Study Information Office located in the Center for International Programs. Information on work-study opportunities sponsored by institutions other than Oakland University can be obtained from the Career Advising and Placement Office and from the Center for International Programs.

HONORS COLLEGE

DIRECTOR: *Robert C. Howes (History)*

COUNCIL: *Sheldon Appleton (Political Science), Charles B. Lindemann (Biological Sciences), Lewis N. Pino (Chemistry), Norman Susskind (Modern Languages and Literatures), one sophomore, one junior, and one senior Honors College student*

The Honors College has been established by the faculty of Arts and Sciences for highly motivated students who wish an unusually challenging undergraduate education. It provides a specially designed general education and additional requirements in conjunction with a departmental major in the College of Arts and Sciences or in 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 into the Honors College.

REQUIREMENTS AND PROCEDURES

The Departmental Major

1. The student must complete a departmental major in the College of Arts and Sciences or a prescribed course of study in the School of Economics and Management, School of Human and Educational Services, School of Engineering and Computer Science, School of Nursing, or the Center for Health Sciences.
2. Honors College students must follow specially designated honors tracks in departments where they exist.
3. The Honors College Council will accept a student who is not pursuing a standard major (for example, a student with an independent major) if it deems that student's program to be of sufficient breadth, depth, and coherence.

The Honors College General Education Requirements

1. The student must successfully complete the four Honors College core courses (HC 201, 202, 203, 204).
2. The student must successfully complete at least one 4-credit course, outside his/her major, in each of three of the following five areas: I. literature and the arts (art, art history, communication arts, English, linguistics, modern languages and literatures, music); II. history, philosophy, area studies; III. social sciences; IV. natural sciences; V. mathematics. Any course that counts toward a major in a department of the College of Arts and Sciences will be acceptable in fulfillment of this requirement. Any other course must be specifically approved by the student's Honors College adviser or by the director of the Honors College. Nursing students must satisfy this requirement only in areas I and III.
3. The student must successfully complete a senior colloquium (HC 401).
4. The student must attain second-year foreign language proficiency.

Advanced Standing

1. The student (normally by the end of his/her fourth semester) shall apply for advanced standing in the Honors College. Following receipt of this 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 several Honors College core courses which the student will have completed.)
2. The council may (a) admit the student to advanced standing, (b) admit the student to advanced standing conditionally, or (c) ask the student to withdraw from the Honors College. If the student is admitted conditionally, he/she will be informed of the reasons.
3. Normally a student will not be considered for admission to advanced standing (or for removal of the condition of acceptance) later than the fourth week of the semester following that in which he/she shall have completed 80 credits.

The Independent Project

1. The student must successfully complete a major creative or scholarly work under the supervision of a faculty member after approval of the project by the Honors College Council. The independent project proposal should be submitted to the Council before the student completes his/her junior year. In any case, it must be approved by the council within the first four weeks of the semester following that in which the student completes 96 credits.
2. The student may receive departmental or Honors College independent study credit for all or part of this work. He/she may, but is not required to, register for HC 490.
3. This is to be an independently designed and completed project.
4. Completed independent project reports are due no later than one week prior to the last day of classes in the semester in which the student intends to graduate.

Graduation Grade Point Average and Graduation Honors

1. A grade point average of at least 3.30 is required for graduation.
2. The Honors College student may receive departmental and university graduation honors.

HONORS COLLEGE COURSE OFFERINGS

HC 201, 202, 203, 204 Honors College Core Courses (4 each)
Introductions to a range of ways of thinking characteristic of a modern university. Instructors for HC 201 will be drawn from art, art history, communication arts, English, linguistics, modern languages and literatures, or music. Instructors for HC 202 will be drawn from the history or philosophy departments or from the area studies program. Instructors for HC 203 will be drawn from the departments of economics, political science, psychology, or sociology/anthropology. Instructors for HC 204 will be drawn from the departments of biological sciences, chemistry, mathematical sciences, or physics. Offered annually. HC 201, 202, 203, and 204 may be repeated for credit as elective courses, provided that the discipline within the area is not repeated.

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 (4)
Supervised instruction in the Honors College independent project. May be repeated for credit. Offered each semester.

NEW CHARTER COLLEGE

COCHAIRPERSONS: *Irving Torgoff (Psychology) and Leo Gerulaitis (History)*

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

ADJUNCT FACULTY: *Charles Morton (Philosophy), Laurel Torgoff (Clinical Psychologist), Bernard Travnikar (Child Counselor)*

Drawing on faculty from departments and schools throughout the university, New Charter College (NCC) offers an interdisciplinary, individual approach to learning. Students pursuing a major in the College of Arts and Sciences, School of Engineering, or Human Resources Development majors in the School of Human and Educational Services may fulfill part of their general education requirement through interdisciplinary course work in New Charter College. B.G.S. candidates will find the New Charter offerings to be broad, flexible, and challenging. Although New Charter College does not offer a major or a degree, degree candidates in any of Oakland University's schools or departments may augment their studies through course work in New Charter. Counseling is also available to students enrolled in New Charter courses.

Courses on all levels ending in numbers from 11-19 designate orientation toward the creative arts, those ending in 21-29 emphasize humanities, those ending in 31-39 are rooted in social sciences, those ending in 41-49 grow out of natural sciences, and those ending in 51-59 are oriented to community studies.

COURSE OFFERINGS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

CENTER FOR THE FINE AND PERFORMING ARTS

The Center for the Fine and Performing Arts of the College of Arts and Sciences offers a Bachelor of Music degree. The center also functions as a service unit for the Bachelor of Arts degree with a major in music and for the Bachelor of Science degree with a major in music education offered by the College of Arts and Sciences.

GENERAL REQUIREMENTS FOR THE BACHELOR OF MUSIC DEGREE

I. General Degree Requirements

A student must:

1. Have successfully completed a minimum of 128 credits for the Bachelor of Music degree.
2. Have met all general undergraduate degree requirements.
3. Have been admitted to degree candidacy by the university and the College of Arts and Sciences, have completed all requirements for the Bachelor of Music, and have been admitted to study in at least one of the music specializations.

II. The Requirement of Proficiency in English Composition

The student must satisfy the university writing proficiency requirement as specified in the academic policies and procedures section of this catalog.

III. The General Education Requirement

For the Bachelor of Music degree, the student must complete a total of 32 credits from the courses listed below and described in the College of Arts and Sciences section, according to the following distribution:

Arts	4-8
Modern Languages	8-16
History, Literature, and Philosophy	8
Mathematics, Science, Social Studies, Area Studies	4-8

Arts

AH 100	Introduction to Western Art I
AH 101	Introduction to Western Art II
CIN 150	Introduction to Film
DAN 173	Dance History and Appreciation
THA 100	Introduction to Theatre
THA 268	Theatre History I
THA 269	Theatre History II

Modern Language

For the Bachelor of Music degree, 8 to 16 credits in a foreign language (or demonstration of proficiency equal to second semester of a language), and/or in courses selected from the following list, some of which are acceptable for certain Bachelor of Music degrees. Please consult the *Music Handbook* (available from the Department of Music).

ML 211	Diction for Singers, First Semester
ML 212	Diction for Singers, Second Semester
SCN 207	Semantics

SCN 303	Communication Theory
PHL 102	Introduction to Logic
PHL 170	Introduction to Formal Logic

History

HST 150	History of Western Civilization
HST 200	European History to 1300
HST 201/202	European History, 1300-1815; since 1815
HST 214/215	Introduction to American History

Literature and Philosophy

ENG 100	Masterpieces of World Literature
ENG 105	Shakespeare
ENG 111	Modern Literature
ENG 224	American Literature
ENG 241	British Literature
LIT 281	Continental European Literature in Translation I
LIT 282	Continental European Literature in Translation II
PHL 101	Introduction to Philosophical Thinking
PHL 103	Introduction to Ethics
PHL 204/205/206	History of Western Philosophy
PHL 250	Philosophies and Religions of Asia
NCC 121	Images of Humanity
ED 332	Literature for Children
HRD 301	The Nature of Man
HRD 302	Ethics and Personal Crises

Area Studies

AS 210	Introduction to China
AS 220	Introduction to Japan
AS 230	Introduction to Africa
AS 240	Introduction to India
AS 250	Introduction to Latin America
AS 260	Introduction to Russia and Eastern Europe
AS 270	Introduction to the Middle East

Mathematics and Science

MTH 104/105	Elementary Functions, Trigonometry
MTH 121	Linear Programming, Elementary Functions
MTH 122	Calculus for the Social Sciences
MTH 154-155	Calculus
MTH 185	Mathematics—Undergraduate Topics
STA 225	Probability and Statistics
BIO 104/105	Biology of the Human
BIO 190/200	Biology
BIO 300	Biology and Society
CHM 104	Introduction to Chemical Principles
CHM 144-145	General Chemistry
PHY 101/102	General Physics
PHY 104/105	Astronomy
PHY 106/107	Earth Sciences
PHY 125	The Physics of Music
PHY 127	Human Aspects of Physical Science
ENV 308	Introduction to Environmental Studies
NCC 141	Twentieth Century Science
CIS 122 or 123	BASIC Programming
CIS 130	Introduction to Computer Science

Social Sciences

SOC 100	Introduction to Sociology
AN 101	Evolution of Man and Culture
AN 102	Man in Culture and Society

AN 307	Cultural Anthropology and the Ethnographic Film
ECN 150	Basic Economics
ECN 200	Principles of Macroeconomics
ECN 328	American Economic Development
PS 100	Introduction to American Politics
PS 115	U.S. Foreign Policy
PS 131	Foreign Political Systems
PS 372, 373	Western Political Thought
PS 377	Communism
PSY 100	Foundations of Contemporary Psychology
PSY 130	Psychology and Society
HI 261	Fundamentals of Human Interaction

DEPARTMENT OF MUSIC

CHAIRPERSON: *David Daniels*

PROFESSOR: *Stanley Hollingsworth*

ASSOCIATE PROFESSORS: *Raynold Allvin, David Daniels, James Dawson, Robert Facko, Lyle Nordstrom, Flavio Varani*

ADJUNCT PROFESSOR: *David DiChiera*

SPECIAL INSTRUCTORS: *John Dovaras, Alice Engram, Marvin Holladay*

VISITING INSTRUCTORS: *Ron DeRoo, Mary Rashid*

LECTURERS: *Joyce Adelson, Beverly Labuta, Nancy LeValley, Richard Thurston, Carolyn Tower*

APPLIED MUSIC INSTRUCTORS: *Joyce Adelson (piano), Janice Albright (voice), Mary Bartlett (harp), Christopher Birg (classical guitar), Charles Boles, (jazz piano), Steven Carryer,(jazz guitar), Douglas Cornelsen (clarinet), James Dawson (saxophone), Ron DeRoo (jazz piano), Pamela Dion (bassoon), Alice Engram (voice), Ray Ferguson (harpsichord), Derek Francis (violin), Robert Gladstone (string bass), Marilyn Hedquist (voice), Elizabeth Ilku (harp), Mary Irvine (voice), Wesley Jacobs (tuba), Kent McDonald (piano/organ), Myron McDonald (percussion), Ervin Monroe (flute), Diann Moskal (voice), Lyle Nordstrom (recorder/lute), Patricia Adams Nordstrom (recorder/viola da gamba), Robert Pangborn (percussion), Edward Pickens (jazz string bass), Sam Sanders (jazz saxophone), Joseph Skrzynski (trombone/tuba), John Snow (oboe), Danny Spencer (jazz percussion), James Underwood (trumpet), Flavio Varani (piano), Charles Weaver (French horn), Herbert Williams (jazz trumpet), Ara Zerounian (viola)*

The Department of Music offers major programs leading to a Bachelor of Arts, Bachelor of Music, Bachelor of Science with a major in music education, and a Master of Music.

Prospective music majors must read the *Music Handbook* (available from the music office), and consult with a departmental adviser before beginning a music degree program. In addition, new students are expected to audition during the first week of classes in order to qualify for their chosen performing medium.

Core Requirements for all Degree Programs in Music

1. MUT 211-212, plus 8 credits from MUT 311, 312, 314, 410, 412, and 414.
2. Successful completion of the departmental ear training examination.
3. MUS 320 and two of the following: MUS 328, 329, 330, 334, 345, and 347.
4. Concert attendance requirement as described in the *Music Handbook*.

Requirements for the Liberal Arts Major in Music, B.A. Program

Forty-eight credits in music, with corequisites in art, theatre, and/or dance. This degree is for students who wish a broad general education without a high degree of specialization in music. For specific course requirements see *Music Handbook*.

Requirements for the Bachelor of Music Degree

The Bachelor of Music degree is for students who wish preprofessional and professional preparation in performance, early music, theory, composition, jazz, or commercial music. The degree is awarded upon completion of the requirements listed below, upon recommendation of the faculty of the Department of Music and the School of Performing Arts.

Prospective music majors must read the *Music Handbook* and consult with a departmental adviser before beginning work toward the degree.

Requirements for the Bachelor of Science in Music Education

For students who wish to teach in the public schools; the degree carries Michigan teaching certification. Specializations are possible in instrumental music education (72 credits of music, plus 24 in education) or choral music education (63 credits of music, plus 24 in education). Each specialization also requires a secondary teaching minor, and the choral specialization requires 8 credits of Singers' Diction (ML 211-212). For specific requirements, see the *Music Handbook*.

Requirements for the Secondary Teaching Minor in Music

The student must complete 28 credits in the Department of Music distributed as follows: 8 credits in music theory (MUT); 8 credits in applied music (MUA); four semesters (at least 4 credits) in music ensembles (MUE); a planned program of 8 credits (to be approved by a music adviser) selected from the following: MUS 149, 250, 295, 320, 350, 395, 401, 402, 441, 494, 495, 496. At least 14 of the 28 credits must be in courses numbered 300 or above.

Requirements for the Liberal Arts Minor in Music

Twenty-four credits of music chosen in consultation with a departmental adviser as follows: 8 credits of music theory (MUT); 6 credits of music history (MUS 320, 328, 329, 330, 334, 345, 347); 6 credits of applied music (MUA); 4 credits of music ensemble (MUE).

Foreign Language Requirement

Most music degrees require a foreign language. For requirements for each degree, see the *Music Handbook*.

Concert Attendance Requirement

Completion of a concert attendance card each fall and winter semester a student is enrolled, up to a maximum of four. See the *Music Handbook* for details.

Ensemble Requirement

At least half of the required ensemble credit must involve the student's major applied proficiency.

Major Standing

Prospective music majors must apply to the Department of Music for major standing after completing 48 total college credits, at Oakland University or elsewhere. Normally, transfer students should apply during the first semester at Oakland University. For details, consult the *Music Handbook*.

Auditions

New music majors must audition in their performing medium for a faculty committee within the first week of classes. See the *Music Handbook* for details.

Applied Music Juries

Music majors must play a jury in their major performing medium at the end of each fall and winter semester of applied study. Failure to do so will result in an "I" grade.

Music Specialization Requirements

Core Requirements for all Specializations: see above.

Specialization Requirements	Credits
1. Performance: Piano or Organ	
Ensembles (8 semesters; must include 4 semesters of accompanying)	8
Applied Major	32
Applied Minor	8
Pedagogy	4
Repertoire	4
Senior recital	
Recommended: Conducting (MUS 395)	
2. Performance: Voice or Guitar	
Ensembles (8 semesters; 1 semester of accompanying is recommended for voice majors)	8
Applied Major	32
Applied Minor (must be keyboard unless proficiency equivalent to MUA 471)	8
Repertoire	4
Senior Recital	
Recommended: Conducting (MUS 395)	
Language requirement for voice majors: ML 211-212 (Singers' Diction) and one year of Italian, French, or German	
3. Performance: Orchestral Instruments	
Ensembles (2 ensembles each semester for 8 semesters)	16
Applied Major	32
Applied Minor (must be keyboard unless proficiency equivalent to MUA 471)	8
Repertoire (via independent study)	2
Senior Recital	
Recommended: Conducting (MUS 395)	
4. Early Music	
Ensembles	12
Applied Major	24
Applied Minor	8
Keyboard (MUA 271 or equivalent proficiency)	4
Performance Practice	2
Bibliography (MUS 490)	2
Language Requirement: 16 credits of German, French, or Italian.	
Recommended: Additional credits in music history and Senior Recital	
5. Theory	
Additional theory courses beyond core requirement, chosen from MUT 311, 312, 314, 410, 412, 414	8
Composition	4

Ensembles (6 semesters)	6
Applied Major	12
Keyboard (MUA 471 or equivalent proficiency)	8
Orchestration (MUT 411)	4
Bibliography (MUS 490)	2
World Music	4
Apprentice College Teaching (MUS 497)	2
Conducting (MUS 395)	4
Recommended: Additional credits in music history.	

6. Composition

Composition	16
Additional theory courses beyond core requirement, chosen from MUT 311, 312, 314, 410, 412, 414	8
Orchestration (MUT 411)	4
Ensembles (6 semesters)	6
Applied Major	8
Keyboard (MUA 471 or equivalent proficiency)	8
Conducting (MUS 395)	4
Senior Recital	

7. Jazz

Ensembles (8 semesters)	8
Applied Major	16
Keyboard (MUA 376, 377, 476, 477)	8
Jazz Improvisation Workshop (MUE 341)	8
World Music	4
Recommended: Senior Recital	
Language requirement: French recommended; may also be completed by Singers' Diction (ML 211-212) or 8 credits in Linguistics and/or Speech Communication.	

8. Commercial

Ensembles (8 semesters)	16
Applied Major	16
Keyboard (MUA 471, or equivalent proficiency)	8
Literature of the American Music Theatre	2
Corequisites: Theatre (Technical Laboratory, Fundamentals of Acting, Dance and Movement, Costuming and Makeup)	16
Language Requirement: Must include ML 211-212	

COURSE OFFERINGS

ENSEMBLES

Ensembles are open to all students by audition. May be repeated for credit.

MUE 301 University Chorus (1 or 2)
Performance of the large choral masterpieces from all music periods.

MUE 302 University Community Chorus (1 or 2)
Festival-type mixed chorus for citizens of the surrounding communities who possess vocal experience. Performances of varied choral literature. Meets in the evening.

MUE 304 Oakland Chorale (1 or 2)
Performance of a wide range of choral chamber repertoire from Renaissance to the present.
Prerequisite: Permission of instructor.

MUE 305 Opera Chorus (1 or 2)
An ensemble which performs with the Michigan Opera Theatre.
Prerequisite: Permission of instructor.

MUE 306 Jazz and Show Ensemble (1, 2, or 3)
A performing ensemble emphasizing commercial, jazz, show, and swing choir repertory.
Prerequisite: Permission of instructor.

MUE 309 Meadow Brook Festival Chorus (1)
Performance of major choral masterpieces from all music periods under world-famous

conductors at Meadow Brook Music Festival. May be repeated for a total of 8 credits.
Prerequisite: Permission of instructor.

MUE 310 Vocal Improvisation Workshop (2)
A laboratory in vocal improvisation designed to increase skills in performing commercial and popular music.
Prerequisite: Permission of instructor.

MUE 320 University Orchestra (1 or 2)
Orchestral performance of repertoire from the eighteenth, nineteenth, and twentieth centuries. Several concerts per year, on and off campus. Accompaniments for solo concertos and university choral groups. Membership by audition. Graded S/N.

MUE 331 Concert Band (1 or 2)
An ensemble of wind instruments performing standard concert band literature.
Prerequisite: Permission of instructor.

MUE 340 Jazz Band (1 or 2)
A study of traditional and contemporary literature for large jazz ensembles within the Afro-American cultural context. Both conceptualization of the material and improvisational techniques will be explored and defined.

MUE 341 Jazz Improvisation Workshop (2)
A performance practice laboratory designed to increase improvisational skills indigenous to jazz performance and to identify systematically and use stylistic characteristics of various jazz subcategories.

MUE 350 Opera Workshop (1, 2, or 3)
Study and experience in various forms of musical theatre.
Prerequisite: Permission of instructor.

MUE 351 Musical Theatre Workshop (1 or 2)
Performance and study of repertory of the musical theatre.
Prerequisite: Permission of instructor.

MUE 360 Collegium Musicum (1 or 2)
Performance of Medieval, Renaissance, and Baroque music in various vocal and instrumental combinations. Period instruments and performance practices are emphasized. Graded S/N.
Prerequisite: Permission of instructor.

MUE 370 Guitar Ensemble (1 or 2)
Performance practice and techniques of classical guitar literature involving two or more players.

MUE 371 Woodwind Ensemble (1 or 2)
Ensembles of three or more saxophones performing appropriate literature.
Prerequisite: Permission of instructor.

MUE 373 Percussion Ensemble (1)
Performance of music for various combinations of percussion instruments.
Prerequisite: Permission of instructor.

MUE 380 Chamber Music (1 or 2)
Performing ensemble of various instrumentations. A spectrum of appropriate music literature, medieval through contemporary.

MUE 390 Accompaniment Practicum (1 or 2)
Experience in piano accompaniment of solo and/or ensembles, vocal and instrumental. May be repeated once for credit.
Prerequisite: MUA 370.

APPLIED MUSIC

The following courses each have four course number designations. Music majors are to enroll using the number which corresponds to the year in school—freshmen, 100 level; sophomores, 200 level; juniors, 300 level; seniors, 400 level.

Music faculty may adjust course numbers at the time of the entering audition, or after the first lesson.

