and Education (MUS) 164
Music Theory and Composition (MUT) 167
Nuclear Medicine Technology (NMT) 366
Nursing (NRS) 383
Operations Research (MOR) 136
Organizational Behavior (ORG) 270
Philosophy (PHL) 176
Physical Therapy (PT) 371
Physics (PHY) 183
Political Science (PS) 191
Production and Operations Management (POM) 271
Psychology (PSY) 197
Quantitative Methods (QMM) 272
Radiation Therapy 366
Reading (RDG) 296
Religious Studies (REL) 238
Rhetoric (RHT) 203
Russian Language and Literature (RUS) 146
Science Studies (SCS) 280
Secondary Education (SED) 283
Sociology (SOC) 219
Spanish Language and Literature (SPN) 147
Special Education (SE) 285
Statistics (STA) 135
Studio Art (SA) 77
Systems Engineering (SYS) 341
Theatre (THA) 169
Women's Studies (WS) 240

INDEX

Academic
advising, 37
(see also individual academic units and programs)
calendar, 6
conduct policy, 53
forgiveness, 56
honors, 52
options, 231
policies, other, 52
probation and dismissal, 54-56
progress, 20
records, 52
Skills Center, 29
Accounting
courses (ACC), 261
major, 250
minor, 256
for computer science majors, 306
Accreditation
accounting, 246
business administration, 246
chemistry, 90
computer science, 298
education, 275
engineering, 298
nursing, 382
physical therapy, 368
university, 7
Additional undergraduate degrees and majors, 47
Admission
arts and sciences, 65
business administration, 246, 249
elementary education, 276
engineering and computer sciences, 300
freshmen, 11
from Michigan community colleges, 48
guest status, 12
high school students, 11, 258
non-matriculating, 13
non-U.S. citizens, 12
nursing, 376
physical therapy, 369
post-baccalaureate status, 12
second degree, 13
to major standing *(see individual academic departments)*
transfers, 48
Advanced
placement, 13
standing, Honors College, 371
Advertising minor, 210
Advising
academic, 37, 69 *(see also individual academic units and programs)*
academic advising index, 4
College of Arts and Sciences, 69
fee, orientation and advising, 17, 32
General Studies, 345
physics, 181
School of Business Administration, 247
School of Education and Human Services, 276
School of Engineering and Computer Science, 301, 304
School of Health Sciences, 345
School of Nursing, 378
undergraduate, 373
African and African-American studies program, 118
American
Chemical Society, 90
studies concentration, 231
studies courses (AMS), 232
Anatomy specialization, 81
Anthropology courses (AN), 216
Applicable analysis and mathematical modeling courses (APM), 134
Application
for degree, 17
fee, 16
process, STEP, 281
Applied
language studies courses (ALS), 124
mathematics, 306
music courses, 164
statistics concentration, 232, 307
statistics major, Bachelor of Science, 130
Archaeology concentration, 232
Art and Art History
courses (AH), 73
Department of, 72
Arts and Sciences
College of, 65
cooperative education, 71
degree requirements, 65
departmental honors, 70
distribution requirements, 66

field experience program, 71
independent majors, 71
interschool MBA program, 71
majors, 67
multiple majors, 70
STEP, 67
transfer students, 70
Assessment, 38, 258
Associate degree, two-plus-two, 344
Athletics, 63
Attendance, class, 58
Auditing courses, 39
Bachelor of General Studies, 344
requirements, 345
Biochemistry
courses (BCM), 226
program, 68, 82, 92, 225
Biological Sciences
courses (BIO), 82
Department of, 79
Secondary Teacher Education Program (STEP), 81
Board of Visitors
School of Business Administration, 244
School of Engineering and Computer Science, 298
School of Health Sciences, 347
School of Nursing, 375
Business Administration
awards, honors, scholarships, 259
cooperative education, 259
course descriptions:
accounting (ACC), 261
applied tech in business (ATB), 263
economics (ECN), 97, 263
finance (FIN), 266
management (MGT), 267
management information systems (MIS), 268
marketing (MKT), 269
organizational behavior (ORG), 270
production and operations management (POM), 271
quantitative methods for management (QMM), 272
degree requirements, 246
requirements for majors, 248-255
School of, 244
Calendar, academic, 6
Campus map, 424
Cancellation, extension class, 62
Career Services, Placement and, 32
Catalog, six year rule, 40
Center
for International Programs, 69, 117
for Robotics and Advanced Automation, 300
for Student Activities and Leadership Development, 34
Certificate programs, 63
Certification
elementary education, 279
secondary education, 67, 281
Certified Public Accountant
preparation, 250
Chemistry
courses (CHM), 93
Department of, 89
engineering chemistry, 90, 327
Secondary Teacher Education Program (STEP), 91
Child care, 30, 274
Chinese
language courses (CHE), 141
studies *(see East Asian studies)*, 118
Cinema courses (CIN), 235
CLEP (credit by examination), 13
Class standing, 38
Code of ethics, American Physical Therapy Association, 371
College of Arts and Sciences
(see Arts and Sciences, College of)
Commendations *(see honors)*
Communication
courses (COM), 206
program, 205
Competency, course, 39
Complaints, procedure, 57-59
Computer
engineering, major, 311
science and engineering
courses (CSE), 330
Department of, 311
science major, 313
science minor, 233, 315
Computing
minor, 283, 306, 315
resources, 14
Concentrations, 69
American studies, 231
applied statistics, 232, 307
archaeology, 232
criminal justice, 233
defined, 42