Beginners must use the 100-level designation regardless of year in school. Students who have previously studied, either privately or in a college or university, should consult the *Music Handbook* to determine the appropriate course number. May be repeated for credit except where indicated.

The following courses are individual lessons and involve an applied music fee.

MUA 100, 200, 300, 400 **Voice (2 or 4)**
MUA 101, 201, 301, 401 **Piano (2 or 4)**
MUA 102, 202, 302, 402 **Organ (2 or 4)**
MUA 103, 203, 303, 403 **Harpsichord (2 or 4)**
MUA 104, 204, 304, 404 **Violin (2 or 4)**
MUA 105, 205, 305, 405 **Viola (2 or 4)**
MUA 106, 206, 306, 406 **Violoncello (2 or 4)**
MUA 107, 207, 307, 407 **String Bass (2 or 4)**
MUA 108, 208, 308, 408 **Flute (2 or 4)**
MUA 109, 209, 309, 409 **Oboe (2 or 4)**
MUA 110, 210, 310, 410 **Clarinet (2 or 4)**
MUA 111, 211, 311, 411 **Bassoon (2 or 4)**
MUA 112, 212, 312, 412 **French Horn (2 or 4)**
MUA 113, 213, 313, 413 **Trumpet (2 or 4)**
MUA 114, 214, 314, 414 **Trombone (2 or 4)**
MUA 115, 215, 315, 415 **Tuba (2 or 4)**
MUA 116, 216, 316, 416 **Timpani (2 or 4)**
MUA 117, 217, 317, 417 **Percussion (2 or 4)**
MUA 118, 218, 318, 418 **Harp (2 or 4)**
MUA 119, 219, 319, 419 **Guitar (classical) (2 or 4)**
MUA 120, 220, 320, 420 **Renaissance Winds (2 or 4)**
MUA 121, 221, 321, 421 **Viola da Gamba (2 or 4)**
MUA 122, 222, 322, 422 **Lute (2 or 4)**
MUA 123, 223, 323, 423 **Recorder (2 or 4)**
MUA 124, 224, 324, 424 **Saxophone (2 or 4)**
MUA 130, 230, 330, 430 **Piano (jazz) (2 or 4)**
MUA 131, 231, 331, 431 **Guitar (jazz) (2 or 4)**
MUA 132, 232, 332, 432 **Trumpet (jazz) (2 or 4)**
MUA 133, 233, 333, 433 **Saxophone (jazz) (2 or 4)**
MUA 134, 234, 334, 434 **Percussion (jazz) (2 or 4)**
MUA 135, 235, 335, 435 **Double Bass (jazz) (2 or 4)**
MUA 149, 249, 349, 449 **Applied Music (2 or 4)**

May be used to increase the number of private lessons in the student's major or minor performing medium. Must be taken with one of the applied music courses.

The following music courses are group lessons and involve an applied music fee.

MUA 171, 271, 371, 471 **Keyboard Technique (2 each)**
Development of the basic keyboard facility essential to any musician and some acquaintance with keyboard literature. May not be repeated for credit.
Prerequisite: Permission of instructor.

MUA 251 **Beginning Violin Class (1)**
MUA 252 **Beginning Violoncello Class (1)**
MUA 253 **Beginning Flute Class (1)**
MUA 254 **Beginning Clarinet Class (1)**
MUA 255 **Beginning Double Reed Class (1)**
MUA 256 **Beginning Trumpet Class (1)**
MUA 257 **Beginning Trombone Class (1)**
MUA 258 **Beginning Percussion Class (1)**
MUA 259 **Beginning Guitar Class (1)**

MUA 251 through 259 may be repeated for a total of 2 credits.

MUA 260 **Class Voice (2)**
Elementary aspects of singing, including diction, breath control, projection, and repertoire.

MUA 361-362 Vocal Literature I and II (2 each)
A survey of literature for the voice with emphasis on historical style. MUA 361 covers the Middles Ages through the nineteenth century, with emphasis on German song. MUA 362 continues through the nineteenth and twentieth centuries, emphasizing French, British, and American.
Prerequisite: ML 212 (may be taken concurrently) and permission of instructor.

MUA 370 Accompanying (1 or 2)
To help the pianist acquire knowledge of the basic skills required in the ensemble. Representative vocal and instrumental compositions are studied; emphasis is on rehearsal techniques and performance.

MUA 373 Piano Tuning and Technology (2 credits)
Basic skills in tuning and regulating a piano. Ability to set equal temperament as well as some discussion of historic temperaments.
Prerequisite: MUT 212.

MUA 375 Keyboard Ensemble Technique (2)
Class instruction in performance and repertory of multiple keyboard literature.
Prerequisite: Permission of instructor.

MUA 376, 377, 476, 477 Jazz Keyboard Practices (2)
Development of basic jazz keyboard techniques and skill including jazz chord and rhythm reading, melodic development, and voice leading. May not be repeated for credit.
Prerequisite: Keyboard proficiency demonstrated by audition.

MUA 395 Chamber Music Techniques (2)
Group instruction and coaching of performance of chamber music.
Prerequisite: Permission of instructor.

THEORY AND COMPOSITION

MUT 111 Beginning Musicianship (4)
Introduction to the techniques of reading and writing music, notation, pitch, and rhythmic organization, elementary sight singing, dictation, and keyboard familiarity. An elective for nonmusic majors.

MUT 205 Ear Training Preparation (1)
A required course for all full-time music majors who have not satisfied the ear training preparation. See *Music Handbook*. May be repeated for a maximum of 4 credits. Graded S/N.
Prerequisite: MUT 212.

MUT 211 Harmony and Ear Training I (4)
Beginning ear training and rudiments of tonal harmony. The harmonic practice of late eighteenth and early nineteenth centuries; composition and analysis in this style.

MUT 212 Harmony and Ear Training II (4)
Harmonic practice of the late nineteenth and early twentieth centuries; composition and analysis in this style.

MUT 311 Techniques of Musical Analysis (4)
Techniques of analyzing works of various styles and periods, with emphasis on tonal music.
Prerequisite: MUT 212.

MUT 312 Tonal Counterpoint (4)
The contrapuntal style of the eighteenth century; composition and analysis.
Prerequisite: MUT 212.

MUT 314 Jazz Theory (4)
Jazz notation, arranging, and composition.
Prerequisite: MUT 212.

MUT 315 Composition (4)
Private lessons in composition and composition laboratory. Studies, exercises, and projects concerning creativity and craft in music composition. For freshmen and sophomores. May be repeated for credit.
Prerequisite: MUT 312 and permission of instructor.

MUT 410 Twentieth Century Techniques (4)
Compositional practices in the 20th century; composition and analysis.
Prerequisite: MUT 212.

MUT 411 Orchestration (4)
A study of the orchestral instruments and their use in various combinations, including full orchestra and band. MUS 380, 383, 395, and MUT 410 are related courses.
Prerequisite: MUT 212.

MUT 412 Modal Counterpoint (4)
The contrapuntal style of the sixteenth century. Analysis and composition in this style. Offered in alternate years.
Prerequisite: MUT 212.

MUT 414 Jazz Composition and Arranging (4)
Composition and arranging technique for jazz ensembles. Includes study of jazz notational systems, idiomatic jazz practice, standard jazz forms, and orchestration for instruments and voice as used in jazz ensembles.
Prerequisite: Permission of instructor.

MUT 415 Advanced Theory/Composition (4)
Private lessons in composition and composition laboratory: studies, exercises, and projects concerning creativity and craft in composing music. For juniors and seniors. May be repeated for credit.
Prerequisite: MUT 312 and permission of instructor.

MUSIC HISTORY, LITERATURE, AND APPRECIATION

MUS 100 An Introduction to Music (4)
An introduction to the techniques of listening to great music, and a study of its elements, forms, and styles. Begins at the level of the student lacking previous musical experience. An elective for nonmusic majors.

MUS 250 World Music Survey I (4)
Introduction to selected music cultures to acquaint the student with a variety of musical functions and styles at various places and times. Emphasis is on demonstrations via live performances by visiting lecturers and guest artists. May be taken twice for a total of 8 credits.

MUS 300 Music Appreciation: Musical Styles (4)
Investigation of various large musical forms: symphony, sonata, concerto, string quartet, opera, oratorio, and solo song. Each area will be presented by three or four select works.

MUS 320 Survey of Music History and Literature (4)
A survey of music from medieval through modern contemporary, primarily for music majors.
Prerequisite: MUT 212.

MUS 328 Music of the Baroque Period (2)
Music history and literature of the Baroque period.
Prerequisite: MUS 320.

MUS 329 Music of the Classical Period (2)
Music history and literature of the Classical period.
Prerequisite: MUS 320.

MUS 330 Music of the Renaissance (2)
Music history and literature of the Renaissance period.
Prerequisite: MUS 320.

MUS 331 Opera and Music Drama (4)
A study of music drama from the lyric drama of the ancient Greeks to the present. Suggested as an elective for nonmusic majors.
Prerequisite: MUT 211.

MUS 334 Music of the Romantic Period (2)
Music history and literature of the Romantic period.
Prerequisite: MUS 320.

MUS 345 Twentieth Century Music (2)
A study of significant styles and composers from Debussy to the present.
Prerequisite: MUS 320.

MUS 347 History of Jazz (2)
A survey and historical study of the development of jazz, including significant periods and trends, stylistic analysis, and aesthetic foundations.
Prerequisite: MUS 320.

MUS 348 Advanced Jazz History (2)
An intensive study and stylistic analysis of the more recent trends of jazz and commercial music.
Prerequisite: MUS 347.

MUS 350 World Music Survey II (4)
Continuation of MUS 250. A study of selected cultures designed to find relationships between musical styles and functions in the society. Emphasis is on demonstrations through live performances of visiting lecturers and guest artists.

MUS 423 Performance Practices (2)
A study of the performing practices of music of earlier times. Content varies each semester. May be repeated a total of three times for credit with permission of instructor.
Prerequisite: Permission of instructor.

MUS 440 Piano Master Class (2)
Class study of piano literature for stylistic characteristics and technical considerations for proper performance.
Prerequisite: Permission of instructor.

MUS 490 Introduction to Music Bibliography (2 or 4)
An introduction to basic research materials and methods in musicology primarily for the music history and literature major.
Prerequisite: MUS 320 and a 400-level theory course.

MUS 491 Directed Research in Music History (4)
Directed individual reading and research for advanced music history majors.
Prerequisite: MUS 321, 322, and a 400-level theory course.

MUSIC EDUCATION

MUS 149 Music as an Art and as an Elementary School Subject (5)
Introduction to the techniques of listening to music and of teaching music in the elementary school. Begins at a level for the student lacking previous musical experience.

MUS 230 Studies in Choral Music (1, 2, or 3)
Seminar, independent study, and performance of choral music including vocal production techniques, performance practices, and historical foundations. Offered summer session.

MUS 231 Studies in Orchestral Music (1 or 2)
Seminars, independent study, and performance of orchestral music, including study of performance practices, theory, history, and chamber music of various periods. Offered summer session.

MUS 232 Studies in Piano Performance and Literature (2 or 3)
Master class in performance of selected piano works including historical performance practices, and technical considerations. Offered summer session.

MUS 233 Studies in Musical Expression through Movement (2 or 3)
Seminars in music theory and composition and in various forms of movement which express sound. Eurythmics and chironomy are studied as well as standard dance forms. Offered summer session.

MUS 380 Instrumental Methods (Strings) (2)
Provides the teacher with basic facilities and pedagogical techniques for the string family. Offered in alternate years.

MUS 383 Instrumental Wind Methods (2)
Provides the teacher with basic facilities and pedagogical techniques for the woodwind, brass, and percussion families. Offered in alternate years.

MUS 395 Conducting (4)
Basic techniques of conducting, including instrumental and choral. Participants elect to emphasize either instrumental or choral technique and will be assigned at least one hour per week as assistants in university performing groups or public school ensembles.
Prerequisite: MUT 212 and a 300-level theory course.

MUS 401 Teaching Music in Elementary Schools (4)
Organization and content of the general vocal music class in kindergarten through sixth grade. The development of musicality in the child. Emphasis on teaching music reading and ear training to young children.
Prerequisite: MUT 211 and a 300-level theory course.

MUS 402 Teaching Music in Secondary Schools (2)
The content and organization of the complete secondary school curriculum and the role music assumes in it. Selection of appropriate repertoire and development of the school music library.
Prerequisite: MUT 211 and a 300-level theory course.

MUS 403 Conducting Choral Music in Secondary Schools (2)
The organization and conducting of choral music in junior and senior high schools. The development of the adolescent and young adult voice.
Prerequisite: MUT 211 and a 300-level theory course.

MUS 404 Conducting Instrumental Music in Secondary Schools (2)
The organization and conducting of instrumental music in junior and senior high schools. Repertoire, materials, and techniques.
Prerequisite: MUT 211 and a 300-level theory course.

MUS 441-442 Music Pedagogy (4 each)
Principles of music instruction for the studio teacher. The first semester will be devoted to a survey of the field and to observation. The second semester will be devoted to supervised teaching.

MUS 445 Music Criticism (4)
A study of the techniques of evaluating musical performances and making appropriate verbal and written comments. Includes techniques of writing program notes.

MUS 480 Advanced Studies in Choral Conducting and Literature (1, 2, 3, or 4)
Independent and seminar work in advanced choral conducting. Emphasis is on interpretation of choral literature through research. Opportunities are provided for conducting experience in choral lab groups. Offered summer session.
Prerequisite: Choral conducting experience and one music history class.

MUS 481 Advanced Studies in Orchestral Conducting and Literature (1, 2, or 3)
Independent and seminar work in advanced orchestral conducting. Emphasis is on interpretation of orchestral literature through research. Opportunities are provided for conducting experience in a laboratory orchestra. Offered summer session.
Prerequisite: Conducting experience, music theory.

MUS 494 Directed Research in Music Education (2 or 4)
Directed individual reading and research in technology of, innovation in, and psychology of music instruction.
Prerequisite: Two courses from MUS 401, 402, 403, and 404.

MUS 496 Innovations in Music Instruction (2, 3, or 4)
Innovative patterns of music instruction. Materials, methods, and curricula appropriate to changing demands made on the public school music teachers. Offered summer session.
Prerequisite: Permission of instructor.

MUS 499 Special Topics in Music (1, 2, 3, or 4)
Current topics and issues in music performance and literature.
Prerequisite: Permission of instructor.

INDEPENDENT STUDY

MUS 295 Independent Study (1, 2, or 4)
Normally for freshmen and sophomores.
Prerequisite: Permission of department.

MUS 296 Problems in Applied Music (2)
Independent study in technique and literature of the student's major performing area. Graded S/N.
Prerequisite: Permission of department chairperson.

MUS 495 Independent Study (1, 2, or 4)
Normally for juniors and seniors.
Prerequisite: Permission of department.

MUS 497 Apprentice College Teaching (2)
Supervised participation in teaching an undergraduate course in music, together with discussion of teaching methods and objectives.
Prerequisite: Permission of department.

DEPARTMENT OF THEATRE AND DANCE

CHAIRPERSON: *David Stevens*

ADJUNCT PROFESSOR: *Terence E. Kilburn*

ASSOCIATE PROFESSORS: *Adeline Hirschfeld-Medalia, David Stevens*

ADJUNCT ASSOCIATE PROFESSOR: *Jerry Dahlmann*

ASSISTANT PROFESSORS: *Kimberly Sue Ater, James A. Hatfield*

ADJUNCT ASSISTANT PROFESSOR: *Thomas A. Aston*

SPECIAL INSTRUCTOR: *Carol Halsted*

LECTURERS: *Jacqueline M. Ammond, Shannon Jenkins, Philip McPhee, Judith D. Molina, Cornelia Sampson*

The Department of Theatre and Dance offers a minor in the theatre and a minor in dance. Courses are available in all aspects of both disciplines, including acting and directing, technical theatre, ballet, modern dance, jazz dance, and the history, literature, and theory of both theatre and dance. Students are served through basic courses in both disciplines and through courses specifically designed for general education. In addition, public performance programs in both disciplines are available for all students with interest and ability.

Requirements for the Liberal Arts Minor in Theatre

Twenty credits in theatre, distributed as follows:
1. 12 credits: THA 261, 267, and 363
2. 4 credits: THA 268 or 269
3. 4 credits: THA 450 or 462

Requirements for the Liberal Arts Minor in Dance

Twenty credits in dance, distributed as follows:
1. 12 credits: DAN 173, 376, and 372 or 373
2. 8 credits from all other dance courses.

COURSE OFFERINGS IN THEATRE

THA 100 Introduction to Theatre (4)
Theatre as an art form. Topics include acting, directing, design, dramatic literature, theatre history, theory, and criticism. Students will view selected plays.

THA 200 Topics in Theatre Arts (4)
Topics and problems, selected by the instructor, as temporary or experimental additions to the curriculum.

THA 213 Mime (4)
Introduction to the art of gesture and movement. Classical and traditional forms are explored, emphasizing active involvement in mime.

THA 230 Voice and Articulation (4)
Theory and application in voice, articulation, and pronunciation.

THA 261 Technical Laboratory (4)
Survey of techniques of scenery and costume construction and lighting, including proper use of tools and hardware in these three areas. Sixty hours of work on a major production are required.

THA 267 Fundamentals of Acting (4)
An introduction to the basic skills and knowledge required to perform a role in a stage production.

THA 268 Theatre History I (4)
History of the Western theatre from its primitive origins through the Renaissance, including dramatists, stages, productions, and acting. A few representative plays will be read.

THA 269 Theatre History II (4)
Continuation of THA 268 to the present. Includes a brief look at the theatre of the Orient. A few representative plays will be read.

THA 346 Non-Western Theatre and Dramatic Literature (4)
Identical with LIT 346.

THA 350 Oral Interpretation (4)
Oral expression of literature—prose, poetry, and drama—based on intellectual, emotional, and aesthetic analysis.

THA 362 Technical Design Laboratory (4)
Basic drafting and rendering for stage and costume will be covered as well as development of lighting plots. Twenty hours of work on a major production are required.
Prerequisite: THA 261.

THA 363 Practicum in Rehearsal and Performance (2)
Participation in a student production supervised by a faculty member. Students will maintain a running log, keeping track of their time and continuously evaluating their experiences. Credit is available for on-stage and backstage work. May be repeated for a total of 12 credits.

THA 365 Introduction to Makeup (4)
Theory and practice in theatre makeup.

THA 366 Introduction to Costuming (4)
Theory and practice in theatre costuming.

THA 368 Characterization (4)
Continuation of work on voice, body and concentration. Scene study focusing on the requirements of realistic acting.
Prerequisite: THA 230, THA 267.

THA 420 Improvisation and Theatre Games (4)
Group interaction such as improvisation, simulation, role-playing, sociodrama, creative dramatics, story and readers theatre, and educational games. Includes application of these techniques for group leadership, teaching, and theatre performance.
Prerequisite: THA 267.

THA 430 Advanced Voice and Articulation (4)
Advanced work on voice and articulation with emphasis on vocal requirements of the stage, film, and broadcasting performer. Some work on dialects and accents.
Prerequisite: THA 230 or permission of instructor.

THA 450 Directing Mini-Theatre Forms (4)
Direction and performance in theatre styles requiring minimal sets and appropriate for dinner

theatre, touring shows, special occasions, etc. Includes forms such as: story theatre, chamber theatre, readers theatre, documentary theatre, and media theatre.
Prerequisite: THA 267, 350, or equivalent.

THA 460 Theatre Management for School and Community (4)
Theory and practice in theatre organization and management. Includes publicity and promotion, box office procedures, production budgeting and auditing, house management, play selection, and production organization.
Prerequisite: Junior standing and two THA courses.

THA 462 Directing (4)
Theory and practice in play directing. Includes intensive work on interpretation of the playscript, casting, staging, rehearsal techniques, supervision of technical staff, and directing experience.
Prerequisite: THA 261, 267, and 363.

THA 464 Costume Design (4)
Introduction to costume history, drafting, cutting, and construction, as well as the technique of rendering.
Prerequisite:THA 261, 363, and 366.

THA 466 Advanced Stage Design (4)
The concepts of stage design, rendering, and drafting.
Prerequisite: THA 261, 362, and 363.

THA 467 Advanced Acting (4)
Continuation of work on body, voice and concentration. Focuses on the requirements of various acting and period styles.
Prerequisite: THA 230, THA 267, THA 368 and one course in dramatic literature or THA 268 or THA 269.

THA 480 Special Topics Seminar (4)
Group study of topics of special interest chosen by department faculty and students.
Prerequisite: Three theatre courses.

THA 490 Independent Study (2, 4, or 8)
Special research projects in theatre.
Prerequisite: Three theatre courses and permission of instructor.

THA 491 Internship (4, 8, or 12)
Experience working with professionals in a variety of performing arts settings.
Prerequisite: Three theatre courses and permission of supervising faculty.

THA 497 Apprentice College Teaching (4)
Assisting in teaching an undergraduate course in theatre, and discussions with the supervising faculty member on the principles, methods, and problems of such teaching.
Prerequisite: Junior standing and permission of instructor.

COURSE OFFERINGS IN DANCE

DAN 100 Ballet I (2)
DAN 101 Ballet II (2)
DAN 200 Ballet III (2)
DAN 201 Ballet IV (2)
DAN 300 Ballet V (2)
DAN 301 Ballet VI (2)
DAN 400 Ballet VII (2)
DAN 401 Ballet VIII (2)
Covers the technique of classical ballet in an eight-semester progression. The technique, style, aesthetic interpretation, and historical significance are presented in theory and practice.

DAN 402 Advanced Ballet: Partnering (2)
DAN 403 Advanced Ballet: Pointe and Variation (2)
Taken by ballet majors in conjunction with DAN 400 and 401.

DAN 110 Modern Dance I (2)
DAN 111 Modern Dance II (2)

DAN 210 **Modern Dance III (2)**
DAN 211 **Modern Dance IV (2)**
DAN 310 **Modern Dance V (2)**
DAN 311 **Modern Dance VI (2)**
DAN 410 **Modern Dance VII (2)**
DAN 411 **Modern Dance VIII (2)**
Covers the technique of modern dance in an eight-semester progression. The technique, style, and aesthetic interpretation are presented in theory and practice.

DAN 120 **Jazz Dance I (2)**
DAN 121 **Jazz Dance II (2)**
DAN 220 **Jazz Dance III (2)**
DAN 320 **Jazz Dance IV (2)**
DAN 420 **Jazz Studies: Tap I (2)**
DAN 421 **Jazz Studies: Tap II (2)**
Covers the technique of jazz dance in a six-semester progression. The technique, style, and musical relationships are presented in theory and practice.

DAN 150 **Ballroom Dance (2)**
Theory and technique of ballroom dance from 1900 to the present.

DAN 151 **Folk and Square Dance (2)**
Theory and technique of folk and square dance.

DAN 173 **Dance History and Appreciation (4)**
A historical survey of the development of theatre dance in Western culture. Course materials presented through lecture, discussion, films, slides, and viewing of live dance performances.

DAN 250 **Primitive Dance I (2)**
The study of primitive technique as devised by Katherine Dunham. Integration of African rhythmic dance and Afro-American dance style defines this popular dance form.

DAN 299 **Dance Workshop (1 to 4)**
A workshop designed to give students opportunities for participation in a variety of dance experiences led by performing artists. Normally offered in the spring and summer. Graded S/N.

DAN 330 **Kinesiology for the Dancer (4)**
Analysis of movement from an anatomical and mechanical point of view with emphasis on problems of dance technique. Also includes prevention and treatment of dance-related injuries.
Prerequisite: three dance courses.

DAN 350 **Creative Dance for Children (4)**
Methods and styles of teaching dance to children within schools, community centers, and private studios.
Prerequisite: one dance course.

DAN 351 **Children's Dance Theatre: Rehearsal and Performance (4)**
Choreography, rehearsal, and performance of a dance program for children that tours local elementary schools.
Prerequisite: permission of instructor.

DAN 372 **Choreography I (4)**
Theory of dance composition through reading, discussion, observation, and experimentation.
Prerequisite: One full year of dance.

DAN 373 **Dance for the Musical Theatre (4)**
A practical and theoretical survey of dance within musical theatre from 1900 to the present. Class material presented through actual participation with some discussion of the period and style of dance.
Prerequisite: One dance course.

DAN 376 **Practicum: Dance Rehearsal and Performance (2 or 4)**
A technique- and performance-based laboratory course. Each student will participate in a dance performance during the semester, either as a performer or a choreographer. Four credits are given for performance and choreography and 2 credits for performance only. May be

repeated for a maximum of 8 credits.
Prerequisite: Permission of instructor.

DAN 390 Historical Dance (2)
The study of Baroque, Renaissance, and nineteenth century social dance styles. Course includes practical, theoretical, and historical background.

DAN 470 Elementary Labanotation (4)
An introduction to Laban's system of movement notation.
Prerequisite: 12 credits in dance, including DAN 173.

DAN 472 Choreography II (4)
Continuation of DAN 372 at a more advanced level.
Prerequisite: DAN 372.

DAN 480 Senior Recital (2)
A dance program choreographed and performed by a student in the final year of dance study.
Prerequisites: senior standing, 24 credits in dance including DAN 173, 372, 376, and permission of instructor.

DAN 490 Independent Study (1, 2, or 4)
Permission of instructor. Graded S/N.

DAN 497 Apprentice College Teaching (2 or 4)
Supervised participation in teaching an undergraduate course in dance, together with discussion of teaching methods and objectives.
Prerequisite: Permission of instructor.

SCHOOL OF ECONOMICS AND MANAGEMENT

OFFICE OF THE DEAN
Ronald M. Horwitz, Dean
John E. Tower, Associate Dean
Kathleen G. Clark, Academic Adviser
Timothy W. Smith, Assistant to the Dean

AREA HEADS: *Daniel N. Braunstein (Organizational Behavior, Management, and Marketing),David P. Doane (Economics, Management Information Systems, and Quantitative Methods), David D. Sidaway (Accounting and Finance)*

PROFESSORS: *Eleftherios N. Botsas, Daniel N. Braunstein, Joseph E. Champagne, Karl D. Gregory, Ronald M. Horwitz, Robbin R. Hough, Sid Mittra*

ASSOCIATE PROFESSORS: *David P. Doane, Alice C. Gorlin, Oded Izraeli, Ravi Parameswaran, Alan Reinstein, Martha R. Seger, Miron Stano, John E. Tower*

ASSISTANT PROFESSORS: *Zewdineh Assefa, Lizabeth A. Barclay, Augustine K. Fosu, Paul O. Kingstrom, James E. Mallett, Thomas R. McCarthy, Scott A. Monroe, Gerald V. Post, Howard S. Schwartz, Leonard C. Schwartz, Teri M. Spinelli, Ronald L. Tracy*

INSTRUCTORS: *Elizabeth A. Frederick, Laura A. Stern*

SPECIAL INSTRUCTOR: *David D. Sidaway*

ADJUNCT PROFESSORS: *Paul F. Lorenz, Theodore O. Yntema*

VISITING ASSISTANT PROFESSOR: *Satnarine Heeralall*

VISITING INSTRUCTORS: *Frank P. Cardimen, Steven A. Dickson, Duncan J. Kretovich, Susan E. Moeller, Deborah P. Paruch*

LECTURERS: *Paul Banas, Howard Carlson, David W. Essig, Robert J. Forbes, Richard Heckman, Gary Lorenz, David Medved, Matthew Mendrygal, Douglas R. Munro, Dennis M. Polak, Richard Rappleye, Robert H. Schappe, Thomas Williams, Alan D. Woodell, Gregory Zegarowski*

BOARD OF VISITORS

Recognizing the need for a direct link between the industrial community and the School of Economics and Management, the school established a Board of Visitors in the fall of 1979. The board is comprised of outstanding corporate and professional leaders from the greater Detroit metropolitan area. Board members have been assisting the faculty of the school on several projects and providing consultation on goals and objectives, curricula designs, and research programs.

The members of the board are:

Mr. F. James McDonald, President, General Motors Corporation (Chairman, Board of Visitors)
Mr. James A. Aliber, Chairman of the Board, First Federal Savings and Loan Association of Detroit
Mr. Edward E. Barker, Jr., former Chairman and Chief Executive Officer, Pontiac State Bank
Mr. William E. Giles, former Editor and Vice-President, The Detroit News
Mr. William R. James, Vice-President, Capital Cities Communications
Mr. Kenneth E. Myers, President, William Beaumont Hospital Corporation

Mr. Harold A. Poling, Executive Vice-President, Ford North American Automotive Operations, Ford Motor Company
Mr. Robert H. Robinson, Office Managing Partner, Arthur Young & Company
Mr. Thatcher Root, President, Manley, Bennett, McDonald & Company
Mr. Alan E. Schwartz, Senior Partner, Honigman, Miller, Schwartz and Cohn

UNDERGRADUATE PROGRAMS

The School of Economics and Management offers undergraduate programs for persons interested in obtaining the skills and information necessary for the management of profit-making businesses, not-for-profit enterprises (e.g., health care institutions, educational institutions, cooperative societies), and governmental units. The programs include:

Bachelor of Arts with a major in economics (in cooperation with the College of Arts and Sciences, see page 69 for a description of this program)
Bachelor of Science with a major in economics
Bachelor of Science with majors in:

- Accounting
- Finance
- General Management
- Human Resource Management
- International Management
- Management Information Systems
- Marketing
- Quantitative Methods

Minors (For students earning degrees in other schools and colleges of the university):

- Accounting
- Economics
- Finance
- International Economics
- Management
- Quantitative Methods

THE MASTER OF BUSINESS ADMINISTRATION

For superior undergraduate students in any major, the School of Economics and Management offers the Master of Business Administration (M.B.A.) degree. The M.B.A. is a two-year professional program in management designed for the student who did not major in business or management. Undergraduate management or business majors may be admitted to the M.B.A. program.

For Oakland University undergraduates still working on a major other than one of the management areas, there is the possibility of obtaining both the undergraduate degree and the M.B.A. in an accelerated program. To be eligible, students should have a grade point average in the top 15% of their major. Students should apply for the accelerated program after they have earned a total of 80 credits (see the *Oakland University Graduate Study Catalog*).

COOPERATIVE EDUCATION

Students in the School of Economics and Management who are interested in combining relevant work experience with their college education are encouraged to participate in the university's cooperative education program. A student in the cooperative education program alternates at least two four-month periods of paid, full-time work experience with four-month periods of full-time classwork. Work placements provide jobs that are similar to those which our graduates would hold in business, nonprofit, and governmental organizations. The school, on occasion, also has unpaid internships which provide work experience.

AWARDS AND HONORS

In addition to being eligible for the honors available to all Oakland University undergraduates, majors in the School of Economics and Management are eligible for the following awards and honors:

American Marketing Award: Each year the American Marketing Association, in cooperation with the Detroit Chapter, awards certificates of achievement for scholarship and service to two marketing majors.

Financial Executives Institute Award: This award is presented annually to the undergraduate student majoring in accounting or finance 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. The selection is made by the accounting and finance faculty of the school.

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

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

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

Wall Street Journal Student Achievement Award: This award is presented annually to the graduating senior who has demonstrated the greatest academic and leadership achievement in the school. The selection is made by the faculty.

School Honors are awarded by the School of Economics and Management to students with a minimum grade point average of 3.33 in courses taken from the School of Economics and Management.

REQUIREMENTS FOR THE BACHELOR OF SCIENCE DEGREE

The curriculum described below is effective for students entering the university in the 1983-84 academic year. Students enrolled prior to fall 1983 may opt to satisfy either the degree requirements of this catalog or of the catalog of the academic year in which they entered Oakland University, provided that such catalog is not more than six years old at the time of their graduation. Students who transfer to a major in the School of Economics and Management or who are readmitted to Oakland University will be required to follow the requirements of the catalog in force at the time they transfer or are readmitted. As a check on their preparation for graduation, students are encouraged to have a final program audit with the school's academic adviser the semester before the semester in which they plan to graduate. The responsibility for meeting the graduation requirements rests with the student.

The requirements of the university and the School of Economics and Management to obtain the Bachelor of Science degree are listed below.

I. General Requirements:

To earn the Bachelor of Science degree students must:

A. Complete at least 128 credits;
B. Complete at least 32 credits at Oakland University of which at least 16 credits must be in courses offered by the School of Economics and Management;
C. Complete at least 32 credits at the 300 level or above;
D. Take at Oakland University the last 8 credits needed to complete the baccalaureate requirements;
E. 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 Economics and Management;

F. Obtain certification of writing proficiency as described on page 23 of this catalog;
G. Be admitted to major standing in the major of the student's choice;
H. Complete the requirements for one of the majors in the School of Economics and Management;
I. Be in substantial compliance with all legal curricular requirements.

II. The General Education Requirement

Each school or college of the university establishes its own general education requirements. To earn the Bachelor of Science degree from the School of Economics and Management, students may satisfy the general education requirement by either fulfilling the general education requirement of the Honors College, or by taking 28 credits (36 credits for the Bachelor of Science in economics) distributed as follows:

1. One course from each of the following distribution fields:
   Area Studies
   Arts (art history, cinema studies, dance, music, studio art, theatre)
   History, Philosophy, and Religion
   Literature (English literature or literature in translation)
   Natural Science (biology, chemistry, environmental science, or physics)
   The courses listed in the distribution fields of the College of Arts and Sciences section of this catalog provide a guide to the courses available. Students may choose other courses, for which they have the prerequisites, from the required fields.
2. Two courses in one social science (a 100-level introductory course and a 200-level or higher course) or three courses in different social sciences other than economics. The social science fields available are anthropology, political science, psychology, and sociology (AN, PS, PSY, and SOC).
3. For economics majors only—two courses in the language and thought field as described in the distribution fields of the College of Arts and Sciences.

THE MANAGEMENT PROGRAM

The management program enables graduates to combine an in-depth study of one of the functional areas of business with a broader background in management. This combination will allow the graduate to understand and manage changing situations in either profit-oriented enterprises or in not-for-profit organizations, both public and private. In this program, a general education is combined with the development of rigorous analytical training which will enable the student to find new answers to the increasingly complex and changing problems faced by managers.

The management program offers the student the opportunity to major in general management or in a functional area of management: accounting, finance, human resources management, international management, marketing, management information systems, or quantitative methods. In addition to the majors in management listed above, the school offers a Bachelor of Science in economics. This economics program will be detailed after the descriptions of the management majors.

The individual major programs will be detailed below after a discussion of the precore and core program common to all the management majors.

Management Precore Program

As preparation for the various majors in the business management program, students must successfully complete a minimum of 56 credits in writing, general education, mathematics, computer science, economics, accounting, and statistics courses.

The required precore courses are:

		Credits
1. English Composition:		
RHT 100-101	or complete the writing proficiency requirement in another manner	0-8
2. Mathematics:		
MTH 102/103	College Algebra (if required)	0-4
MTH 121 and	Linear Programming, Elementary Functions	
MTH 122 or	Calculus for the Social Sciences	
MTH 154-155	Calculus	8
3. Computer Science:		
CIS 122, 123 or	BASIC Programming	
CIS 130	Introduction to Computer Science I (Pascal)	4
4. Economics:		
ECN 200 and	Principles of Macroeconomics	
ECN 201 or	Principles of Microeconomics	
ECN 210	Principles of Economics (a six-credit course that covers the material of both ECN 200 and ECN 201)	6-8
5. Accounting:		
ACC 200	Introductory Financial Accounting	4
ACC 210	Managerial and Cost Accounting I	4
6. Statistics:		
QMM 250	Statistical Methods	6
Total Credits		32-46

Suggested Program for the Management Precore

The following should be viewed as an example of an acceptable sequence of courses for the precore program.

First Semester

Freshman Year:

	Credits
RHT 100	4
MTH 121 (MTH 102-103 if necessary)	4
Social science course (100-level)	4
History/philosophy course	4
	16/16

Sophomore Year:

	Credits
ECN 200 (or ECN 210)	4
ACC 200	4
Arts course	4
Social science course (200 level or above or MTH 122)	4
	16/48

Second Semester

	Credits
RHT 101	4
MTH 122 (or MTH 121)	4
CIS 122, 123 or 130	4
Natural science course	4
	16/32

ECN 201 (or a literature course if ECN 210 taken)	4
ACC 210	4
QMM 250	6
Area studies course	4
	18/66

Admission to Management Major Standing

To be eligible to take 400-level courses in the core of the management program or in their major, students must be admitted to major standing in their major. Admission to the management major programs is selective. The minimum requirements for consideration for admission to the management major programs are as follows:

1. Applicant's admissibility to, and retention in, the university.
2. Completion of the writing proficiency requirement.
3. A minimum cumulative grade point average of 2.50 or above in all of the

courses taken in the precore period at Oakland University and at all previous colleges.

4. A minimum grade of 2.0 in each of the following precore courses: MTH 121-122, CIS 122, 123 or 130, ECN 200-201 (or ECN 210), ACC 200, ACC 210, and QMM 250, or their equivalents.
5. Submission of an "Application for Major Standing" for the desired major during the semester in which the student expects to complete the precore requirements.

Students who are denied admission to major standing may try to remedy the deficiencies in their records and reapply, but they cannot take any 400-level courses until they are admitted to major standing in the school. It is university policy that courses can only be repeated twice.

Management Core Program

Each of the major programs in management requires the completion of a common core of courses which introduce students to the functional areas of business. The core courses required in all management major programs are:

		Credits
1. Composition Course:		
ENG 382	Business and Technical Writing (or ENG 380)	4
2. Management Core Courses:		
ECN 301	Intermediate Microeconomics	4
ORG 330	Organizational Behavior I	4
ORG 331	Organizational Behavior II	4
FIN 322	Managerial Finance I	4
MKT 302	Marketing	4
MGT 435	Management Strategies and Policies	4
QMM 443 or	Operations Management	
QMM 440	Management Science	4
		32

MGT 435 is a course that integrates the material in the core program and can only be taken after students have completed the rest of the core program.

Students complete their Bachelor of Science program by taking 16 additional credits or more, as specified in one of the majors in the management program. The available majors are detailed below. The courses in general education, the precore, the business management core, and the major along with any general electives needed to raise the total credits to 128, constitute the program for the Bachelor of Science degree.

Major in Accounting

Major Adviser: *David D. Sidaway*

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

To obtain an accounting major the student must be admitted to major standing in accounting, complete the core program, and complete the 28 credits specified below with a grade of 2.0 or better in each course.

		Credits
Precore courses in accounting:		
ACC 200	Introductory Financial Accounting	4
ACC 210	Managerial and Cost Accounting I	4
Major courses in accounting:		
ACC 311	Intermediate Financial Accounting	4

ACC 312	Advanced Financial Accounting	4

Accounting electives—12 credits from the following:

ACC 410	Managerial and Cost Accounting II	
ACC 411	Auditing	
ACC 412	Government and Not-for-Profit Accounting	
ACC 413	Regulatory Agencies and the Accounting Profession	
ACC 414	Accounting Theory	
ACC 415	Tax Accounting	
ACC 416	Contemporary Issues in Accounting	
ACC 418	Computer-Based Accounting Systems	
ACC 420	Advanced Auditing Topics	
ACC 421	Advanced Tax Topics	
FIN 419	International Accounting and Financial Management	12
		28

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

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

Major in Finance

Major Adviser: *Karl D. Gregory*

The major in finance develops the specific skills, modes of analysis, and institutional information useful in working in the accounting and finance areas of a profit-making business or a not-for-profit enterprise.

To obtain the major in finance, a student must: be admitted to major standing in finance; complete the core program; and complete the 24 credits specified below with a grade of 2.0 or better in each course:

		Credits
Core course in finance:		
FIN 322	Managerial Finance I	4
Major courses in finance:		
ACC 311	Intermediate Financial Accounting	4
ECN 321	Money, Credit, and the Economy	4
FIN 421	Investment Analysis	4
FIN 422	Managerial Finance II	4

Finance elective—one course from the following:

ACC 312	Advanced Financial Accounting	
ACC 410	Managerial and Cost Accounting II	
ACC 415	Tax Accounting	
ECN 356	Public Finance	
ECN 373	International Trade and Finance	
FIN 419	International Accounting and Financial Management	4
		24

Major in Human Resources Management

Major Adviser: *Daniel N. Braunstein*

The major in human resources management develops the requisite skills to administer the various personnel functions in organizations. It is primarily for students who intend to pursue careers where the management of people at work is a central concern (e.g., administration, personnel management, and labor relations). Emphasis is on acquiring an in-depth understanding of the tools and techniques used in the acquisition, development, and utilization of 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 a basic knowledge of organizational behavior.

To obtain the major in human resources management, a student must: be admitted to major standing in human resources management; complete the core program; and complete the 28 credits specified below with a grade of 2.0 or better in each course.

		Credits
Core courses in human resources management:		
ORG 330	Organizational Behavior I	4
ORG 331	Organizational Behavior II	4
Major courses in human resources management:		
MGT 433	Labor-Management Relations	4
ORG 434	Management of Human Resources	4
ORG 430	Organizational Research Methods	4
Human Resources electives—two courses from the following:		
ORG 431	Leadership and Group Performance	
ORG 432	Motivation and Work Behavior	
ORG 436	Decision-Making in Organizations	
ORG 437	Job Design	
ORG 438	Men and Women at Work	
ECN 468	Labor Economics	8
		28

Major in International Management

Major Adviser: *Eleftherios N. Botsas*

The major in international management develops the skills necessary for a manager to analyze management problems in diverse economic, political, social, legal, and market environments. Different accounting methods, exchange rates, regulatory systems, market structures, and the way they affect the behavior and profitability of firms are covered.

Proficiency in a foreign language is not required, but highly recommended.

To obtain the major in international management, the student must: be admitted to major standing in international management; complete the core program; and complete the 20 credits specified below with a grade of 2.0 or better in each course.

		Credits
Major courses in international management:		
ECN 373	International Trade and Finance	4
FIN 419	International Accounting and Financial Management	4
MKT 450	International Marketing	4
MGT 423	The Multinational Firm	4
International management electives—one course from the following:		
ECN 326	Economic Development	
ECN 341	The Soviet Economy	
ECN 350	Comparative Economic Systems	4
		20

Major in General Management

Major Adviser: *Daniel N. Braunstein*

The general management major allows the student to take advanced work in several of the functional areas of management. A student may not double major in general management and another major in the School of Economics and Management.

To obtain the major in general management, a student must: be admitted to major standing in general management; complete the core program; and complete any 16 credits in electives from the School of Economics and Management (ACC, ECN, FIN, MGT, MIS, MKT, ORG, or QMM) with a 2.0 or better in each course. These electives must be chosen from courses numbered 300 or higher and at least 8 credits must be at the 400-level. No more than 4 credits of independent study (490 courses) may be used to meet the major elective requirement.