environmental studies, 234, 307
film aesthetics and history, 234
for engineering and computer science students, 306
for general studies majors, 346
French studies, 140, 235
health behavioral sciences, 352
human and industrial relations, 236
linguistics, 101, 124, 175, 197, 205, 215
Michigan studies, 236
preprofessional studies in medicine, dentistry and optometry, 82, 92, 237
religious studies, 238
urban studies, 239
women's studies, 240
Conferences, 63
Congress, student government, 34
Continuing Education, 62, 382
Continuum Center, 273
Cooperative education, 31
arts and sciences, 71
business administration, 259
engineering and computer science, 305
Counseling Center, 30
Course
adjusting (drop/add), 39
auditing, 39
competency, 38
competency by examination fee, 16
credit system, 38
fees, 15
regulations, 38
repeating, 40
Criminal justice
Concentration, 233
Specialization, two-plus-two program, 215
Curriculum, Instruction and Leadership, Department of, 275
Cytotechnology
courses (CT), 364
specialization, 361
Dance courses (DAN), 171
Dean of Students, 30, 32
Dean's List, 52
Deferred payment plan, 16
Degree requirements, 41
(see also individual academic units and programs)
Degrees, additional, 13, 47
Diploma programs, 63
Discrimination, Illegal, 59
Disability support services, 30
Dismissal, 54
appeal process, 56
option status, 56
Distribution fields, arts and sciences, 66
Double degrees, 47
Double majors, 47, 305
East Asian studies program, 118
Economics
courses (ECN), 99, 263
Department of, 97
major, Bachelor of Arts, 97
major, Bachelor of Science, 254
minor, 98, 256, 307
Education and Human Services
Advising Center, 273, 276
certification, elementary education, 275, 279
course descriptions:
elementary education (EED), 279
foundations of education (FE), 284
human interaction (HI), 292
human resource development (HRD), 293
instructional systems technology (IST), 297
labor education (LE), 295
reading (RDG), 296
science studies (SCS), 280
secondary education (SED), 283
OU Step, 281
special education (SE), 285
Educational Resources Laboratory, 274
Field Placements, 274, 279
School of, 273
Electrical and Systems Engineering
courses (EE), 335
courses (SYS), 341
Department of, 317
Elementary education
candidacy, 276
certification, 279
courses (EED), 279
pre-elementary education, second undergraduate degree, 275
science courses (SCS), 280
program requirements, 275
teaching majors/minors, 277
Engineering
chemistry major, 90, 327
physics major, 182, 328
Engineering and Computer Science
academic standing, 304, 310