Major in Management Information Systems

Major Adviser: *David P. Doane*

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

To obtain the major in management information systems, a student must: be admitted to major standing in management information systems; complete the core program; and complete the 24 credits specified below with a grade of 2.0 or better in each course.

		Credits
Precore course in management information systems:		
CIS 130	Introduction to Computer Science I (Pascal—instead of CIS 122 or 123)	
Major courses in management information systems:		
CIS 220	Computer-Based Information Systems I (COBOL)	4
CIS 131	Introduction to Computer Science II (PL/1)	4
MIS 307	Management Information Systems	4
MIS electives—two courses, at least one of which is a 400-level MIS course, from the following:		
CIS 221	Computer-Based Information Systems II	
CIS 280	Introduction to Computer Organization and Assembly Programming	
CIS 340	File Systems Design	
CIS 342	Introduction to Information Structures	
CIS 445	Database Systems	
MIS 316	Systems Analysis	
MIS 400	Analysis of Complex Systems	
MIS 407	Computer Systems for Problem Solving	
MIS 444	Simulation in Management	
ACC 418	Computer-Based Accounting Systems	
QMM 452	Forecasting	8
		24

Major in Marketing

Major Adviser: *Ravi Parameswaran*

The major in marketing develops the specific skills, modes of analysis, and institutional information useful in working in the marketing area of a profit-making business or not-for-profit enterprise.

To obtain the major in marketing, a student must: be admitted to major standing in marketing; complete the core program; and complete the 24 credits specified below with a grade of 2.00 or better in each course.

		Credits
Core course in marketing:		
MKT 302	Marketing	4
Major courses in marketing:		
MKT 353	Marketing Management	4
MKT 404	Consumer Behavior	4
MKT 405	Marketing Research	4
Marketing electives—two courses from the following:		
MKT 406	Promotional Strategy	
MKT 420	Distribution Channels Management	
MKT 430	Sales Management/Sales Promotion	
MKT 450	International Marketing	
MKT 480	Seminar in Marketing	8
		24

Major in Quantitative Methods

Major Adviser: *David P. Doane*

The major in quantitative methods further develops the student's skills in statistics, computer analysis, and production management. The objective of this program is to provide the student with the extra technical abilities needed to cope with the rapidly changing technology facing business today. This program will prepare students for a range of entry-level positions in businesses or not-for-profit organizations that require statistical and quantitative skills.

To obtain the major in quantitative methods the student must: be admitted to major standing in quantitative methods; complete the core program; and complete the 30 credits specified below with a grade of 2.0 or better in each course.

		Credits
Precore courses in quantitative methods:		
CIS 130	Introduction to Computer Science I (Pascal—instead of CIS 122 or 123)	4
QMM 250	Statistical Methods	6
Core (course in quantitative methods)—choice of one of the following:		
QMM 443	Operations Management	
QMM 440	Management Science	4
Major courses in quantitative methods:		
CIS 131	Introduction to Computer Science II (PL/1)	4
Choice of one of the following:		
ECN 405	Econometrics	
QMM 452	Forecasting	4
Quantitative methods electives—two courses from QMM not previously taken or from:		
QMM 308	Project Management Techniques	
MIS 444	Simulation in Management	
STA 323	Design of Experiments	
STA 324	Data Analysis	
SOC 403	Computer Packages in Social Science	
MOR 342	Introduction to Operations Research	
MOR 346	Stochastic Models in Operations Research	8
		30

BACHELOR OF SCIENCE WITH A MAJOR IN ECONOMICS

Major Adviser: *David P. Doane*

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. The student learns how economic analysis can be applied to major problems facing individuals, businesses, the nation, and the world today.

An education in economics is excellent preparation for entry into law schools, graduate schools of public administration or management, or a Master of Business Administration (M.B.A.) program. Economics is a flexible choice for the student seeking a rigorous, well-respected, and relevant major without specializing in a narrowly defined area. To be employed as a professional economist or to teach economics, a student normally will need to proceed to graduate school and obtain at least a master's degree in economics and preferably a doctorate.

The bachelor of science degree offers a more quantitative approach to economics than the bachelor of arts major in economics described in the College of Arts and Sciences.

Requirements for the Bachelor of Science with a Major in Economics

		Credits
1. English Composition:		
RHT 100-101	Composition I-II or complete the writing proficiency in another manner.	0-8
ENG 382	Business and Technical Writing (or ENG 380)	4
2. General education as detailed for the Bachelor of Science degree by the School of Economics and Management, including eight credits in the language and thought field as described by the College of Arts and Sciences		36
3. To obtain a further background in mathematics, computers, accounting, finance, and quantitative methods, the economics major must complete the following cognate courses:		
MTH 102/103	College Algebra (if necessary)	0-4
MTH 121 and	Linear Programming, Elementary Functions	
MTH 122 or	Calculus for the Social Sciences	
MTH 154-155	Calculus	8
CIS 122 or 123	BASIC Programming	
or CIS 130	Introduction to Computer Science I (PASCAL)	4
ACC 200	Introductory Financial Accounting	4
QMM 250	Statistical Methods	6
FIN 322	Managerial Finance I	4
Quantitative methods course: choice of one of the following -		
MIS 444	Simulation in Management	
QMM 440	Management Science	
QMM 443	Operations Management	
QMM 452	Forecasting	4
4. The required core courses for the economics major are:		
ECN 210 or	Principles of Economics (a six-credit course that covers the material of both ECN 200 and ECN 201)	
ECN 200 and	Principles of Macroeconomics	
ECN 201	Principles of Microeconomics	6-8
ECN 301	Intermediate Microeconomics	4
ECN 302	Intermediate Macroeconomics	4

ECN 405	Econometrics	4
ECN 418	Seminar in Economic Policy	4
or ECN 480	Seminar in Economic Theory	

5. Economics Electives: The economics elective requirement is 16 additional credits in courses numbered ECN 300 or higher. Eight of these economics credits must be in courses numbered ECN 400 or higher. No more than four credits in ECN 490 may be counted as economics electives. 16
6. General electives 6-20

128

Economics Precore Program

The following should be viewed as an example of an acceptable sequence of courses for the economics precore program.

First Semester		Second Semester	
Freshman Year:			
	Credits		Credits
RHT 100	4	RHT 101	4
MTH 121 (MTH 102-103 if necessary)	4	MTH 122 (or MTH 121)	4
Social science course (100-level)	4	Natural science course	4
History/philosophy course	4	CIS 122, 123, or 130	4
	16/16		16/32
Sophomore Year:			
ECN 210 (or ECN 200)	6	Language and Thought course (or ECN 201 if ECN 200 taken)	4
ACC 200	4	QMM 250	6
Arts course	4	Area studies course	4
Language and Thought course (or MTH 122)	4	Social science course	4
	18/50		18/68

Admission to Major Standing in Economics

Admission to major standing for the Bachelor of Science in economics requires:

1. Certification of writing proficiency.
2. Completion of the following courses, or their equivalents, with a grade of 2.0 or better in each course: MTH 121-122, CIS 122, 123 or 130, ECN 210 (or ECN 200-201), and QMM 250.
3. Completion of 56 credits or more with a cumulative overall grade point of 2.50 or better.
4. Approval of an "Application for Major Standing."

Admission to major standing in economics is required before a student may take 400-level courses and graduate.

Although ECN 301 and ECN 302 are not required for major standing, the major in economics must obtain a grade of 2.0 or better in both ECN 301 and ECN 302 to graduate.

MINORS FOR NON-MANAGEMENT STUDENTS

For students in majors outside of the School of Economics and Management who wish to combine their major with an introduction to the skills, analytical techniques, and institutional material of economics or one of the areas of business, the school offers the following minors. To obtain one of these minors, students must complete the courses in the minor with an average grade of 2.00 or better. Students from major programs outside the School of Economics and Management may take

300-level courses in the school if there is space after the school's majors have been accommodated.

All students who are not majors in the School of Economics and Management, whether they have applied for a minor or not, are limited to a maximum of 28 credits in business courses at Oakland University or at other schools, excluding the basic economics courses, i.e., they may not take a total of more than 28 credits in ACC, ECN, FIN, MGT, MIS, MKT, ORG, or QMM courses (excluding ECN 150, ECN 200-201, and ECN 210). Majors in the School of Economics and Management may not take any of the following minors. Students may take only one minor in the School of Economics and Management.

Transfer students are required to take 12 credits in the minor at Oakland University and at least 8 of the 12 credits at Oakland University must be in 300-level courses or higher.

Minor in Accounting

Coordinator: *David D. Sidaway*

The minor in accounting consists of the following 20 credits:

		Credits
ACC 200	Introductory Financial Accounting	4
ACC 210	Managerial and Cost Accounting I	4
Twelve additional credits in accounting (ACC) courses for which the student has the prerequisites		12
		20

Minor in Economics

Coordinator: *David P. Doane*

The minor in economics consists of a minimum of 18 credits as follows:

		Credits
ECN 150 or	Basic Economics	
ECN 210 or	Principles of Economics	
ECN 200 and	Principles of Macroeconomics	
ECN 201	Principles of Microeconomics	4-8
Twelve additional credits in economics (ECN) courses for which the student has met the prerequisites (16 additional credits if the student took ECN 150).		12-16
		18-20

Minor in Finance

Coordinator: *Karl D. Gregory*

The minor in finance consists of the following 22 credits and any prerequisites required to take these courses:

		Credits
ACC 200	Introductory Financial Accounting	4
QMM 250	Statistical Methods	6
FIN 322	Managerial Finance I	4
Eight additional credits of finance (FIN) courses.		8
		22

Minor in International Economics

Coordinator: *Eleftherios N. Botsas*

The minor in international economics consists of a minimum of 18 credits as follows:

		Credits
Second-year proficiency in a foreign language.		
ECN 210 or	Principles of Economics	
ECN 200* and	Principles of Macroeconomics	
ECN 201	Principles of Microeconomics	6-8
ECN 373	International Trade and Finance	4
MGT 423	The Multinational Firm	4
Choice of one of the following courses:		4
ECN 326	Economic Development	
ECN 341	The Soviet Economy	
ECN 350	Comparative Economic Systems	
		18-20

Minor in Management

Coordinator: *Leonard C. Schwartz*

The minor in management consists of a minimum of 22 credits as follows:

		Credits
ECN 210 or	Principles of Economics	
ECN 200* and	Principles of Macroeconomics	
ECN 201	Principles of Microeconomics	6-8
ACC 200	Introductory Financial Accounting	4
ORG 330	Organizational Behavior I	4
Eight additional credits of SEM 300- or 400-level electives (ACC, FIN, MGT, MIS, MKT, ORG, QMM courses) for which the student has the prerequisites.		8
		22-24

Minor in Quantitative Methods

Coordinator: *David P. Doane*

The minor in quantitative methods consists of a minimum of 20 credits as follows:

	Credits
Statistics course (QMM 250, STA 226, or SYS 317)	4-6
Eight additional credits of quantitative methods (QMM) courses	8
Eight additional credits of quantitative methods or management information systems (QMM, MOR, MIS, or STA) courses.	8
	20-22

*ECN 150 can be substituted for ECM 200 in the minors

COURSE OFFERINGS

The following are the descriptions of required and elective courses offered in the past three years by the School of Economics and Management. The required precore and core courses for majors in the school (ACC 200, ACC 210, ECN 200-201, FIN 322, MGT 435, MKT 302, ORG 330-331, QMM 250, and QMM 440 or QMM 443) are normally offered each fall and winter semester and either in the spring or summer session.

The 300-level courses should be taken in the junior year (59-60 credits). The 400-level courses are designed for majors in the School of Economics and Management. Nonmajors may elect these 300- and 400-level courses if they meet the prerequisites and if there is space in the class after the majors have been accommodated. All students who are not majors in the School of Economics and Management are limited to a maximum of 28 credits in business courses at Oakland University or at other schools, excluding the basic economics courses, i.e., they may not take more than 28 credits in ACC, ECN, FIN, MGT, MIS, MKT, ORG, and QMM courses (excluding ECN 150, ECN 200-201, and ECN 210).

Accounting (ACC)

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, derive financial statements, and analyze data presented in published financial reports.
Prerequisite: Sophomore standing.

ACC 210 Managerial and Cost Accounting I (4)
Analysis of accounting methods providing data for optimal managerial decisions, implementation, and control. Topics include cost allocation; cost, volume, and price relationship; product cost accounting and control systems; operations and capital budgeting; and related behavioral, reporting, and information processing aspects.
Prerequisite: ACC 200.

ACC 311 Intermediate Financial Accounting (4)
Study of financial accounting and reporting problems. Generally accepted accounting principles applicable to investments, inventories, productive resources, and debt and equity capital issues will be discussed. Emphasis is on providing useful information to external financial statement users.
Prerequisite: ACC 200 and ACC 210.

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

ACC 410 Managerial and Cost Accounting II (4)
An analysis of available procedures and techniques to sharpen accounting analyses for managerial planning and control. Extends subjects introduced in ACC 210 to nonmanufacturing firms and decentralized firms, including transfer pricing and segment performance measurement.
Prerequisite: Major standing, ACC 210, and QMM 440 or QMM 443.

ACC 411 Auditing (4)
Introduction to the objectives, techniques, and standards of internal and external audits of the accounts of an enterprise. Generally accepted auditing standards will be critically examined.
Prerequisite: Major standing and ACC 312.

ACC 412 Government and Not-for-Profit Accounting (2)
The characteristics of not-for-profit entities are analyzed and used to define the basic concepts of accounting for funds. Accounting and reporting principles applicable to governmental units, hospitals, schools, eleemosynary and other nonprofit entities are discussed.
Prerequisite: Major standing and ACC 311.

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

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

ACC 415 Tax Accounting (4)
The concepts of taxation. The essential logic underlying the federal tax laws will be developed. The class will analyze individual and corporate income tax laws rather than train students to prepare current-year tax returns.
Prerequisite: Major standing and ACC 312.

ACC 416 Contemporary Accounting Issues (4)
An examination of the changes in accounting associated with infusions of theories of other disciplines: behavioral science, organizational theory, economic theory, and sociology. Also

considered are changes in the role of the accountant. The course may be repeated.
Prerequisite: Major standing and ACC 312.

ACC 418 Computer-Based Accounting Systems (4)
Examination of computer applications in accounting integrated with inventory control and related sales data processing. Internal security, auditing, and control features are stressed. Covers computer hardware, software, and data systems analysis.
Prerequisite: Major standing and MIS 307 or MIS 316.

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

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

ACC 490 Independent Study (2 or 4)
Qualified and highly motivated students may engage in independent individual research, directed readings, or group independent study, under the supervision of a faculty member. Offered every term.
Prerequisite: An overall grade point average of 3.00 or better, major standing, and an approved contract prior to registration.

Economics (ECN)

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 management.
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.
Prerequisite: High school algebra and sophomore standing.

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

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

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

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

ECN 309 Urban Economic Problems (4)
Survey of contemporary urban economic problems, location and migration patterns, local public services and public finance in politically fragmented metropolitan areas, urban poverty and crime, housing, blight and renewal, quality of life, and transportation.
Prerequisite: ECN 150 or ECN 201 or ECN 210.

ECN 310 Economics of the Environment (4)
Application of the tools of economic analysis to problems of energy, ecology, and the environment. Topics include: externalities and public goods; optimum use of fixed national resources; the limits to economic growth and ecological aspects of principal pollution problems.
Prerequisite: ECN 150 or ECN 201 or ECN 210.

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

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

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

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

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

ECN 347 Problems in Health Economics (4)
Survey of problems of the health care industry, nature of the demand for health care services, patterns in resource allocation and provision of health care services, and government health care policy and its impact.
Prerequisite: ECN 150 or ECN 201 or ECN 210.

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

ECN 356 Public Finance (4)
The role and impact of the public sector in a market economy. Includes: expenditure determination; the basis for taxation in terms of equity, efficiency, and flexibility; timing of cash flows; revenue source analysis; financing public debt; and discussion of current problems.
Prerequisite: ECN 201 or ECN 210 or permission of instructor.

ECN 373 International Trade and Finance (4)
International trade theory, the international monetary mechanism, exchange-rate regimes, the balance of payments, and economic interdependence.
Prerequisite: ECN 201 or ECN 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 ECN 210 or permission of instructor.

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

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

ECN 409 Urban Economics (4)
Survey of urban economics, location theory, and migration patterns. Includes analysis of local public services and public finance, housing, quality of life, transportation, and employment patterns.
Prerequisite: Major standing and ECN 301.

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

ECN 418 Seminar in Economic Policy (4)
Analysis of economic policy. Topics vary but may include: resource allocation, macroeconomic stability, economic growth, energy, public choice, global economic interdependence, and the environment.
Prerequisite: Major standing, ECN 301, and ECN 302.

ECN 467 Economics of Health Care (4)
Application of the tools of economic analysis to the health care industry and government health care policy. Examines the impact of the special characteristics of health care and the medical services industry on the pattern of health care produced, its distribution, and resource allocation within the industry.
Prerequisite: Major standing and ECN 301.

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: Major standing and ECN 301.

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

ECN 490 Independent Study (2 or 4)
Qualified and highly motivated students may engage in independent individual research, directed readings, or group independent study, under the supervision of a faculty member. Offered every term.
Prerequisite: An overall grade point average of 3.00 or better, major standing, and an approved contract prior to registration.

Finance (FIN)

FIN 320 Personal Financial Management (4)
The student is viewed as a business manager, responsible for all personal financial affairs. Topics include estate planning, retirement, insurance, investment, savings, and credit.
Prerequisite: ECN 201.

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

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

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

FIN 422 Managerial Finance II (4)
The application of the tools of financial analysis to specific cases in the financial management of corporate businesses and not-for-profit enterprises.
Prerequisite: Major standing and FIN 322.

FIN 490 Independent Study (2 or 4)
Qualified and highly motivated students may engage in independent individual research, directed readings, or group independent study, under the supervision of a faculty member. Offered every term.
Prerequisite: An overall grade point average of 3.00 or better, major standing, and an approved contract prior to registration.

Management (MGT)

MGT 316 Ethics, Economics, and Business (4)
Ethical problems in business practices and institutions, and critical analysis of the concepts, presuppositions, and theories used in the description and explanation of economic phenomena. Identical with PHL 316.
Prerequisite: One course in philosophy or economics.

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

MGT 424 Business Law (4)
The study of the legal framework in which business decisions are made and the types of economic conflict and political activity that have created this framework. Topics include: contracts, anti-trust legislation, conflict resolution, and regulatory agencies.
Prerequisite: Major standing.

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

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

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

MGT 490 Independent Study (2 or 4)
Qualified and highly motivated students may engage in independent individual research, directed readings, or group independent study, under the supervision of a faculty member. Offered every term.
Prerequisite: An overall grade point average of 3.00 or better, major standing, and an approved contract prior to registration.

Management Informations Systems (MIS)

MIS 307 Management Information Systems (4)
Examination of the development and operation of information systems in organizations. Topics include: information economics, management uses of information, alternative designs of information systems, data base concepts, management of the information system, telecommunications, and data security.
Prerequisite: ECN 301 and CIS 122, 123, or 130.

MIS 316 Systems Analysis (4)
Identifying goals, visualizing overall processes, and creatively designing approaches which effectively use resources to achieve desired ends. Draws upon quantitative, computer, and general skills available to the student.
Prerequisite: ECN 301 and CIS 122, 123, or 130, or permission of instructor.

MIS 400 Analysis of Complex Systems (4)
Modeling, instrumentation, and control of complex systems. Emphasizes design, implementation, and testing of information and control systems in unstructured and realistic contexts. Includes specification, evaluation, and selection of hardware and software systems, ranging from applications in microcomputers to large-scale computers.
Prerequisite: Major standing, ECN 301, and MIS 307 or MIS 316.

MIS 407 Computer Systems for Problem-Solving (4)
An advanced communications and problem-solving course in which students learn to specify and design systems for computers. Consists of field studies by teams of students leading to computerized solutions of "real-world" problems.
Prerequisite: Major standing, MIS 307, and 12 credits in higher-level programming languages.

MIS 444 Simulation in Management (4)
Computer simulation models using GPSS or an equivalent simulation language, plus simulation exercises using standard programming languages. Implications of models and sensitivity analysis for forecasting, planning, and decision-making in the management environment are explored.
Prerequisite: Major standing and MIS 307.

MIS 490 Independent Study (2 or 4)
Qualified and highly motivated students may engage in independent individual research, directed readings, or group independent study, under the supervision of a faculty member. Offered every term.
Prerequisite: An overall grade point average of 3.00 or better, major standing, and an approved contract prior to registration.

Marketing (MKT)

MKT 302 Marketing (4)
Analysis of the principles of marketing, marketing concepts and trends, and their relationship to other business principles. Special emphasis is placed on the study of the marketing mix.
Prerequisite: ECN 210 or ECN 201.

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

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 on buying behavior including learning, motivation, attitude, personality, small groups, demo-

graphic and economic factors, and culture.
Prerequisite: Major standing and MKT 353.

MKT 405 Marketing Research (4)
Focus 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: Major standing and MKT 353.

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: Major standing and MKT 353.

MKT 420 Distribution Channels Management (4)
Examination of the management of marketing channel relationships. Focus on the characteristics and social, economic, and political relationships among wholesalers, agents, retailers, and the other agencies that comprise the distribution channels.
Prerequisite: Major standing and MKT 353.

MKT 430 Sales Management/Sales Promotion (4)
Examination of the function of sales management. Emphasis on the role of analysis, decision-making, strategy formation, and the impact of the "suction," or pull strategy provided by sales promotion.
Prerequisite: Major standing and MKT 353.

MKT 450 International Marketing (4)
The application of marketing principles to problems associated with the marketing of products and services in different nations. Cases in international marketing will be analyzed.
Prerequisite: Major standing, MKT 353, and ECN 373.

MKT 480 Seminar in Marketing (4)
Study of a selected topic or current marketing interest relevant to the management of the marketing function. Topics may include: industrial marketing, retail management, or any area not covered by a specific course.
Prerequisite: Major standing and MKT 353.

MKT 490 Independent Study (2 or 4)
Qualified and highly motivated students may engage in independent individual research, directed readings, or group independent study, under the supervision of a faculty member. Offered every term.
Prerequisite: An overall grade point average of 3.00 or better, major standing, and an approved contract prior to registration.

Organizational Behavior (ORG)

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

ORG 331 Organizational Behavior II (4)
Applications of organizational behavior theory to management. Management's role in designing, supervising, and changing work behavior in organizations will be examined in the light of the organizational behavior literature.
Prerequisite: QMM 250 and ORG 330.

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

ORG 430 Organizational Research Methods (4)
Use of various behavioral research strategies as input for managerial problem-solving. Review

of various methods of individual and organizational measurement devices, including industrial tests, morale surveys, etc.
Prerequisite: Major standing and ORG 331.

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 which involve leadership behavior and group functioning.
Prerequisite: Major standing and ORG 331.

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: Major standing and ORG 331.

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

ORG 436 Decision-Making in Organizations (4)
An examination of different models and theories concerning decision-making in organizations. Individual, group, and organizational decision-making activities are analyzed and implications for management are drawn.
Prerequisite: Major standing and ORG 331.

ORG 437 Job Design (4)
Examination of the impact of job and organizational design strategies. The course will review and compare the "quality of work life," socio-technical systems, behavioral modification, and organizational development approaches.
Prerequisite: Major standing and ORG 331.

ORG 438 Men and Women at Work (4)
An investigation into the roles of men and women at work. Topics include: the labor force participation rates of men and women; historical and current perspectives of work roles, and the relevance of theory for the design of organizations and for human resource management.
Prerequisite: Major standing or permission of instructor.

ORG 490 Independent Study (2 or 4)
Qualified and highly motivated students may engage in independent, individual research, directed readings, or group independent study, under the supervision of a faculty member. Offered every term.
Prerequisite: An overall grade point average of 3.00 or better, major standing, and an approved contract prior to registration.

Quantitative Methods for Management (QMM)

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

QMM 308 Project Management Techniques (4)
An examination of the various math-based techniques for managing projects. The topics include Program Evaluation Review Technique (PERT) and Crticial Path Method (CPM).
Prerequisites: MTH 122 and QMM 250.

QMM 440 Management Science (4)
Overview of models and applications of management science. Includes: acceptance sampling, statistical quality control, decision analysis, Bayesian analysis, inventory models, PERT and

CPM, queueing models, simulation, and linear programming.
Prerequisite: Major standing and ECN 301.

QMM 443 Operations Management (4)
Analysis of problems and case studies in production management in general manufacturing and service industries. Management science methods will be used to solve problems of inventory management, material control, acceptance sampling, quality control, plant and equipment investment, facility location, and operations scheduling.
Prerequisite: Major standing.

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

QMM 490 Independent Study (2 or 4)
Qualified and highly motivated students may engage in independent individual research, directed readings, or group independent study, under the supervision of a faculty member. Offered every term.
Prerequisite: An overall grade point average of 3.00 or better, major standing, and an approved contract prior to registration.

SCHOOL OF ENGINEERING AND COMPUTER SCIENCE

OFFICE OF THE DEAN

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Howard R. Witt, Associate Dean
Carl T. Isaacs, Adviser
Gregory P. Knoff, Assistant to the Dean
Frederick J. Lutz, Engineering Cooperative Education Coordinator
Kenneth A. Meade, Adviser

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ASSISTANT PROFESSORS: *Hoda S. Abdel-Aty-Zohdy, Osman D. Altan, Bhushan L. Bhatt, Robert P. Judd, Brian P. Sangeorzan, Christian C. Wagner, Mohamed A. Zohdy*

SPECIAL INSTRUCTOR: *Jerry Marsh*

ADJUNCT PROFESSORS: *Martin A. Erickson, Michael Marcotty, Kenneth A. Meade*

ADJUNCT ASSOCIATE PROFESSORS: *Ronald R. Beck, George W. Buckley, Mark M. Shamamy*

ADJUNCT ASSISTANT PROFESSORS: *Frank W. Bliss, Susanne M. Gatchell, Steven L. Plee, Ranjit K. Roy*

BOARD OF VISITORS

The Board of Visitors for the School of Engineering and Computer Science is composed of leaders in industry. They assist the School of Engineering and Computer Science 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:

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PROGRAMS

The Oakland University School of Engineering and Computer Science is an interdisciplinary oriented academic unit that offers programs leading to the degree of Bachelor of Science in engineering in computer, electrical, mechanical and systems engineering, and to the degree of Bachelor of Science in computer and information science. In addition, programs in engineering chemistry and engineering physics that lead to the Bachelor of Science degree are offered jointly with the College of Arts and Sciences.

Oakland University's engineering programs prepare students for a career in an industrial-based society. Recognizing that today's engineer must be able to solve complex problems transcending narrow categories as well as specialized problems, the engineering programs blend an interdisciplinary core with specialized study in the elected major. Oakland University graduates are prepared to enter the traditional fields of government, product design, development, manufacturing, sales, service and systems analysis, as well as newer areas of application such as robotics, transportation, pollution control, energy systems, computer and information processing, medical electronics and automotive electronics, or to pursue graduate study for research and teaching careers. A growing number of students also find that their undergraduate engineering education is excellent preparation for careers in business, law, and medicine.

The baccalaureate program in computer and information science provides a solid foundation for a career in computer science. The digital computer has assumed a central role in society and has become an important tool in nearly all phases of business, health care systems, energy, commerce, industry, education, and research. Thus, persons interacting with computers have diversified complementary interests. To meet these employment needs Oakland's computer and information science program encourages a broad outlook and multidisciplinary viewpoint. It balances the practical with the abstract in providing the requisite technological training. A broad educational experience is insured by requiring completion of a minor in a related field and a general education component.

Oakland University offers an optional Cooperative Plan of Education to qualified engineering and computer and information science students. Prior to participating under this plan a student must complete the first two years of his/her selected major on a regular schedule. Beginning with the junior year the cooperative education student alternates four-month semesters of full-time study with equal periods of meaningful full-time employment in business, industry, or government. The employment provides practical training which must be related to the student's field of study and forms an integral part of the educational program. It provides the immediate benefits of permitting the student to relate academic studies to practical applications as well as to have early contact with practitioners in the field. The program coordinator and the employer work together to ensure that the

practical training becomes progressively more challenging and carries increasingly greater responsibilities as the student advances through the curriculum. Admission requirements and program conditions are detailed on page 224.

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

Programs leading to the degrees of Master of Science and Doctor of Philosophy are available in the school. These degree programs are detailed in the *Oakland University Graduate Study Catalog.*

ACCREDITATION

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

PREPARATION FOR ADMISSION

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

A student planning to transfer into one of the engineering programs should present the following: four semester courses in analytic geometry and calculus including linear algebra and differential equations; two semester courses in introductory college physics using the calculus; and one or two courses in college chemistry. Other credits in mathematics, science, or engineering will be evaluated with reference to courses required for graduation in the Oakland University engineering curriculum. Technician course credits do not generally apply to these requirements.

Community college students who plan to transfer into an engineering program are advised to take the engineering transfer program as prescribed by the Michigan Engineering College-Community College Liaison Committee. A brochure describing this transfer program is available from any community college or the School of Engineering and Computer Science. Generally, community college graduates with the associate degree have satisfied the general education requirements of Oakland University's School of Engineering and Computer Science.

A student planning to transfer into the computer and information science program should complete one year of course work in calculus and a course in linear algebra. One course in programming in a high-level language such as PASCAL or PL/1 and one in computer organization and assembly programming are desirable. If possible, further course work in computer science should be planned in advance with an adviser at Oakland University to ensure compatibility with our requirements.

ACADEMIC POLICIES OF THE SCHOOL OF ENGINEERING AND COMPUTER SCIENCE

Transfer Policy

The programs offered by the School of Engineering and Computer Science are designed to meet accreditation criteria as well as to reflect the Oakland University

philosophy of an education. Thus, it is emphasized that the programs are more than a mere assemblage of courses. They seek to integrate the fundamental mathematical and scientific background into advanced analysis and design work through a careful blending of theory and experiment to produce a meaningful educational experience. 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 University students are expected to complete all remaining course work for their degree at Oakland University. Exceptions which permit taking courses at another institution must have the prior written consent of the associate dean of engineering and computer science. A student who has completed 62 semester hours of credit from any accredited institution(s), including Oakland University may not transfer additional credits from a community or junior college.

Internal Transfer

Applications from students wishing to transfer into programs in the School of Engineering and Computer Science from other majors or from undecided status within Oakland University will be considered upon completion of the following course work.

Engineering programs: MTH 154-155 Calculus and PHY 151-152 Introductory Physics

Computer and information science program: MTH 154-155 Calculus and CIS 130-131 Introduction to Computer Science

Plan of Study

Each student in the school is assigned an adviser who should be consulted regularly for assistance in planning a program of study. Engineering and computer and information science majors are encouraged to complete a Plan of Study form, which is a timetable of courses to be taken for undergraduate credit. It should be submitted no later than the end of the semester in which the student completes 48 credits. Transfer students should submit a Plan of Study when they enter Oakland University, regardless of the number of credits they already have earned. The student completes the form in consultation with his/her adviser, and it is then approved by the dean's office. The student is responsible for updating the plan regularly, preferably each semester. Although advisers are obligated to assist students in planning their programs, the responsibility for fulfilling degree requirements remains with the student.

Work Load

Students are referred to page 25 of this catalog for details of allowable course load. It is important for students to strike a balance between course load and other commitments. To carry a full load of 16 credits per semester a student should not be employed for more than 20 hours per week. A student employed 40 hours per week should not carry a course load of more than 4 credits per semester.

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 quality point average of at least 2.00 in courses required a) within the major, b) in cognate mathematics and science courses, and c) in all courses taken at Oakland University.

The quality point average is determined by dividing the honors points a student has earned by the hours elected, with N and WN grades included and assigned 0 honor points. Students who fall below 2.00 in cumulative quality point average in one or more of the three designated categories will be placed in provisional status by the School of Engineering and Computer Science. A student may also be warned for unsatisfactory progress as determined from an excess of substandard grades, inconsistent academic performance, or erratic attendance.

While in provisional status a student must have his/her program of study approved by the associate dean of engineering and computer science. If a student fails to remove the provisional conditions after one semester, generally he/she will be ineligible to continue in programs of the School of Engineering and Computer Science. Provisional status may be continued if the student is judged to be making substantial progress toward early removal of his/her deficiency. For part-time students a semester will be considered to be 12 consecutive credits of course work attempted. A student ineligible to continue in the school may be permitted to enroll in another school or college within the university.

Students on provisional status may not serve on School of Engineering and Computer Science committees.

The above rules have been established by the committee on instruction of the school. Students wishing to appeal a ruling regarding their academic status within the school must address a written petition to the committee on instruction.

Unsatisfactory Performance

Grades of N, WN, and numerical grades less than 2.0 are considered substandard.

A course in which a grade of N, WN, or below 2.0 has been earned may not be subsequently passed by competency examination or independent study.

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.

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 they will be liable for any financial penalties that this incurs.

Independent Study and Project Courses

Independent study and project courses CIS 294, 490, 494, and EGR 290, 294, 490, 494 are available to provide enrichment opportunities for qualified students. They are not intended to substitute for regular course offerings, but rather to allow students to investigate an area of interest outside the scope of regular courses, to examine a subject more deeply than can be accommodated in regular courses, or to gain an educational experience beyond that of regular course work. To be permitted to register in an independent study or project course a student must have submitted a meaningful plan of work and have the approval of a faculty member who will supervise it and the associate dean of engineering and computer science. Application forms are available in the Office of the Dean, 248 Dodge Hall.

Academic Conduct

It is expected that students will abide by the principles of truth and honesty which are essential to fair grading. Academic misconduct in any form is not permitted in the School of Engineering and Computer Science. If a student is found

guilty of academic misconduct by the university academic conduct committee, in any course offered by the school, then in addition to the penalties imposed by the committee, the instructor may assign penalties from a reduced grade for the assignment to a grade of N for the entire course.

It should be noted that all assignments must be the independent work of each student, unless the professor in charge gives explicit permission relaxing such a requirement.

For a detailed description of the university academic conduct policy students are referred to the *Schedule of Classes*, the *Oakland University Student Handbook*, or page 28 of this catalog.

Petitions

Waiver of a specific academic requirement may be initiated by submission of a petition of exception as described on page 26 of this catalog.

A student seeking a review of his/her academic standing within the school or who wishes to grieve a matter should submit a written petition to the associate dean of engineering and computer science for handling according to the established procedures.

DEGREE REQUIREMENTS AND REGULATIONS

General Requirements for the Degrees of Bachelor of Science in Engineering and Bachelor of Science

The following general requirements must be met by a student seeking the baccalaureate in computer engineering, electrical engineering, mechanical engineering, systems engineering, engineering chemistry, engineering physics or computer and information science.

1. Have completed at least 128 credits for all engineering programs and at least 124 credits for the computer and information science program. At least 32 credits must be in courses at the 300-level or above.
2. Have completed at least 32 credits at Oakland University. (Refer to the transfer policy of the School of Engineering and Computer Science for further clarification.) For a student majoring in :
   a) computer, electrical, mechanical, or systems engineering, at least 24 credits must be in engineering core or professional subjects required for the major.
   b) engineering chemistry and engineering physics, at least 16 credits must be in required engineering courses and 16 credits in chemistry courses or 16 credits in physics courses required for the major.
   c) computer and information science, at least 20 credits must be in computer and information science courses required for the major.
3. Have taken at Oakland University the last 8 credits needed to complete baccalaureate requirements.
4. Have demonstrated writing proficiency by meeting the university standard in English composition.
5. Have completed the general education requirement of the elected major program.
6. Have completed at least 8 credits of free electives.
7. Have been admitted to major standing in the elected major program.
8. Have completed all requirements specified for the elected major program.
9. Have a cumulative grade point average of courses taken at Oakland University of at least 2.00.
10. Have completed an application for degree card at the Office of the Registrar, and have paid the graduation service fee.
11. Be in substantial compliance with all legal curricular requirements.

Graduation Check

Students are encouraged to participate in a graduation check in the office of the dean during the semester preceding the one of anticipated graduation.

Double Major

To be certified for two majors in engineering, the student 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 refer to the requirements on page 25.

General Education

All Oakland University students must take a series of courses distributed for broad exposure to a liberal education. To satisfy the general education requirements students in the School of Engineering and Computer Science must complete course work distributed as follows:

All programs other than engineering chemistry and physics:

1. Complete 24 credits in general education courses. Up to 8 credits in English composition courses may be part of the 24 general credits, but they do not apply to any designated field group.
2. Complete at least 4 credits in each of two of the five designated field groups, and at least 8 credits in a third field group. The field groups are arts; history, philosophy, and area studies; language and thought; literature; social sciences. Majors in engineering or computer and information science may use these additional courses within field groups: arts—AH 363, DAN 173; social science —ECN 201, 301, 302, and ORG 330; language and thought—PHL 370. Engineering students may also use ECN 150, 200, or 201 to satisfy the economic requirement of their elected major.

For engineering chemistry and engineering physics:

1. Complete at least 24 credits of general education with 4 credits each in arts, literature, and social sciences; 8 credits in language and thought; and 4 credits in history, philosophy, and area studies.

For a description of the field groups students are referred to the College of Arts and Sciences section of this catalog.

The general education requirement may also be met by completing the general education program of the Honors College of Arts and Sciences.

Engineering Schedule

Engineering curricula, particularly in the first two years, are highly structured. The program, given below for the first year, is not a required course sequence, but a recommended schedule for students who have the necessary prerequisites.

Semester 1	**Semester 2**
English composition or distribution requirement	English composition or distribution requirement
EGR 101	ECE 171
MTH 154	MTH 155
CHM 144 or 164	PHY 151

Scheduling for the remaining years depends on the student's selected major but should be tailored to meet major standing requirements promptly. Students should refer to the student handbook for the School of Engineering and Computer Science for suggested schedules.

Students not prepared to enter MTH 154, CHM 144 and PHY 151 without additional preparation in the subject area will have to modify their schedules accordingly. Such students may require additional time to complete degree requirements unless they attend during the spring/summer session following the freshman year to make up deficiencies.

Admission to Major Standing

To be eligible to enroll in 300- and 400-level courses and to be a baccalaureate candidate, a student in the School of Engineering and Computer Science must be admitted to major standing in his/her elected major. The general regulations pertaining to admission to major standing are:

Students Required to Apply: All students following programs in computer engineering, electrical engineering, mechanical engineering, systems engineering, engineering chemistry, engineering physics, and computer and information science are required to apply for major standing.

Timing of Application: The application for major standing must be submitted during the semester in which students will complete all requirements for admission. Students without major standing status will not be permitted to enroll in 300- and 400-level engineering, computer and information science, chemistry and physics courses of their elected program.

Conditional Status: Conditional major standing may be granted to students who are on track towards meeting major standing requirements and are performing at a satisfactory level, but who may be a course short of satisfying all requirements. The top priority of students granted conditional major standing shall be to remove outstanding deficiencies.

Enrollment Limitations: If enrollment limitations are in effect, it is likely that not all students meeting minimum criteria will be admitted to major standing. Admission will be granted to the students with the best academic qualifications.

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

Mathematics: Computer and electrical engineering—MTH 154, 155, 256 and APM 257. Mechanical and systems engineering—MTH 154, 155 and either MTH 254 (or APM 263) or MTH 256 and APM 257. Engineering chemistry and engineering physics—MTH 154, 155, 254. Computer and information science—MTH 154, 155, 256 and APM 263.

Science: Computer, electrical, mechanical, and systems engineering—CHM 144, PHY 151, 152. Engineering chemistry—CHM 144, 145, 149, 342, PHY 151, 152. Engineering physics—CHM 144, 145, PHY 151, 152, 158. Computer and information science—one of the sequences CHM 144-145, CHM 164-165, PHY 151-152, BIO 190-200.

Major: Computer, electrical, mechanical and systems engineering—EGR 101, ECE 171, ME 221, CIS 131. Engineering chemistry—EGR 101, ECE 171, ME 221. Engineering physics—EGR 101, ECE 171, ECE 222. Computer and information science—CIS 130, 131, 280.

To satisfactorily complete the mathematics, science and major requirements for major standing a student must: a) have an average grade of at least 2.00 in each of the three groupings; b) have not more than two numerical grades below 2.00; and c) have not repeated a particular course more than two times, and not repeated more than three different courses. The only courses exempt are those in which a W grade is earned.

Transfer students who satisfy the requirements for major standing using transfer credits are given a conditional major standing status if the requirements

are met with less than five courses which were taken at Oakland University. This excludes courses which are used for satisfying the writing proficiency. The conditional status will be removed when the student successfully completes at least five Oakland University courses which are required for major standing and/or for the major. However, a student must obtain a grade of 2.0 or higher for each of the courses taken to remove conditional status but not specifically required for major standing.

Approved Science Courses

Courses approved as science electives for majors in computer, electrical, general, mechanical and systems engineering are: biology courses numbered 190 and higher; CHM 145, 165, and chemistry courses numbered 225 and higher except CHM 270 and 497; ENV 308, 372, 373; and physics courses numbered 317 and higher, except PHY 341. Special topics and independent study courses require prior approval.

Professional Electives

An engineering student may fulfill a 4-credit professional elective requirement with EGR 490 Senior Engineering Project or EGR 494 Independent Study if the course is approved and directed by a member of the faculty of the student's elected major program, or if the course has been approved in advance by petition.

Free Electives

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 mathematics, physics, and chemistry which are more elementary than MTH 154, PHY 151, and CHM 144, may not be presented for credit toward a degree in engineering.* Specifically, the following courses, and equivalents, are not recognized for credit: MTH 100 to 105, MTH 121 to 123; PHY 101, 102 and 140; and CHM 104, 110 and 140.

New courses in mathematics, physics, or chemistry that may be introduced in the future will be added to the above list, if the content so warrants. A current list of disallowed courses is maintained in the Office of the Dean of Engineering and Computer Science and is available for inspection.

COMPUTER ENGINEERING

Chairperson: *Richard E. Haskell*

Major technological advances are being made in the computer field at a rapid pace and it is essential that computer engineering graduates are not only aware of these advances but are 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 the student with the basic knowledge and skills needed to function effectively in computer related activities in the 1980s. A balance between theoretical and practical experience and an emphasis on both software and hardware aspects of computers are key elements in the computer engineering major at Oakland University.