admission, 300
concentrations and minors, 306
cooperative education program, 305
course descriptions:
computer science and engineering (CSE), 330
electrical engineering (EE), 335
engineering (EGR), 330
mechanical engineering (ME), 337
systems engineering (SYS), 341
double major, 305
electives policy, 306
major standing, 304
School of, 298
transfer policy, 300
Engineering Sciences Programs, 327
English
courses (ENG), 103
Department of, 100
Enrollment deposit, 17
Entering scholar program, 29
Environment and resource management specialization, 228
Environmental
health
courses (ENV), 228
program, 68, 227
studies concentration, 307
Equity, Office of, 34
Ethnic diversity requirement, 42, 46
Evening degree programs, 62
Exception, petition of, 48
Exercise science
courses (EXS), 350
program, 349
Experiential Education, 31
Extension program, 62
course cancellation, 62
Faculty, university, 387
Family Educational Rights/Privacy Act, 52
Fees, 15-17
refund of, 17-18
Field experience program, 71
Field placements, 274, 380
Film aesthetics/history
concentration, 234
courses (CIN), 235
Finance
courses (FIN), 266
major, 251
minor, 256, 308
Financial Aid and Scholarships
academic requirements, 20
application procedures, 20
financial aid, grants, 19
scholarships, 21-28
short-term loans, 21
Forgiveness, academic, 56
Foundations of education courses (FE), 284
French
courses (FRH), 141
language and literature, 141
studies, concentration, 235
Freshman admission, 11
General
business minor, 308
education requirements, 41-45
education requirements, Honors College, 373
information, elementary education, 277, 275
information, engineering and computer science, 298
management major, 251
service fee, 15
studies degree, 344
undergraduate degree requirements, 40
Geography courses (GEO), 243
German
courses (GRM), 143
modified major, 138
studies concentration, 138
Grade point requirement, 42
Grading system, 50
Graduate Study, Office of, 35
Graduation service fee, 17
Graham Health Center, 31
Grants, 20
Guest status admission, 12
Handicapped student services, *see Disability Support Services*
Health behavioral sciences
courses (HBS), 353
program, 352
Health Sciences
advising, 349
core curriculum, 349
course descriptions
cytotechnology (CT), 364
exercise science (EXC), 350
health behavioral sciences (HBS), 353
health sciences (HS), 355
hystotechnology (HT), 362
industrial health and safety (IHS), 357
medical laboratory sciences (MLS), 364

medical technology (MT), 366
nuclear medicine technology (NMT), 366
physical therapy (PT), 371
radiation therapy (RT), 366
program, 353
School of, 347
Health services, 31
Hindi-Urdu courses (HIU), 145
History
courses (HST), 110
Department of, 108
Secondary Teacher Education Program (STEP), 109
Histotechnology
courses (HT), 364
specialization, 362
Honors
academic, 52
arts and sciences, 70
anthropology, 216
art history, 73
biochemistry, 226
biology, 81
business administration, 259
chemistry, 92
communication, 203
conciliar, 346
departmental, 53
dean's list, 52
economics (arts and sciences), 98
English, 101
general studies, 346
history, 109
Honors College, 374
human resource development, 292
international studies, 117
journalism, 203
linguistics, 124
mathematics and statistics, 130
modern languages, 139
music, theatre, dance, 152
nursing, 382
philosophy, 175
physics, 183
political science, 190
psychology, 197
sociology, 216
university, 53
Honors College, 373
courses (HC), 374
Housing, 33
Human Development and Child Studies
courses (FE, SE), 284
Department of, 284
Human interaction (HI) courses, 292
Human and industrial relations
concentration, 236
Human Resource Development
courses (HRD), 292
Department of, 286
Human Resouces Management
major, 252
minor, 257
Human services specialization, 287
Independent
major, arts and sciences, 71
project, Honors College, 374
Industrial health and safety
courses (IHS), 357
grade point policy, 357
program, 356, 357
Institute for Action Research and Professional Development, 274
Instructional Systems Technology course (IST), 297
Instructors, standards, 54
Intercollegiate sports, 63
International
management minor, 357
orientation for engineering/computer science students minor, 308
Programs, Center for International, 116
students and scholars, 32
Studies courses (IS), 120
Internship program, 32 *(see also individual academic units)*
Interschool MBA, 71
Italian language and literature courses (IT), 145
Japanese language and civilization
minor, 140
Japanese language and literature
courses (JPN), 145
studies *(see East Asian studies)*, 118
Journalism
courses (JRN), 210
program, 209
Ken Morris Center for the Study of Labor and Work, 274
Labor
and employment studies minor, 291
education courses (LE), 295