Program requirements for the baccalaureate in computer engineering are:

		Credits
General Education		24
Mathematics and Science		
MTH 154-155	Calculus	8
MTH 256	Introduction to Linear Algebra	3
APM 257	Introduction to Differential Equations	3
APM 263	Discrete Mathematics	4
CHM 144	General Chemistry	4
PHY 151-152	Introductory Physics	8
Approved science elective		4
		34
Engineering Core		
CIS 131	Introduction to Computer Science II	4
EGR 101	Introduction to Engineering	4
EGR 372	Properties of Materials	4
ECE 171	Introduction to Digital Logic and Microprocessors	4
ECE 222	Introduction to Electrical Circuits	4
ME 221	Statics and Dynamics	4
ME 341	Thermodynamics	4
SYS 317	Engineering Probability and Statistics	3
SYS 325	Lumped Parameter Linear Systems	3
		34
Required Professional Subjects		
ECE 326	Electronic Circuit Design	4
ECE 378	Design of Digital Systems	4
ECE 464	Computer Organization and Architecture	4
ECE 470	Microprocessors and Microcomputers	4
CIS 342	Introduction to Information Structures	4
		20

Professional Electives: 8 credits chosen from

ECE 418	Switching Theory and Digital Logic (4)	
ECE 484	Electronic Devices (4)	
CIS 413	Pattern Recognition (4)	
CIS 417	Applied Numerical Methods: Approximations (4)	
CIS 418	Applied Numerical Methods: Matrix Methods (4)	
CIS 445	Database Systems (4)	
CIS 450	Operating Systems (4)	
CIS 465	Translation of Computer Languages (4)	
SYS 469	Simulation in Engineering (4)	
EGR 490	Senior Engineering Project (2-8)	
EGR 494	Independent Study (2-4)	
ECN 414	Engineering Economics (2)	
		8

Economics Requirement

The economics requirement may be met by completion of ECN 414 as a professional elective or by completion of ECN 150, 200 or 201 as a part of the social science distribution requirement.

Free Electives

For limitation on free electives see page 212.

	8
Total	128

In addition to previously stated requirements, satisfactory completion of the program requires: a) an average grade of at least 2.00 for courses taken to fulfill the mathematics and science requirements, and for courses taken to fulfill the engineering core and professional subjects requirement; and b) that the 300-level engineering core courses and the professional subjects be completed with not more than two grades below 2.0 and not more than a total of three repeat attempts.

ELECTRICAL ENGINEERING

Chairperson: *Richard E. Haskell*

Electrical engineering is a broad field encompassing a number of disciplines. The undergraduate program in electrical engineering at Oakland University is designed to provide the student with the basic knowledge and skills needed to function as an electrical engineer in the 1980s. Students obtain a solid grounding in the fundamentals of analog and digital circuits, electronics, electromagnetics, and electronic devices. In addition the strong laboratory component with numerous design opportunities allows the student to relate theoretical ideas to practical problems. The faculty in electrical engineering are engaged in research related to new developments in the field. These activities contribute to a strong up-to-date undergraduate curriculum.

Program requirements for the baccalaureate in electrical engineering are:

		Credits
General Education		24
Mathematics and Science		
MTH 154-155	Calculus	8
MTH 254	Multivariable Calculus	4
MTH 256	Introduction to Linear Algebra	3
APM 257	Introduction to Differential Equations	3
CHM 144	General Chemistry	4
PHY 151-152	Introductory Physics	8
Approved science elective		4
		34
Engineering Core		
CIS 131	Introduction to Computer Science II	4
EGR 101	Introduction to Engineering	4
EGR 372	Properties of Materials	4
ECE 171	Introduction to Digital Logic and Microprocessors	4
ECE 222	Introduction to Electrical Circuits	4
ME 221	Statics and Dynamics	4
ME 341	Thermodynamics	4
SYS 317	Engineering Probability and Statistics	3
SYS 325	Lumped Parameter Linear Systems	3
		34
Required Professional Subjects		
ECE 326	Electronic Circuit Design	4
ECE 378	Design of Digital Systems	4
ECE 426	Advanced Electronics	4
ECE 445	Electric and Magnetic Fields	4
ECE 484	Electronic Devices	4
ECE 437	Introduction to Communication Electronics (4) or	
SYS 431	Automatic Control Systems (4)	4
		24
Professional Electives: Additional 4 credits chosen from		
ECE 437	Introduction to Communication Electronics (4)	
ECE 470	Microprocessors and Microcomputers (4)	
ECE 487	Integrated Electronics (4)	
CIS 417	Applied Numerical Methods: Approximations (4)	
CIS 418	Applied Numerical Methods: Matrix Methods (4)	
EGR 490	Senior Engineering Project (2-4)	
EGR 494	Independent Study (2-4)	
SYS 431	Automatic Control Systems (4)	
ECN 414	Engineering Economics (2)	
		4

Economics Requirement
The economics requirement may be met by completion of ECN 414 as a professional elective or by completion of ECN 150, 200 or 201 as a part of the social science distribution requirement.

Free Electives
For limitations on free electives see page 212. 8

Total 128

In addition to previously stated requirements, satisfactory completion of the program requires: a) an average grade of at least 2.00 for courses taken to fulfill the mathematics and science requirements, and for courses taken to fulfill the engineering core and professional subjects requirement; and b) that the 300-level engineering core courses and the professional subjects be completed with not more than two grades below 2.0 and not more than a total of three repeat attempts.

MECHANICAL ENGINEERING

Chairperson: *Joseph D. Hovanesian*

The field of mechanical engineering offers a broad spectrum of career opportunities in such areas as design, analysis, test development, research, and the manufacturing of numerous products. The curriculum is based on a solid foundation in mechanics of solids, thermodynamics, fluid mechanics, transfer and rate mechanisms, materials, design of mechanical systems, and electrical theory. A strong laboratory experience is interwoven through the curriculum, and opportunities are provided to allow students to relate theoretical ideas to practical problems. The option of selecting several of the senior-level courses allows for great flexibility in the choice of the optional areas of specialization within mechanical engineering.

Program requirements for the baccalaureate in mechanical engineering are:

		Credits
General Education		24
Mathematics and Science		
MTH 154-155	Calculus	8
MTH 254	Multivariable Calculus	4
MTH 256	Introduction to Linear Algebra	3
APM 257	Introduction to Differential Equations	3
CHM 144	General Chemistry	4
PHY 151-152	Introductory Physics	8
Approved science elective		4
		34
Engineering Core		
CIS 131	Introduction to Computer Science II	4
EGR 101	Introduction to Engineering	4
EGR 372	Properties of Materials	4
ECE 171	Introduction to Digital Logic and Microprocessors	4
ECE 222	Introduction to Electrical Circuits	4
ME 221	Statics and Dynamics	4
ME 341	Thermodynamics	4
SYS 317	Engineering Probability and Statistics	3
SYS 325	Lumped Parameter Linear Systems	3
		34
Required Professional Subjects		
ME 331	Introduction to Fluid and Thermal Energy Transport	4
ME 361	Mechanics of Materials	4
One course chosen from Group A *and* one from Group B:		

Group A		
ME 461	Analysis and Design of Mechanical Structures (4)	
ME 486	Machine Design (4)	4
Group B		
EGR 490	Senior Engineering Project (4)	
ME 454	Solar and Alternate Energy Systems (4)	
ME 482	Fluid and Thermal Energy Systems (4)	4
		16

Professional Electives (Chosen from Group A or Group B or from the following)

ME 421	Dynamics (4)	
ME 438	Fluid Transport (4)	
ME 448	Thermal Energy Transport (4)	
ME 455	Combustion Processes (4)	
ME 456	Energy Systems Analysis (4)	
ME 472	Mechanical Properties of Materials (4)	
ECN 414	Engineering Economics (2)	
Not more than 4 credits from:		
EGR 407	Environmental Engineering (4)	
EGR 490	Senior Engineering Project (2 to 4)	
EGR 494	Independent Study (2 to 4)	
SYS 431	Automatic Control Systems (4)	
SYS 469	Simulation in Engineering (4)	
SYS 483	Production Systems (4)	
CIS 417	Applied Numerical Methods: Approximations (4)	
CIS 418	Applied Numerical Methods: Matrix Methods (4)	12

Economics Requirement

The economics requirement may be met by completion of ECN 414 as a professional elective or by completion of ECN 100, 150, 200 or 201 as a part of the social science distribution requirement.

Free Electives

For limitations on free electives see page 212. 8

Total 128

In addition to previously stated requirements, satisfactory completion of the program requires: a) an average grade of at least 2.00 for courses taken to fulfill the mathematics and science requirements, and for courses taken to fulfill the engineering core and professional subjects requirement; and b) that the 300-level engineering core courses and the professional subjects be completed with not more than two grades below 2.0 and not more than a total of three repeat attempts.

SYSTEMS ENGINEERING

Chairperson: *Donald R. Falkenburg*

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

The systems engineering program at Oakland University contains two options: (1) Dynamic Systems and Control, (2) Computer-Aided Systems Design. The first option prepares the student for the field of control engineering. The curriculum combines courses from electrical and mechanical engineering along with the systems engineering control sequence. It has been designed to teach the fundamentals of mechanical systems, control system design techniques, as well as the practical matter of implementing the controllers in modern electronic hardware.

The second stem emphasizes the important role of the computer in systems design. This curriculum is anchored in a strong computer science component, which

along with professional courses prepares a student for a career in simulation, computer-aided design and systems of optimization.

		Credits
General Education		24
Mathematics and Science		
MTH 154-155	Calculus	8
MTH 256	Introduction to Linear Algebra	3
APM 257	Introduction to Differential Equations	3
*APM 263	Discrete Mathematics (4) or	
*MTH 254	Multivariable Calculus (4)	4
CHM 144	General Chemistry	4
PHY 151-152	Introduction to Physics	8
Approved science elective		4
		34

*MTH 254 required for Dynamic Systems and Control option and APM 263 required for Computer-Assisted Systems Design option

Engineering Core		
CIS 131	Introduction to Computer Science II	4
EGR 101	Introduction to Engineering	4
EGR 372	Properties of Materials	4
ECE 171	Introduction to Digital and Microprocessors	4
ECE 222	Introduction to Electrical Circuits	4
ME 221	Statics and Dynamics	4
ME 341	Thermodynamics	4
SYS 317	Engineering Probability and Statistics	3
SYS 325	Lumped Parameter Linear Systems	3
		34

Professional Subjects for Dynamics Systems and Control Option (28 credits)

Required Professional Subjects		
ECE 326	Electronic Circuit Design	4
ECE 378	Design of Digital Systems	4
ME 421	Dynamics	4
SYS 431	Automatic Control Systems	4
SYS 433	Modern Control System Design	4
		20

Professional Electives: 8 credits chosen from

SYS 410	Systems Optimization and Design (4)
SYS 422	Intelligent Robotics (4)
SYS 458	Electrical Energy Systems (4)
SYS 463	Foundations of Computer-Aided Design (4)
SYS 469	Simulation in Engineering (4)
SYS 483	Production Systems (4)
SYS 485	Statistical Quality Control (4)
EGR 407	Environmental Engineering (4)
EGR 490	Senior Engineering Project (2-8)
EGR 494	Independent Study (2-4)
ECE 426	Advanced Electronics (4)
ECE 437	Introduction to Communication Electronics (4)
ECE 470	Microprocessors and Microcomputers (4)
ECE 471	Microprocessor Systems Applications (4)
ME 331	Introduction to Fluid and Thermal Energy Transport (4)
ME 361	Mechanics of Materials (4)
ME 454	Solar and Alternate Energy Systems (4)
ME 482	Fluid and Thermal Energy Systems (4)
CIS 413	Pattern Recognition (4)
CIS 417	Applied Numerical Methods: Approximations (4)
CIS 418	Applied Numerical Methods: Matrix Methods (4)

ECN 414	Engineering Economics (2)	
		8

Professional Subjects for Computer-Assisted Systems Design Option (28 credits)

Required Professional Subjects

CIS 342	Introduction to Information Structures	4
CIS 418	Applied Numerical Methods: Matrix Methods	4
SYS 410	Systems Optimization and Design	4
SYS 463	Foundations of Computer-Aided Design	4
SYS 469	Simulation in Engineering	4
		20

Professional Electives: 8 credits chosen from

SYS 422	Intelligent Robotics (4)	
SYS 458	Electrical Energy Systems (4)	
SYS 483	Production Systems (4)	
SYS 485	Statistical Quality Control (4)	
EGR 407	Environmental Engineering (4)	
EGR 490	Senior Engineering Project (2-8)	
EGR 494	Independent Study (2-4)	
CIS 413	Pattern Recognition (4)	
CIS 416	Artificial Intelligence (4)	
CIS 417	Applied Numerical Methods: Approximations (4)	
CIS 439	Software Engineering (4)	
CIS 445	Database Systems (4)	
CIS 450	Operating Systems (4)	
CIS 465	Translation of Computer Languages (4)	
CIS 470	Microprocessors and Microcomputers (4)	
CIS 471	Microprocessor Systems Applications (4)	
CIS 495	Special Topics (2-4)	
ECN 414	Engineering Economics (2)	
		8

Economics Requirement

The economics requirement may be met by completion of ECN 414 as a professional elective or by completion of ECN 100, 150, 200 or 201 as a part of the social science distribution requirement.

Free electives

For limitations on free electives see page 212. 8

Total 128

In addition to previously stated requirements, satisfactory completion of the program requires: a) an average grade of at least 2.00 for courses taken to fulfill the mathematics and science requirements, and for courses taken to fulfill the engineering core and professional subjects requirement; and b) that the 300-level engineering core courses and the professional subjects be completed with not more than two grades below 2.0 and not more than a total of three repeat attempts.

ENGINEERING CHEMISTRY

Program Advisers: *Joel Russell, Howard R. Witt*

The program in engineering chemistry, which is a joint offering of the School of Engineering and Computer Science and the College of Arts and Sciences, leads to the Bachelor of Science degree. It provides for in-depth study in chemistry along with basic preparation in engineering.

Program requirements for the Bachelor of Science degree in engineering chemistry are:

		Credits
General Education		24
Mathematics, Physics and Computer Science		
MTH 154-155	Calculus	8
MTH 254	Multivariable Calculus	4
APM 257	Introduction to Differential Equations	3
PHY 151-152	Introduction to Physics	8
CIS 327	Computer Techniques in Chemistry	2
		25
Chemistry		
CHM 144-145	General Chemistry	8
CHM 149	Chemistry Laboratory	2
CHM 234-235	Organic Chemistry	8
CHM 237	Separations and Spectroscopy Laboratory	2
CHM 342-343-344	Physical Chemistry	9
CHM 348	Physical Chemistry Laboratory	2
CHM 471	Macromolecular Chemistry	3
plus 6 credits from		
CHM 462-463	Inorganic Chemistry (4)	
CHM 472	Macromolecular Chemistry II (3)	
CHM 477	Molecular Laboratory (2)	
CHM 570	Industrial Chemistry (3)	6
		40
Engineering		
EGR 101	Introduction to Engineering	4
ECE 171	Introduction to Digital Logic and Microprocessors	4
ECE 222	Introduction to Electrical Circuits	4
ME 221	Statics and Dynamics	4
ME 331	Introduction to Fluid and Thermal Energy Transport	4
SYS 325	Lumped Parameter Linear Systems	3
plus 8 credits from		
ME 438	Fluid Transport (4)	
ME 448	Thermal Energy Transport (4)	
ME 455	Combustion Processes (4)	
ME 482	Fluid and Thermal Energy Systems (4)	
SYS 431	Automatic Control Systems (4)	8
		31
Free Electives		
For limitations on free electives see page 212.		8
	Total	128

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 and chemistry requirements and in the courses prescribed for the mathematics, physics, and computer science requirement.

ENGINEERING PHYSICS

Chairperson: *Howard R. Witt*

The program in engineering physics, which is a joint offering of the School of Engineering and Computer Science and the College of Arts and Sciences, leads to the Bachelor of Science degree. It is intended for well qualified students who seek a broad education in physics and mathematics along with basic preparation in engineering.

Program requirements for the Bachelor of Science degree in engineering physics are:

		Credits
General Education		24
Mathematics and Science		
MTH 154-155	Calculus	8
MTH 254	Multivariable Calculus	4
APM 257	Introduction to Differential Equations	3
CHM 144-145 or (CHM 164-165)	General Chemistry	8
PHY 151-152	Introductory Physics	8
PHY 158 or 159	Physics Laboratory	2
PHY 317	Modern Physics Laboratory	2
*PHY 341 or (ECE 326)	Electronics	(4)
PHY 351	Intermediate Theoretical Physics	4
PHY 361	Mechanics I	4
PHY 371	Modern Physics	4
One of:		
PHY 331	Optics	
PHY 381	Electricity and Magnetism I	
PHY 472	Quantum Mechanics I	4
		51-55

*Students taking PHY 341 and planning to take advanced ECE courses should also take PHY 347. For these students PHY 347 may be counted as part of the technical elective requirement.

Engineering		
EGR 101	Introduction to Engineering	4
ECE 171	Introduction to Digital Logic and Microprocessors	4
ECE 222	Introduction to Electrical Circuits	4
ECE 326 or (PHY 341)	Electronic Circuit Design	(4)
ME 341	Thermodynamics	4
SYS 317	Engineering Probability and Statistics	3
SYS 325	Lumped Parameter Linear Systems	3
Plus three 4-credit, 400-level engineering electives of the same designation, at least two of which must be chosen from the list of approved design electives.		12
		34-38

Technical Electives (Additional 7 to 8 credits chosen from the following)

MTH 256	Introduction to Linear Algebra (3)
APM 263	Discrete Mathematics (4)
PHY 318	Nuclear Physics Laboratory (2)
PHY 331	Optics (4)
PHY 372	Nuclear Physics (4)
PHY 381	Electricity and Magnetism I (4)
PHY 418	Modern Optics Laboratory (2)
PHY 472	Quantum Mechanics I (4)
CIS 131	Introduction to Computer Science II (4)
ME 331	Introduction to Fluid and Thermal Energy Transport (4)
ME 361	Mechanics of Materials (4)
Any EGR, ECE, ME, or SYS 400-level courses	7-8

Free Electives

For limitations on free electives see page 212. 8

Total 128

In addition to the previously stated requirements satisfactory completion of the program requires an average grade of at least 2.00 in the mathematics and science courses and also in the engineering and computer science courses taken to meet program requirements.

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

ECE 426	Advanced Electronics (4)
ECE 437	Introduction to Communication Electronics (4)
ECE 470	Microprocessors and Microcomputers (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)
SYS 410	Systems Optimization and Design (4)
SYS 483	Production Systems (4)

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

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

COMPUTER AND INFORMATION SCIENCE

Chairperson: *Glenn A. Jackson*

The program in computer and information science leads to the degree of Bachelor of Science. It prepares the student for professional practice in systems programming, software design, and computer applications or for graduate study in computer science by providing a solid foundation based on the organization, processing and display of information. Through choice of a minor, a student can broaden his/her area of expertise to include such diverse subjects as: computer engineering, business applications, management science, or any other area that utilizes the computer in everyday operations.

Program requirements for the Bachelor of Science degree in computer and information science are:

		Credits
General Education		24
Mathematics		
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
		19
Science (One of the following sequences)		
CHM 144-145	General Chemistry	
CHM 164-165	General Chemistry	
PHY 151-152	Introductory Physics	
BIO 190-200	Biology	
		8
Computer and Information Science Core		
CIS 130-131	Introduction to Computer Science	8
CIS 280	Introduction to Computer Organization and Assembly Programming	4
CIS 335	Programming Languages	4
CIS 342	Introduction to Information Structures	4
CIS 450	Operating Systems	4
		24

Computer and Information Science Electives 20 credits chosen from the list of courses approved as computer and information science electives. At least 8 credits must be at the 400-level and an additional 4 credits at the 300-level or above.	20
Approved Minor	20
Free Electives	9
Total	124

Satisfactory completion of the program requires: a) an average grade of at least 2.00 for the required courses in mathematics, and for the computer and information science and elective courses, and for the approved minor; and b) that not more than two grades below 2.0 be presented, and not more than three repeat attempts be used, in completing the computer and information science elective requirement beyond CIS 130, 131 and 280.

Approved Computer and Information Science Electives.

Courses approved as electives for the computer and information science program include: CIS 220, 248, 340, 358; all 400-level CIS courses but not more than 4 credits of CIS 490; ECE 378, 418, 464, 470, 471; SYS 469, 483. Not more than 4 credits of course work may be simultaneously counted toward the CIS major and the computer engineering minor requirements.

Approved Minor

Computer and information science students must complete an approved minor with an average grade of at least 2.00. Approved minors are in:

Computer Engineering	Chemistry	Economics
Applied Mathematics	Linguistics	Finance
Applied Statistics	Physics	Management
Biology	Accounting	Quantitative Methods

Other minors or alternate programs may be approved by petition. Each student must apply to the coordinator of the program for assistance in planning the minor and to obtain certification. Courses used to satisfy courses for a minor may also be used to meet other program requirements, except that CIS courses may not be used towards both major and minor requirements. Also students may not receive credit for both CIS 470 and ECE 470 and for both CIS 471 and ECE 471.

Although it is not a requirement, it is recommended that computer and information science majors complete PHL 370 Symbolic Logic.

CONCENTRATIONS AND MINORS

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

Described below are the requirements for the minors and concentrations that have been approved for engineering and/or computer and information science students. Students planning a medical, dental, or optometry career are advised to take the concentration in preprofessional studies in medicine, dentistry, and optometry.

Computer Engineering: (R.E. Haskell, Coordinator) For computer and information science majors. To obtain the minor in computer engineering a student must complete the following courses (20 credits) with an average grade of at least 2.00: ECE 171, 222, 326, 378, and one course from ECE 418, 426, 437, 464, 470, 471, 484, 487, and EGR 490.