studies center, 274
Late
add fee, 16
payment penalty, 16
registration fee, 16
Latin American
language and civilization, 139
studies program, 119
Legal assistant program, 63, 190
Library, 60
Licensure, nursing, 382
Linguistics
concentration, 101, 124, 175, 197, 205, 215
courses (LIN), 126
Department of, 123
Literatures in translation courses (LIT), 149
Loans, short-term, 21
Lowry Center for Early Childhood Education, 30, 271
Macomb University Center, 62
MACRAO agreement principles, 49
Major requirements, arts and sciences, 65
Majors *(see also modified majors)*
accounting, 250
additional, 47
African and African-American studies, 118
anthropology, 214
applied statistics, 130
art history, 72
arts and sciences, 67
biochemistry, 68, 90, 225
biology, 80
chemistry, 90
Chinese studies *(see East Asian studies)*, 118
communication, 205
computer engineering, 311
computer science, 313
East Asian studies, 118
economics (Bachelor of Arts), 97
economics (Bachelor of Science), 254
electrical engineering, 317
elementary education, 275
elementary teaching, 141, 275
engineering chemistry, 327, 90
engineering physics, 182, 328
English, 100
environmental health, 68, 227
finance, 251
French language and literature, 138
general management, 250
German language and literature, 138
health sciences, 347, 353
history, 108
human resource development, 286
human resources management, 252
independent, 71
industrial health and safety, 356
international studies, 117
Japanese studies *(see East Asian studies)*, 118
journalism, 209
Latin American language and civilization, 139
Latin American studies, 119
linguistics, 123
management information systems, 251
marketing, 253
mathematics, 129
mechanical engineering, 322
medical laboratory sciences, 360
medical physics, 181
multiple, 70
modern languages, 138
music (Bachelor of Arts), 152
music (Bachelor of Music), 155
music education, 155, 156
nursing, 376
performing arts, 152
philosophy, 174
physical therapy *(see Health Sciences)*, 369
physics, 181
political science, 188
psychology, 196
public administration/public policy, 189
Registered Nurse sequence, 381
Russian language and civilization, 139
Sacred Music, 158
Slavic studies, 119
sociology, 214
sociology and anthropology, 214
South Asian studies, 118
Spanish language and literature, 139
systems engineering, 319
teaching, 276-277
two modern languages, 138
Major standing
biochemistry, 225
biology, 79
business administration, 249
chemistry, 90

computer science, 301
economics (Bachelor of Arts), 98
economics (Bachelor of Science), 255
elementary education, 276
engineering, 304
journalism, 209
modern languages, 138
music, 159
physical therapy, 369
Management
courses (MGT), 268
Management information systems
courses (MIS), 268
major, 251
minor, 257
Marketing
courses (MKT), 269
major, 253
minor, 257
Master's programs
business administration, 246
education, 273
engineering and computer science, 299
graduate degrees, 35
interschool MBA, 71
Mathematical methods of operations research courses (MOR), 136
Mathematics and Statistics
courses (MTH, APM, STA, MOR), 131-136
for elementary education (MTE), 136
Department of, 128
Secondary Teacher Education Program (STEP), 130
McCree, Wade Incentive Scholarship Program, 35
Meadow Brook
Art Gallery, 7
Hall, 7
Health Enhancement Institute, 348
Music Festival, 7
Theatre, 7
Mechanical Engineering
courses (ME), 337
Department of, 322
major, 322
Medical
laboratory sciences courses (MLS), 364
laboratory sciences program, 359
grade point policy, 361
physics, 181
technology courses (MT), 366
technology specialization, 362
Michigan
studies concentration, 236
courses (MC), 236
teaching certification, 279
Microbiology specialization, 81
Minors
accounting, 254, 306
advertising, 210
African and African-American studies *(see international studies)*, 118
anthropology, 215
applied statistics, 307
applied mathematics, 306
art history, 73
biology, 82, 307
chemistry, 92, 307
Chinese studies *(see East Asian and international studies)*, 118
communication, 206
computer science
(for mathematics majors), 131
(for nonengineering majors), 233, 315
computing, 233, 315
dance, 160
defined, 42
East Asian studies, 118
economics, 98, 256, 307
elementary teaching, 140, 277
English, 101
environmental health, 228
environmental studies, 307
exercise science, 349
finance, 255, 308
for engineering and computer science majors, 306
for general studies majors, 346
for liberal arts programs, 68
for nonbusiness majors, 255
French, 140
French language and literature, 140
general business, 257, 308
German, 140
German language and literature, 140
German studies, 140
history, 109
human resource development, 290
human resources management, 257
industrial health and safety, 357
international management, 257
international orientation for engineering/computer science students, 308

international studies, 118
Japanese language and civilization, 140
journalism, 210
labor and employment studies, 291
Latin American studies, 119
linguistics, 124, 308
management information systems, 257, 308
marketing, 257
mathematics, 131
modern language, 140
modern languages and literatures, 140
music, 160
philosophy, 175
physics, 183, 309
political science, 189
production and operations management, 257, 309
psychology, 197
public relations, 210
quantitative methods, 258, 309
Russian, 140
Russian language and literature, 140
science, 243
secondary teaching, 69, 81, 91, 101, 109, 130, 138, 160, 181, 189, 206, 215
Slavic studies, 119
sociology, 215
South Asian studies, 118
Spanish, 140
Spanish language and literature, 140
speech, 206
studio art, 73
teaching 141, 277
theatre, 160
two/three-science, 243
Modern Languages and Literatures
courses, 141-150
Department of, 137
Secondary Teacher Education Program (STEP), 138
Modified majors
anthropology, 215
biology, 81, 82
communication, 205
English, 101
French, 139
German, 138
linguistics, 124
modern languages, 138, 139
philosophy, 175
psychology, 195
Russian, 139
sociology, 215
Spanish, 139
Music, Theatre and Dance
course descriptions:
dance (DAN), 171-173
interdisciplinary performing arts (MTD), 168-169
music (MUA, MUE, MUS, MUT), 161-168
theatre (THA), 169-171
Department of, 151
Majors:
music:
Bachelor of Arts program, 152
Bachelor of Music program, 156
performing arts, 152
Minors, 160
Secondary Teacher Education Program (STEP), 160, 281
Need-based grants, 19
Nonmatriculating admission, 13
Non-U.S. citizens, admission, 12
Northwestern Michigan College University Center, 346
Nuclear medicine technology
courses (NMT), 366
specialization, 363
Nursing
admission, 376-378
accreditation, 382
advising, 378
annual requirements, 380
courses (NRS), 383
field placements, 380
Graduate program, 376
licensure, 382
policies and procedures, 380
requirements, 378
School of, 375
Student Nurses Assoc., 382
transfer policy, 378
Oakland Center, 31
Occupational health and safety specialization, 227
Office of Equity, 34
Office of field placements, 274
Office of Graduate Study, 35
Operations research courses (MOR), 136
Organizational behavior courses (ORG), 270
Orientation, 32
fee, 17

Other academic options, 231
Out-of-state tuition regulations, 18
OU STEP, 281
Performance
  piano or organ, 157
  vocal, 157
Performing arts
  courses (MTD), 168-169
  major, 152
Petition of exception, 48
  (*see also individual academic units*)
Philosophy
  courses (PHL), 176
  Department of, 174
Physical
  education (*see exercise science*), 349
Physical Therapy
  courses (PT), 371
  grade point policy, 370
  programs, 368
Physics
  advising, 181
  courses (PHY), 183
  Department of, 180
  engineering physics, 182, 328
  Secondary Teacher Education
    Program (STEP), 181
Placement
  advanced, 13
  and career services, 32
  exams
    mathematical sciences, 128
    modern languages, 137
  testing, 32
Plan of study
  engineering and computer science, 301
  nursing, 379
Planning pages, 422-423
Political science
  courses (PS), 191
  Department of, 188
Postbaccalaureate status, admission, 12
Pre-college programs, 34
Pre-elementary education, 275
Prelaw studies, 242, 190
Premedical studies, 242
Prenursing year, 376
Preprofessional studies in medicine,
  dentistry and optometry, 82, 92, 237
Privacy Act, 52
Probation, academic, 54
Problem resolution, 57
Production and operations management
  courses (POM), 271
  minor, 257, 309
Psychology
  courses (PSY), 197
  Department of, 196
Public administration/public policy, 189
Public relations minor, 210
Quantitative methods courses (QMM), 272
  minor, 258, 309
Radiation therapy
  courses (RT), 366
  specialization, 363
Reading and Language Arts
  courses (RDG), 296
  Department of, 296
Readmission, 17, 57
Records, academic, 52
Recreation, Campus, 29
Refund of fees, 17
Registered Nurse sequence, 381
Regulations governing courses, 38
Religious studies
  concentration, 238
  courses (REL), 238
Repeating courses, 39
Research opportunities, 14, 91
Residence
  hall facilities, 33
  hall fees, 17
  requirement, 18, 42
Responsibility, student, 37
Rhetoric, Communication and Journalism
  courses (COM), 206; (JRN), 210;
    (RHT), 203
  Department of, 202
  programs, 203, 205, 209
Role and Mission, 8
Russian
  courses (RUS), 146
  language and civilization, 139
Scholarships, 21, 259
Science
  liberal arts minor, 243
  studies courses (SCS), 280
Second undergraduate degrees, 47
Secondary
  certification, 67
  education courses (SED), 283
  teaching education program (STEP), 281
  teaching minors, 69
    biology, 82