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

Applied Statistics: (Harvey Arnold, Coordinator) For engineering and computer and information science majors. To obtain a concentration in applied statistics the student must complete at least 16 credits in statistics with an average grade of at least 2.00 including STA 226 (or other approved introductory course), STA 322, STA 323 and STA 324. Students should consult an adviser in the Department of Mathematical Sciences in planning their programs.

Biology: (Nalin J. Unakar, Coordinator) For computer and information science students. To obtain a liberal arts minor in biology the student must take a minimum of 20 credits in biology, including BIO 190, 195 and 200, and at least 8 credits in courses numbered 300 or higher.

Chemistry: (Paul Tomboulian, Coordinator) For computer and information science students. To obtain a liberal arts minor in chemistry (26 credits) the student must take CHM 144-145, 149, 225, 203-204 or 234-235, and 342. For engineering students to obtain the minor in chemistry an engineering student must complete the following courses (24 credits) with an average grade of 2.00 or better: CHM 144, 145, 149, 203, 342, 471, 570.

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

Linguistics: (William Schwab, Coordinator) For computer and information science students. To obtain the liberal arts minor in linguistics the student must complete the following courses (20 credits) with an average grade of at least 2.00: a) ALS 176 or one 200-level LIN course; b) LIN 301; c) at least 12 credits at the 300 or 400 levels; and d) at least 4 credits at the 400 level.

Physics: (Abraham Liboff, Coordinator) For computer and information science students. To obtain the liberal arts minor in physics a student must complete 20 credits including the following courses with an average grade of at least 2.00: PHY 151-152, 158 or 159, and at least 8 credits in physics numbered 300 or higher.

Accounting: (David D. Sidaway, Coordinator) For computer and information science students. To obtain the minor in accounting the student must complete the following courses (20 credits) with an average grade of at least 2.00: ACC 200, 210, and 12 additional credits in accounting (ACC) courses for which the student has the prerequisites.

Economics: (David P. Doane, Coordinator) For engineering and computer and information science students. To obtain the minor in economics offered by the School of Economics and Management engineering and computer and information science majors must complete the following courses (18-20 credits) with an average grade of at least 2.00: a) ECN 150 or ECN 210 or ECN 200-201; and b) 12 additional credits in economics (ECN) courses for which the student has the prerequisites (16 additional credits if the student took ECN 150).

Finance: (Karl D. Gregory, Coordinator) For computer and information science students. To obtain the minor in finance the student must complete the following courses (22 credits) and any prerequisites required: ACC 200, QMM 250, FIN 322, and 8 additional credits of finance (FIN) courses. An average grade of at least 2.00 is required.

Management: (Leonard C. Schwartz, Coordinator) For engineering and computer science students. To obtain the minor in management a student must complete the following courses (22-24 credits) with an average grade of at least 2.00: ECN 210 or ECN 200-201, ACC 200, ORG 330, and 8 additional 300- or 400-level electives (ACC, FIN, MGT, MIS, MKT, ORG, QMM) for which the student has the prerequisites.

Quantitative Methods: (David P. Doane, Coordinator) For computer and information science students. To obtain the minor in quantitative methods (19-22 credits) the student must complete the following courses with an average grade of at least 2.00: a) QMM 250, STA 226 or SYS 317; b) 8 additional credits of QMM courses; and c) 8 additional credits of QMM, MOR, MIS, or STA courses.

REQUIREMENTS FOR ADMISSION TO COOPERATIVE EDUCATION PROGRAM

Students interested in the cooperative education program in engineering or computer and information science should apply through the Office of the Cooperative Education Coordinator, Room 159 Dodge Hall. To be admitted a student must:

1. be admitted to major standing in an engineering major or in computer and information science. In addition engineering students must have completed the mathematics sequence appropriate to their elected major.
2. have a cumulative grade point average of at least 2.80.
3. have the approval of the School of Engineering and Computer Science, the cooperative education coordinator for the school, and the employer.

Transfer students must have completed at least one semester of full-time study at Oakland University before acceptance into the program, including at least 8 credits of course work in the major.

Conditions for Cooperative Education Students

To remain in good standing in the cooperative education program the student must:

1. complete alternate semesters of full-time study and full-time work experience.
2. complete at least 12 credits of work appropriate to his/her elected major during each semester of study and maintain a cumulative grade point average of at least 2.80.
3. complete EGR 391 Cooperative Engineering or CIS 391 Cooperative Computer and Information Science during the semester following each training assignment.
4. submit a satisfactory training report within four weeks of the beginning of the semester following each training assignment as a part of the requirements for EGR 391 or CIS 391.
5. receive a satisfactory employer evaluation for each training assignment.

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

Students not meeting the conditions for good standing will be liable for dismissal from the cooperative education program.

MINOR IN COMPUTER AND INFORMATION SCIENCE FOR NONENGINEERING MAJORS

Coordinator: *Glenn A. Jackson*

The School of Engineering offers a minor in computer and information science to students in nonengineering majors. Many combinations are feasible.

Requirements for majors in the College of Arts and Sciences are 20 credits in CIS courses, including: a) CIS 122 or 123 or 130; b) two courses from CIS 131, 220, 221, 280; and c) 8 credits from CIS courses labled 300 or higher (only 4 credits of CIS 490 may be applied toward this requirement). Students seeking a minor will need to obtain permission from the office of the dean, School of Engineering and Computer Science for clearance to register for 300- and 400-level courses in CIS.

COURSE OFFERINGS IN THE SCHOOL OF ENGINEERING

The course offerings in engineering are listed under the following designations: EGR—Engineering; ECE—Electrical and Computer Engineering; ME—Mechanical Engineering; SYS—Systems Engineering. The computer and information courses carry the CIS designation. To register for 300- and 400-level courses in the School of Engineering and Computer Science students must have been admitted to major standing.

COURSE OFFERINGS IN ENGINEERING

EGR 101 Introduction to Engineering (Core) (4)
An introduction to the principles of engineering: communications, professional practice, design, analysis and computation. Laboratory work includes the use of microcomputers applied to design problems in computer, electrical, mechanical and systems engineering. Corequisite: MTH 154.

EGR 106 Machine Shop Practice (2)
Introduction to basic machining principles and machine shop techniques, uses of the lathes, milling machines, and other power machines. Emphasis is on practical experience.

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

EGR 290 Engineering Project (2 to 4)
Introductory laboratory project. Topic must be approved prior to registration. May be taken more than once. Offered every semester.

EGR 294 Independent Study (2 to 4)
Introductory laboratory project. Topic must be approved prior to registration. May be taken more than once. Offered every semester.

EGR 295 Special Topics (2 to 4)
Introductory and intermediate level of study of special topics in engineering. May be taken more than once.

EGR 360 History of Automobile Design (4)
Identical with AH 360.

EGR 363 Modern Architecture and Urban Design (4)
Identical with AH 363.

EGR 372 Properties of Materials (Core) (4)
The atomic, molecular, and crystalline structure of solids, including a description of x-ray analysis, metallography, and other methods for determining structure; correlation of structure with the electric, magnetic, and mechanical properties of solids. With laboratory. Prerequisite: CHM 144, PHY 152, major standing.

EGR 391 Cooperative Engineering (1)
A seminar course for cooperative engineering students to be taken in the semester following

each training assignment. A report of the training assignments must be submitted within four weeks of the beginning of the course. May be repeated up to 3 times.
Prerequisite: Consent of the Cooperative Education Coordinator.

EGR 400 Engineering Seminar (1)
Lectures and discussions conducted by faculty, graduate students, and speakers from industry and other universities. Emphasis is on current research interests of the school. May be taken twice.

EGR 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 guest speakers. A group or individual project is required.
Prerequisite: ME 341.

EGR 490 Senior Engineering Project (2 to 8)
Independent work on advanced laboratory projects. Topic must be approved prior to registration. May be taken more than once.

EGR 494 Independent Study (2 to 4)
Advanced individual study in a special area. Topic must be approved prior to registration. May be taken more than once.

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

COURSE OFFERINGS IN ELECTRICAL AND COMPUTER ENGINEERING

For additional related courses students should refer to the course offerings in Systems Engineering (SYS) and Computer and Information Science (CIS).

ECE 171 Introduction to Digital Logic and Microprocessors (Core) (4)
Introduction to digital logic and microprocessors. Machine language programming of microprocessors. Use of microcomputers for laboratory data acquisition and analysis.
Prerequisite: EGR 101 or CIS 130, and MTH 154.

ECE 222 Introduction to Electrical Circuits (Core) (4)
Logic circuits, introduction to logic gates, and Boolean algebra; resistive DC circuits, Kirchhoff laws, Thevenin and Norton theorems, transients in RL and RC circuits, and reactance. With laboratory.
Prerequisite: MTH 155 and ECE 171.

ECE 326 Electronic Circuit Design (4)
Analysis and design of solid-state electronic circuits. Piecewise linear, graphical, and small signal analysis of diode circuits; applications. Bipolar and field effect transistor circuit analysis: v-i characteristics, graphical analysis, load lines, biasing, amplification, hybrid parameters, and small signal analysis; blocking and coupling capacitors. Loaded two-ports and properties of CE, CB, and CC stages. Multistage amplifier design. Introduction to operational amplifier circuits and applications. With laboratory.
Prerequisite: ECE 222, MTH 155, PHY 152 and major standing.

ECE 378 Design of Digital Systems (4)
Development of the components and techniques at the gate and flipflop level needed to design digital systems for instrumentation, communication, control, and related fields. Topics include combinational logic circuits, memory devices, sequential circuits, and organization of digital systems.
Prerequisite: ECE 326.

ECE 418 Switching Theory and Sequential Machines (4)
Combinational switching functions, minimization and analysis, implementation using relay circuits, TTL, CMOS and other popular logic families. Symmetric functions, threshold logic, and interative circuits. Analysis and synthesis of clock mode, level mode and pulse mode sequential circuits. Design and implementation of digital systems. Turing machines and finite automata.
Prerequisites: ECE 378, APM 263.

ECE 426 Advanced Electronics (4)
Advanced operational amplifier circuits. Performance characteristics, offset compensation, bandwidth limitations. Inverters, buffers, differential amplifiers; lowpass, highpass, bandpass, and notch filters; sensitivity analysis. Audio power amplifiers: feedback, distortion reduction, bandwidth. Bipolar and field effect transistors at high frequencies: gain-bandwidth calculations from the hybrid-pi equivalent circuit. Tuned circuits and resonant loaded amplifiers. With laboratory.
Prerequisites: ECE 326, SYS 325.

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

ECE 445 Electric and Magnetic Fields (4)
Fundamentals of electric and magnetic fields. Fundamental laws, basic postulates, Maxwell's equations, electrostatics, magnetic fields of steady currents, time varying fields, waves, transmission lines, reflection and refraction of interfaces, guided waves, radiation, and elementary radiators. Use of computers to solve practical problems.
Prerequisite: SYS 325, MTH 254.

ECE 464 Computer Organization and Architecture (4)
Stored program computers, organization of arithmetic-logic unit, central processing unit, main and auxiliary memory, input/output units and exercises in microprogramming. Central and distributed processing computer networks, architecture of some main frame computers and some microprocessors, parallel and pipeline processing.
Prerequisites: CIS 280, ECE 378.

ECE 470 Microprocessors and Microcomputers (4)
Introduction to microprocessors and microcomputers; the CPU on a chip; interfacing microprocessors with external systems; programming considerations; logic design with microcomputers; hands-on laboratory experience. Credit may not be earned for both ECE 470 and CIS 470.
Prerequisite: ECE 378 or 418.

ECE 471 Microprocessor Systems Applications (4)
The design of microprocessor-based equipment and systems. Interfacing techniques; serial asynchronous and synchronous communications methods; direct memory access, A/D and D/A converters, peripheral interface devices, computer graphics. Project-oriented course. Credit may not be earned for both ECE 471 and CIS 471.
Prerequisite: ECE 470.

ECE 484 Electronic Devices (4)
Basic concepts of quantum mechanics as applied to electronic devices. Semiconductor physics, including carrier densities, diffusion and conduction mechanisms. Theory of P-N junction and junction devices. Also included are FET, CCD, and MOS devices. Fabrication and fundamentals of integrated circuits.
Prerequisites: EGR 372 and ECE 326.

ECE 487 Integrated Electronics (4)
Crystal growth—bulk and epitaxial techniques. Fabrication of P-N junctions. Ion implantation. Integrated circuits technology; semiconductor materials; tunnel diodes, photodiodes; light-emitting diodes; semiconductor lasers; switching devices.
Prerequisite: ECE 484.

COURSE OFFERINGS IN MECHANICAL ENGINEERING

ME 221 Statics and Dynamics (Core) (4)
Introduction to mechanics, particle statics and dynamics, equilibrium, analysis of structures, and dynamics of rigid bodies about fixed axes. With laboratory.
Prerequisites: MTH 155 and CIS 130. Corequisite: PHY 151.

ME 331 Introduction to Fluid and Thermal Energy Transport (4)
Fundamentals of fluid mechanics; conservation principles; viscous and inviscid flow; laminar and turbulent flow; boundary layer theory; heat transfer; fundamental modes; conduction, convection, and thermal radiation, and applications to problems of engineering interest. With laboratory.
Prerequisite: ME 341 and major standing.

ME 341 Thermodynamics (Core) (4)
Introduction to thermal energy, thermodynamic properties and equilibrium, basic physical laws of thermodynamics, entropy and its consequences, reversible energy transfers in both open and closed systems, and application of thermodynamics to systems involving energy conversion and transport. With laboratory.
Prerequisites: CHM 144 or 164 and major standing. Corequisite: MTH 254 or APM 263.

ME 361 Mechanics of Materials (4)
Introduction to the mechanics of deformable bodies: distribution of stress and strain in beams, shafts, columns, pressure vessels, and other structural elements. Yield and fracture criteria of materials with applications to design. With laboratory.
Prerequisites: EGR 372, ME 221, and major standing.

ME 421 Dynamics (4)
Kinematics and dynamics of systems of particles. General theory of rotating coordinate frames, work-energy principle, relative motion, Lagrange's equations. Introduction to rigid body motion.
Prerequisite: ME 221 and SYS 325.

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.
Prerequisites: ME 331, 341, and APM 257.

ME 448 Thermal Energy Transport (4)
Continued study of basic concepts, properties, and descriptions of three modes of heat transfer (conduction, convection, and thermal radiation), theoretical, numerical, and analogical methods of steady, transient, and single- and multi-dimensional problems. Includes laboratory.
Prerequisites: ME 331, 341 and APM 257.

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.
Prerequisites: ME 331 and ME 341.

ME 455 Combustion Processes (4)
Thermodynamics of state, mixtures, Gibbs free energy; chemical equilibrium, stoichiometry; chemical reaction kinetics, reaction rate, mixing, catalyst action; fluid vaporization, condensation, atomization; applications, spark and compression ignition, continuous combustion.
Prerequisite: ME 341.

ME 456 Energy Systems Analysis (4)
Thermodynamics of non-reacting mixtures, psychrometry. Concepts of availability and irreversibility. Power cycles; vapor, gas and combined cycles. Reciprocating engines and compressors. Refrigeration and heat pump cycles; vapor compression system, air-conditioning. Thermodynamics of reacting mixtures; combustion.
Prerequisite: ME 341.

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

ME 472 Mechanical Properties of Materials (4)
Mechanical behavior of materials, with emphasis on defect structures in metals. True stress-

strain properties of real materials. Plastic deformation and fracture of materials. Theories of yield and fracture strength. Cyclic loading behavior including cumulative damage. Creep, temperature, and rate-of-loading effects.
Prerequisite: ME 361.

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, and applications in environmental pollution. Analysis, design, and optimization of systems are emphasized using basic integral, differential, and lumped parameter modeling techniques. The course bridges conventional engineering design disciplines.
Prerequisites: ME 331 and 341 and APM 257.

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

COURSE OFFERINGS IN SYSTEMS ENGINEERING

For related courses students should refer to the course offerings in electrical and computer engineering (ECE).

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

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

SYS 410 System Optimization and Design (4)
Computer techniques for systems optimization and design. Direct and indirect search techniques including gradient methods and the Newton-Raphson algorithm, linear programming. The course emphasizes a capstone design experience involving systems modeling, simulation and optimal design.
Prerequisites: SYS 469, CIS 418.

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

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

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

SYS 458 Electrical Energy Systems (4)
Generation and transmission of electrical energy systems. Analytical methods for solution of

planning/operational problems with computer utilization. Analysis of synchronous machines, transformer excitation, prime mover governing, transmission networks and loads. System dynamic performance under disturbance conditions, line switching, and parameter variations with attention to frequency and voltage control strategies.
Prerequisite: SYS 325.

SYS 463 Foundations of Computer Aided Design (4)
The design of computer graphics software for electrical, mechanical and systems engineering. Raster graphics fundamentals, fill algorithms, transformations, curve generation, user input techniques, and 2-D animation. Application programs using data structures are written in PASCAL.
Prerequisite: CIS 342.

SYS 469 Simulation in Engineering (4)
Basic modeling and simulation methodology for discrete and continuous systems. The selection of input parameters and probability distributions. On-line user interactive graphical displays for output analysis and validation.
Prerequisite: CIS 342.

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

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

COURSE OFFERINGS IN COMPUTER AND INFORMATION SCIENCE

For additional computer courses students should refer to the course offerings in Electrical and Computer Engineering (ECE).

CIS 121 Introduction to Computer Programming (2)
An introduction to the FORTRAN programming language. Topics covered include data storage and manipulation; simple and formatted I/O; control structures; subprogramming. Emphasis is on engineering and scientific applications.
Prerequisite: Ability to program in at least one high level language.

CIS 122 BASIC Programming (4)
An introduction to computer programming and problem solving using the BASIC language on personal computers. Graphics applications are used to develop programming skills. Other application areas include string manipulation and word processing; data processing and file operations; interactive programming techniques. No credit granted after completion of CIS 123 or CIS 130.
Prerequisite: MTH 103 or equivalent.

CIS 123 BASIC Programming (4)
An introduction to computer programming and problem solving using the BASIC language. Elementary applications are used to develop programming skills and may include: file operations; interactive programming techniques. No credit granted after completion of CIS 122 or CIS 130.
Prerequisite: MTH 103 or equivalent.

CIS 130 Introduction to Computer Science I (4)
Introduction to digital computers and digital computation, and algorithmic programming language such as PASCAL. Students lacking a good background in high school mathematics should enroll in CIS 122 or 123. Offered every semester.
Prerequisite: MTH 104 or equivalent.

CIS 131 Introduction to Computer Science II (4)
Introduction to numerical methods; data structures and nonnumerical applications; another important algorithmic language such as PL/1. Offered fall and winter semesters.
Prerequisite: CIS 130 and MTH 154 or MTH 122.

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

CIS 221 Computer-Based Information Systems II (4)
Continuation of CIS 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: CIS 220 or equivalent.

CIS 224 Computer Awareness and Personal Computing (4)
Introduction to computers and their role in education. The impact of personal computers on education at the elementary and secondary school levels. How computers can be used for computer-aided instruction and computer-managed instruction. A look at the future role and social impact of personal computers. Enrollment limited to majors in the School of Human and Educational Services.

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

CIS 280 Introduction to Computer Organization and Assembly Programming (4)
Introduction to the internal structure and operation of a digital computer. Hardware organization, machine language, instruction execution, digital arithmetic, addressing techniques, and digital representations of data. Assembly language, macro- and micro-programming, program segmentation, and linking and loading vs. relocatable modules.
Prerequisites: One of CIS 130, 122 or 123 and MTH 154 or 122.

CIS 294 Independent Study (2 to 4)
Introductory and intermediate level individual study in a special area of computer science. Topic must be approved prior to registration.

CIS 295 Special Topics (2 to 4)
Introductory and intermediate level study of special topics in computer science. May be taken more than once.

CIS 325 Computer Usage in Education (4)
Examination of computer-assisted and computer-managed instruction as they relate to learning in the classroom. The student will gain experience in the programming language BASIC. This skill will be applied to the creation of programs in a hands-on experience with microcomputers. Enrollment is limited to majors in the School of Human and Educational Services.
Prerequisites: ED 215, 224, 345 and CIS 224, or permission of instructor.

CIS 327 Computer Techniques for Chemistry (2)
Computer programming and applications designed to acquaint chemistry students with problem-solving techniques and use of computers in data processing.
Prerequisites: MTH 154 and CHM 225. Corequisite: CHM 441.

CIS 335 Programming Languages (4)
Fundamental concepts in programming languages studied by means of comparative language analysis. Several high-level languages are studied in some depth and their approaches to the fundamental issues in language design are compared. Issues include: data types and structures; control structures; binding times; run-time storage organization; flexibility versus efficiency; compiled versus interpreted languages; strong versus weak typing; block structure and scope of names.
Prerequisites: CIS 131, 280, MTH 256 and major standing.

CIS 340 File Systems Design (4)
Study of hardware configurations and software systems design for data-oriented applications. Characteristics of mass-storage devices and the impact of the characteristics on data processing algorithm design; standard file access techniques; file design for data processing applications.
Prerequisites: CIS 131, 280 and major standing.

CIS 342 Introduction to Information Structures (4)
Elementary data structures and their application in computer programming. Linear lists, arrays trees, forests and generalized lists and their implementation using sequential and linked storage. Recursive and nonrecursive algorithms for representative data structure operations. Searching, sorting, hashing and elementary memory management.
Prerequisites: CIS 131, 280, APM 263 and major standing.