chemistry, 91
computer science, 316
dance, 160
English, 101
history, 109
mathematics, 131
modern languages, 138, 140
physics, 181
political science, 189
speech, 206
Teacher Education Program (STEP), 67, 281
biology, 81
chemistry, 91
history, 109
mathematics, 130
modern languages, 138
music, 160
physics, 181
Short-term loans, 21
Sigma Theta Tau, 382
Skill development
courses (MTH 011-012), 131
programs, 34
Slavic studies program, 119
Social studies, teaching minor, major, 278
Sociology and Anthropology
courses (AN), 216; (SOC), 219
Department of, 214
South Asian studies program, 119, 175
Spanish
courses (SPN), 147
language and literature, 147
Special
education course (SE), 285
opportunities for students, 14
Programs, Department of, 34
Specializations
anatomy, 81
cytotechnology, 361
dance, 153
defined, 42
environmental and resource management, 228
histotechnology, 362
human services, 288
medical technology, 362
microbiology, 81
music theatre, 154
nuclear medicine technology, 363
occupational health and safety, 227
radiation therapy, 363
theatre performance, 153
theatre production, 154
toxic substance control, 228
training and development, 289
Statistics and Mathematics
Dept of, 128
Statistics courses (STA), 135
Student
Activities and Leadership Development, 34
Affairs, Division of, 29
employment, 19
International, 31
Nurses Association of Oakland University, 382
organizations, activities, 34
responsibility, 37
Student Success Services Program, 33
standards, 54
Studio art
courses (SA), 77
minor, 73
Study abroad, 14, 119, 144
Supplemental Instruction (SI), 29
S/U grading option, 51
Systems engineering
courses (SYS), 341
major, 319
Teacher certification, 279
Teaching majors/minors (SEHS), 277-278
Teaching minor, dance, 160
Test preparation workshops, educational, 63
Testing services, 34
Theatre courses (THA), 169
Theatre performance, 153
Theatre production, 154
Theory and composition, music
courses (MUT), 167
Time limits, 59
Toxic substance control specialization, 228
Training and development
specialization, 289
Transcripts *(see Academic records)*, 52
Transfer
admission, 48
arts and sciences provisions, 49-50, 70
business administration, 246
community college, 48-49
credit evaluation, 49
engineering and computer science, 300-301
general education, 49
nursing, 378
practices, 48

principles, 49
student information, 48
writing proficiency, 41
Translation certification, 140
Tuition and fees, 15
Tutorial assistance
(see Academic Skills Center), 29
Two-plus-two program, 215
Two modern languages program, 138
Undergraduate degree requirements, 40
University
faculty, 387
honors, 52
library, 60
offices, 403
Senate, 408
Student Congress, 34
Upward Bound program, 34
Urban studies concentration, 239
Urdu courses (HIU), 145
Veterans, 19
Vocal music education, 156
Withdrawals, undergraduate, 57
Women's studies
concentration, 240
courses (WS), 240
Writing proficiency requirement, 41

PLANNING PAGE

General Education Requirements			
Date	Field Category	Course Taken	Credits
	Arts		
	Literature		
	Language		
	Western Civilization		
	International Studies		
	Social Science		
	Mathematics		
	Natural Science		

Total credits
(Mininum 32)

Writing Proficiency Requirements	
	Rhetoric 150
	Rhetoric 160

Ethnic Diversity Requirements	
	Course Taken

College or School Requirements			
Date	Field Category	Course Taken	Credits

Total credits

Major:	

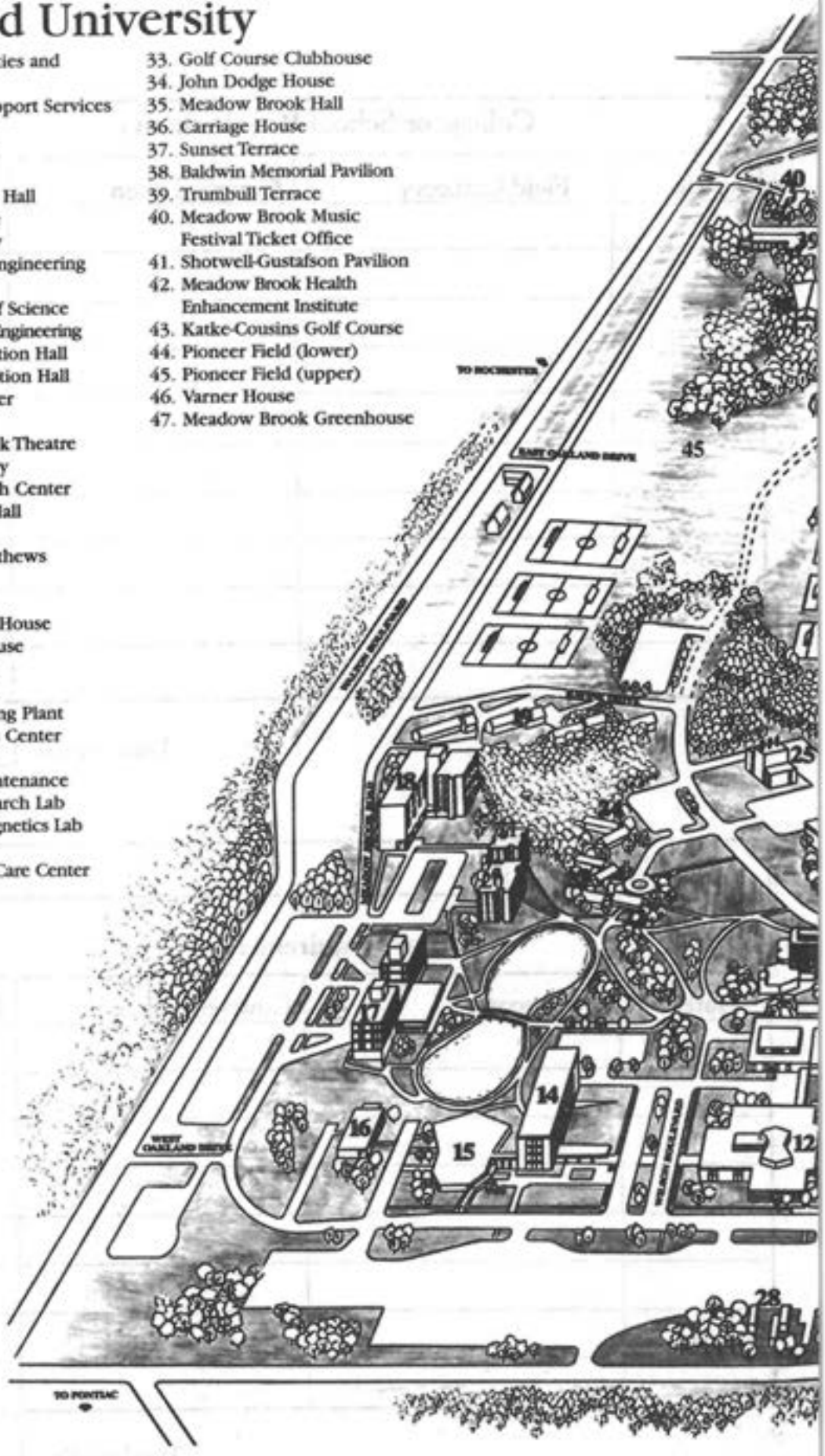
Major Requirements

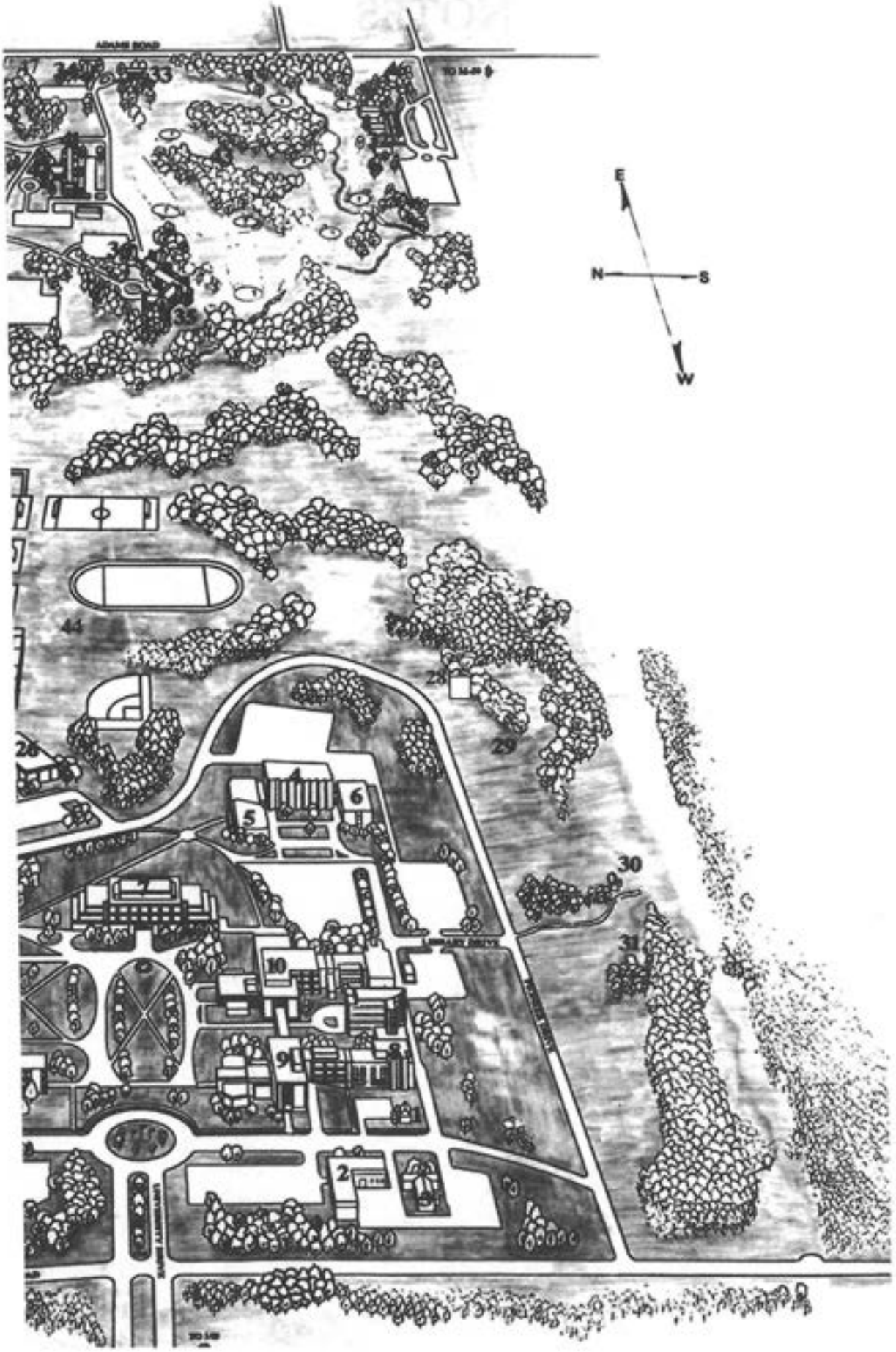
Date	Category	Courses Taken	Credits

Total credits

Oakland University

1. Campus Facilities and Operations
2. Police and Support Services Building
3. Belgium Barn
4. Varner Hall
5. Varner Recital Hall
6. Studio Theatre
7. Kresge Library
8. Science and Engineering Building
9. Hannah Hall of Science
10. Dodge Hall of Engineering
11. South Foundation Hall
12. North Foundation Hall
13. Oakland Center
14. Wilson Hall
15. Meadow Brook Theatre and Art Gallery
16. Graham Health Center
17. Vandenberg Hall
18. Hamlin Hall
19. George T. Matthews Apartments
20. Hill House
21. Van Wagoner House
22. Fitzgerald House
23. Anibal House
24. Pryale House
25. Central Heating Plant
26. Lepley Sports Center
27. O'Dowd Hall
28. Grounds/Maintenance
29. Clinical Research Lab
30. Kettering Magnetics Lab
31. Observatory
32. Lowry Child Care Center
33. Golf Course Clubhouse
34. John Dodge House
35. Meadow Brook Hall
36. Carriage House
37. Sunset Terrace
38. Baldwin Memorial Pavilion
39. Trumbull Terrace
40. Meadow Brook Music Festival Ticket Office
41. Shotwell-Gustafson Pavilion
42. Meadow Brook Health Enhancement Institute
43. Katke-Cousins Golf Course
44. Pioneer Field (lower)
45. Pioneer Field (upper)
46. Varner House
47. Meadow Brook Greenhouse

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Preparing Learners for the 21st-Century
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