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

CIS 391 Cooperative Computer and Information Science (1)
A seminar course for cooperative computer and information science students to be taken in the semester following each training assignment. A report of the training assignment must be submitted within four weeks of the beginning of the course. May be repeated up to 3 times.
Prerequisite: Consent of the Cooperative Education Coordinator.

CIS 413 Pattern Recognition (4)
Applications of digital computer techniques to a variety of problems in pattern recognition; linear decision functions, Bayes decision theory, maximum likelihood estimation, multivariate normal features, nonparametric techniques, feature selection, clustering, and unsupervised learning. Applications include industrial inspection and the processing of remote sensing, biomedical, and pictorial data.
Prerequisites: MTH 256, CIS 342, and a course in statistics.

CIS 416 Artificial Intelligence (4)
Introduction to artificial intelligence including: (1) current techniques in AI for knowledge representation and use, search methods, means-end analysis, network systems, production systems, frames, expert systems, genetic and other learning algorithms; (2) existing applications of AI with MYCIN, NETL, DENDRAL, checker player, chess player, natural language understanding; (3) an AI project requiring the creation of a working intelligent system in the student's area of interest.
Prerequisites: CIS 335, CIS 342 and major standing.

CIS 417 Applied Numerical Methods: Approximations (4)
Propagation of errors; classical methods for the solution of non-linear equations, summation of series, approximation of functions, numerical integration, numerical solution of differential equations and the Fast Fourier Transform. Emphasis on student development of general purpose subroutines for use in engineering and scientific applications.
Prerequisites: CIS 131, MTH 254 or 256 and major standing.

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

CIS 438 Programming Methodology (4)
Systematic approach to the design and analysis of computer programs. Program development cycle; semantical analysis of programs; program control structures and structured programming; abstract data structures; top-down step-wise refinement programming synthesis; testing; program metrics.
Prerequisite: CIS 342 and major standing.

CIS 439 Software Engineering (4)
The course will study, in a realistic environment, the techniques and methodology of developing

programs for user applications. Topics include specifications, top-down modular design, structured programming, documentation, testing, and verification.
Prerequisite: CIS 342.

CIS 445 Database Systems (4)
A study of the 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 data base systems are emphasized. A project involving an on-line data base system is normally assigned.
Prerequisite: CIS 342.

CIS 450 Operating Systems (4)
Introduction to computer operating systems. A multi-programming operating system is viewed as a collection of cooperating processes designed for efficient use of the resources of the computer. Process control and synchronization, memory management, and device management are the major topics.
Prerequisites: CIS 342 and either CIS 335 or a knowledge of PASCAL.

CIS 455 Introduction to Computer Graphics (4)
An introduction to the software and hardware aspects of computer graphics systems. Vector and raster displays. Typical data structures and programming language requirements. Emphasis on real time interactive graphics systems.
Prerequisite: CIS 342.

CIS 459 System Programming (4)
Introduction to the organization of computer systems with equal emphasis on both hardware and software as complementary entities. Views a system as a multilayer, hierarchically nested family of virtual machines. Topics: machine language level; executive (kernel) level; assembly level; batch, multiprogramming and time-sharing systems; file systems; design of multilevel machines. Class project.
Prerequisite: CIS 342, major standing.

CIS 465 Translation of Computer Languages (4)
The student is directed through development of a compiler for a simple language that can be executed on a simulated computer. Topics include: overview of grammars and languages; scanning input strings from a source language; parsing via bottom-up methods; internal forms for source programs; semantic routines; and symbol table organization. The compiler is constructed in a high-level language such as PL/1.
Prerequisite: CIS 342. Corequisite: CIS 335.

CIS 470 Microprocessors and Microcomputers (4)
Introduction to microprocessors and microcomputers; the CPU on a chip; interfacing microprocessors with external systems; programming considerations; logic design with microcomputers; hands-on laboratory experience. Credit may not be earned for both CIS 470 and ECE 470.
Prerequisites: CIS 280 and 342.

CIS 471 Microprocessor System Applications (4)
The design of microprocessor-based equipment and systems. Interfacing techniques; serial asynchronous and synchronous communications methods; direct memory access, A/D and D/A converters, peripheral interface devices, computer graphics. Project-oriented course. Credit may not be earned for both CIS 471 and ECE 471.
Prerequisite: CIS 470.

CIS 490 Computer and Information Science Project (2 to 8)
Independent work on an advanced project. Topic must be approved prior to registration. May be taken more than once.

CIS 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.

CIS 495 Special Topics (2 to 4)
Advanced study of special topics in computer and information science. May be taken more than once.

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The Board of Visitors for the School of Human and Educational Services is composed of outstanding leaders in the field of education and human services. The role of the Board of Visitors is to give advice and counsel to the dean and faculty of the School of Human and Educational Services. The board is asked to assist the School of Human and Educational Services in providing programs responsive to the learning and training needs of our public schools and human service agencies as they cope with a changing society in the complex technological and diverse culture of southeastern Michigan.

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UNDERGRADUATE CURRICULUM

The School of Human and Educational Services (formerly School of Education) offers programs preparing students for careers in teaching as well as related human service activities. The programs include a Bachelor of Science in elementary education, teaching certification for secondary education, and a Bachelor of Science in human resources development with specializations in early childhood, youth and adult services, and training and development. An advising office is located in 402 O'Dowd Hall, telephone 377-4182.

The elementary education program enables a person to secure a Michigan teaching credential which certifies one to teach all subjects K-8, as well as the ninth-grade subject areas of one's major or minor fields.

Requirements for the Bachelor of Science Degree in Elementary Education

In order to complete the Bachelor of Science degree, the student must:

1. Complete 125 credits.
2. Complete at least 32 of these credits at Oakland University.
3. Complete at least 32 of these credits in courses at the 300 level or above.
4. Take the last 8 credits needed to complete the baccalaureate requirements at Oakland University.
5. Have a cumulative grade point average of at least 2.50.
6. Be in substantial compliance with all legal curricular requirements.
7. Satisfy the university requirement of proficiency in English composition as described in the policies and procedures section of this catalog.
8. Complete or place out of by examination MTH 109 or 101, 102.
9. Complete a general education requirement of 25 credits.
10. Complete a core program of 24 credits.
11. Complete the childhood curriculum studies program of 28 credits.
12. Complete ED 455.
13. Complete a major concentration of 36 credits, or two minor concentrations of 24 credits each, in a field outside of education.

General Education Requirement

The student must complete all the following courses: ENG 345, SCS 105, ALS 176, MTE 310, MTE 311, and MUS 149. In addition, the student must also complete one of the following courses: SS 100, AS 210, 220, 230, 240, 250, or 260.

Admission to the Elementary Education Undergraduate Program

Criteria for admission to the elementary education undergraduate program include a grade point average of 2.50 for a minimum of 12 graded credits, a minimum grade of 2.50 in ED 110, and completion of the application form for program admission. Students who wish to obtain a major concentration in early childhood education may substitute ED 220 and 221 for ED 110, if a minimum grade of 2.50 is obtained in both ED 220 and 221. Courses which carry no numerical or letter grades are excluded from the calculation of grade point average.

A candidate for the elementary education program whose grade in ED 110 is lower than 2.5 must repeat ED 110 with at least a 2.5 before applying for admission to the program. ED 110 and admission to the program are prerequisites for all other elementary education courses.

Continuation in the Program

Grades in courses submitted for credit in the elementary education program must be 2.00 or better. To continue in the program, the student must maintain a minimum overall grade point average of 2.50. Students whose grades fall below the minimum may request review by the curriculum instruction and leadership extended area before registration for the next semester. Students who do not request a review will be dropped from the program.

A student will not be permitted to register for student teaching unless he/she has attained an overall grade point average of at least 2.50 at the time of application. Students not meeting this requirement may request one review by the Curriculum Instruction and Leadership Extended Area before registering for student teaching.

Core Program

The student in elementary education must complete the following core program of 24 credits.

1. Foundation

ED 110	Public Education for the Future

2. Philosophy, Sociology, Anthropology, History

ED 210	Social and Philosophical Issues in Elementary Education

Plus any two of the following:

ED 350a	Educational Implications
ED 350b	History of Public Education
ED 350d	The Formal Education of Women
ED 350e	Schooling and Social Stratification
ED 350f	Education and Moral Development
ED 350h	Independent Study

3. Human Behavior

ED 215	Educational Psychology for Elementary Teachers
ED 355a	Identifying and Diagnosing Learning and Behavior Problems in Children
ED 355b	Testing and Assessment
ED 420	Interaction Laboratory for Teacher Development

Childhood Curriculum Studies

The student in elementary education must complete the following courses in childhood curriculum studies:

ED 331	Teaching of Reading
ED 333	Teaching the Language Arts

ED 414	Reading Appraisal in the Elementary Classroom
ED 455	Internship
MTE 312	Intuitive Euclidean Geometry
MTE 313	Geometry, Statistics, Probability
PE 163	Movement Education
PE 363	Teaching Physical Education and Play Activity, Preschool to Grade 3
or PE 364	Teaching Physical Education and Recreation Activity, Grades 4 through 6
SCS 305	Teaching Science to Children
SS 470	Teaching Social Studies in the Elementary School

MAJOR/MINOR CONCENTRATIONS

A major (36 credits) or two minor concentrations (24 credits each) are required as part of the elementary education program. These are academic areas in which the student specializes. Designated required courses previously listed can also be used as part of these concentrations. Modifications can be made with adviser approval.

MAJOR OPTIONS

Fine Arts

Music: MUT 111, 211, and MUS 320; one MUA or MUE course; 2 credits from MUS 328, 329, 330, 331, 334, 345, 347, 348; 8 credits from MUS 233, 380, 383, 395, 403, 404, 441, 494, 496, 499, and MUT 212, 311, 312, and 314. Cognate: MUS 401, AH 100, and THA 420.

Art History Concentration: AH 101, 100 and 208 or 300; AH 350, 364, and 490. Cognate: MUS 149, AH 100, and THA 420.

Theatre Concentration: THA 100, 267, and 350; and three courses from THA 213, 230, 363, 450, and 462. Cognate: MUS 149, AH 100, and THA 420.

Language Arts

English: ENG 345; two courses from ENG 200, 301, 303, 304, 306, and 250; ENG 210 or 310; one course from ENG 300, 301, 312, and 342; and ED 333. Cognate: ALS 176 or LIN 207; one course from SCN 320, 321, THA 350, and 420; and ED 332.

Linguistics: ALS 176, LIN 207, 301, and 303; one course from ALS 335, 340, and 360; and ED 333. Cognate: ENG 345; THA 350, or 420; and ED 332.

Speech Communication: SCN 201, 320, or 321, and THA 420; two courses from THA 230, 267, 350, 450, SCN 375, 376, 305, and JRN 200; and ED 333. Cognate: ALS 176 or LIN 207; ENG 345; and ED 332.

Mathematics

MTE 310, 311; STA 225 or 226; MTH 121-122 or MTH 154-155, MTH 104-105; and MTE 410. Cognate: MTE 312 and 313 and an additional 4 credits in mathematics (MTE 418 suggested). (Mathematics courses not on this list may be taken with permission of the Department of Mathematical Sciences Education Committee.)

Mathematics/Science

MTE 310 and 311; SCS 105; MTE 410; any biology course; any physics course; and any chemistry course. Cognate: MTE 312 and 313, SCS 305, and one mathematics course from the mathematics major or one science course from the science major. (The combined mathematics/science grouping certifies a person to teach science only in the ninth grade.)

History/Social Science

Afro-American Emphasis: AS 230; HST 292 and 366; PS 103; SOC 205 and 331; AH 208. Cognate: SS 470 and ED 350.

Disciplinary Approach: SS 100 and ECN 150; one course from AS 210, 220, 230, 240, 250, and 260; and four courses from HST 201, 202, 214, 215, PS 100, 131, and 305 (select at least one from history and at least one from political science). Cognate: SS 470 and ED 350.

Ethnic Studies: SS 100; five courses from AS 210, 220, 230, 240, 250, 260, AN 371, and AN 381; and SOC 331. Cognate: SS 470 and ED 350.

International Emphasis (African Studies): AS 230; HST 285; three courses from AN 251, 305, 352, SOC 381; and PS 333. Cognate: SS 470 and ED 350.

Latin American Studies: AS 250; five courses from AH 307, HST 261, 262, 363, 365, 366, 367, PS 335, AS 300, 385, 390; and AS 490. Cognate: SS 470 and ED 350.

Problems Approach: SS 100; five courses from HST 100, PS 110, PSY 130, 220, 271, 310, 325, AN 305, 310, 392, 460, SOC 205, 300, 331, 335, 336, 408 and 445; and one course from HST 491, PSY 480, AN 480, and SOC 480. Cognate: SS 470 and ED 350.

Urban Studies: SS 100; PS 305; and ECN 309; and HST 214-215, SOC 445. Cognate: SS 470 and ED 350.

Natural Science

BIO 104 and 105, or BIO 190 and 200; PHY 101-102, or PHY 106 and 107, or PHY 104 and 105 and CHM 104 and 140 or CHM 144-145. (The student is also strongly urged to take the accompanying 1-credit laboratories with each course, if available.) Cognate: SCS 105 and 305. Recommended: one course from ENV 308, ENV 312, and BIO 301.

Modern Language

Courses in the chosen language numbered 111 and 114; 112 and 115; 211 and 214; 212 and 215; and 216, 314, 316, 318, 320, and 355.

MINOR OPTIONS

Fine Arts

Music Concentration: MUT 111 or 211; MUS 320; and selection from major concentration. Cognate: same as major.

Art History Concentration: One course from AH 101; AH 350; and any other AH course. Cognate: same as major.

Theatre Concentration: THA 100, 267, and 350. Cognate: same as major.

Language Arts

English: ENG 345, ED 333, and ENG 210 or 310. Cognate: same as major.

Linguistics: ALS 176 or LIN 207; LIN 301; and ED 333. Cognate: same as major.

Speech Communication: SCN 321, SCN 201, and ED 333. Cognate: same as major.

Mathematics

MTE 310, 311, 410, and one other mathematics course from the major list. Cognate: same as major.

Mathematics/Science

MTE 310 and 311, SCS 105, and one science course from science major listing. Cognate: MTE 312, 313, SCS 305, and one mathematics course from mathematics major listing. The combined mathematics/science grouping certifies a person to teach science only in the ninth grade.

History/Social Science

Afro-American Emphasis: AS 230; HST 292 and 366; and PS 103. Cognate: SS 470 and ED 350.

Disciplinary Approach: SS 100; one course from AS 210, 220, 230, 240, 250, and 260; and two courses from HST 201, 202, 214, 215, PS 100, 131, and 305. Cognate: SS 470 and ED 350.

Ethnic Studies: SS 100; two courses from AS 210, 220, 230, 240, 250, 260, AN 371, and 381; and SOC 331. Cognate: SS 470 and ED 350.

International Emphasis—African Studies: AS 230; PS 333; HST 285; and AN 305. Cognate: SS 470 and ED 350.

Latin American Studies: AS 250; and three courses from AH 307, HST 261, 262, 363, 365, 366, 367, PS 335, AS 300, 385, and 390. Cognate: SS 470 and ED 350.

Problems Approach: SS 100; and three courses from HST 100, PS 110, PSY 130, 220, 271, 310, 325, AN 305, 310, 392, 460, SOC 205, 300, 315, 331, 335, 336, 445, and 408. Cognate: SS 470 and ED 350.

Urban Studies: SS 100, PS 100, PS 305, and ECN 309. Cognate: SS 470 and ED 350.

Natural Science

Any 4-credit biology course, any 4-credit physics course, and any 4-credit chemistry course. Cognate: SCS 105, 305, and one course from ENV 308, 312, or BIO 301.

Modern Languages

Twenty-four credits in one language. Required courses 314, 316, 318. In addition ED 428 must be taken.

Optional Professional Concentrations

Students wishing to enhance the quality and breadth of their teaching credential may use their free electives in a professional concentration. At present these are available in the following fields:

Early childhood
Human resources development
International education/semester abroad
Reading and language arts

TEACHING CERTIFICATION FOR SECONDARY EDUCATION

The College of Arts and Sciences offers Bachelor of Arts degrees with certification for secondary teaching credentials provided by the School of Human and Educational Services. Majors are available in the following subject areas:

Social Studies
Music

Teaching minors are available in the following subject areas:

Biology
Chemistry
English
History
Physics
*Political Science
*Psychology
Science

Mathematics	Social studies
Modern languages	*Sociology
Music	Speech (see communication arts)

*These minors are for social studies majors only

SPONSORSHIP FOR MICHIGAN TEACHER CERTIFICATION

The state Department of Education certifies teachers in Michigan. It issues provisional certification to candidates deemed qualified by colleges and universities. This provisional certificate can be converted to a continuing certificate after a period of teaching and additional studies (see graduate catalog). Oakland University sponsors its graduates for the Provisional Elementary and the Provisional Secondary Certificate if the following requirements are met:

1. Elementary Education: Listed under requirements for B.S. degree in elementary education.
2. Secondary Education: Completion of a university baccalaureate degree with a teaching major and one appropriate teaching minor; and successful completion of ED 100, 200, 344, 345, 338, 427, 428. Social studies majors must also complete ED 370 and 454.
3. Elementary and Secondary Education: Completion of ED 455 (internship) with a grade of 2.50 or better.

Undergraduate students applying for state certification must be accepted to a degree program in the School of Human and Educational Services.

THE MASTER OF BUSINESS ADMINISTRATION

For superior undergraduate students in any major, the School of Economics and Management offers the Master of Business Administration (M.B.A.) degree. This is a two-year professional program in management designed for the student with a nonbusiness undergraduate major. Undergraduate management or business majors may take a variation of the standard M.B.A. program.

For Oakland University undergraduates still working on a major other than one of the management areas, there is the possibility of obtaining both the undergraduate degree and the M.B.A. in an accelerated program. To be eligible, a student should have a grade point average in the top 15% of her/his major. The student should apply for the accelerated program in her/his junior year (see the *Oakland University Graduate Study Catalog*).

HUMAN RESOURCES DEVELOPMENT

The School of Human and Educational Services offers a Bachelor of Science degree in human resources development (HRD). This program prepares students for service-action careers related to human problems, services, and social change. It provides an opportunity to acquire knowledge and skills usable in a wide range of human service activities. Students may select a major specialization in youth and adult services, training and development, or early childhood.

A major goal is to develop potential leaders who have the analytic abilities, communication and organization skills, and experimental know-how to respond to human needs in an era of rapid social change. The basic approach to the program is joining of understanding, skills, and service. Problem-solving and decision-making abilities are developed through field experiences and an on-the-job internship.

Requirements for the Bachelor of Science Degree

Candidates for the degree of Bachelor of Science in human resources development must meet the following requirements:

1. Complete 124 credits.
2. Complete at least 32 credits at Oakland University.
3. Complete at least 32 credits in courses at the 300 level or above.
4. Take the last 8 credits needed to complete the baccalaureate at Oakland University.
5. Have a cumulative grade point average of at least 2.00.
6. Be in substantial compliance with all legal curricular requirements.
7. Satisfy the university requirement of writing proficiency.
8. Complete 32 credits of general education with 3 to 12 credits in at least five of the six designated areas.
9. Complete a minimum specialization of 64 credits in early childhood education, training and development, or youth and adult services, which consists of:
   a. 24-32 credits of courses in an area of specialization.
   b. 24-28 credits in supporting cognate courses.
   c. 8-12 credits of internship.
10. Have a cumulative grade point average of 2.50 in courses in the specialization.

General Education

The designated field groups and course subjects applicable to each are:

a. **Arts**
   AMS 201
   Art and art history courses (SA and AH)
   Music courses (MUS)
   Theatre courses (THA)
   Dance and movement courses (DAN 100, 101, 110, 111, 120, 121, 173, 200, 372, 373, 376)

b. **History, Philosophy, and Area Studies**
   AMS 202
   History courses (HST)
   Philosophy courses (PHL) except PHL 102 and 170
   Area studies courses (AS)

c. **Language and Thought**
   Foreign language courses (CHE, FRH, GRM, HIUR, IT, RUS, SPN, ML)
   Speech communication courses (SCN)
   PHL 102 and 170
   Journalism courses (JRN)
   Applied languages studies courses (ALS)
   Linguistics courses (LIN)

d. **Literature**
   AMS 203
   English courses (ENG)
   Literature courses (LIT)

e. **Mathematical and Natural Sciences**
   Mathematics courses (MTH or MOR, MTE, and STA)
   Biology courses (BIO)
   Science studies courses (SCS)
   Chemistry courses (CHM)
   PE 304
   Physics courses (PHY)
   Environmental courses (ENV)

f. **Social Sciences**
   AMS 204
   Sociology courses (SOC)
   Anthropology courses (AN)

Political science courses (PS)
Psychology courses (PSY)
Social studies courses (SS)

Note: New Charter College courses (NCC) may be counted in any of the above categories in which the subject matter applies, e.g., NCC 122 in social sciences, NCC 123 in literature. General education requirements may also be fulfilled through the Honors College program.

Specialization in Early Childhood

The human resources development degree program with a specialization in early childhood develops competencies for design, evaluation, and licensure of child care facilities and direction of child care centers, family and day care, and group day care homes. The program also provides education for training parents and paraprofessionals in the care and education of young children, as well as dealing effectively with young children and their development in a variety of settings.

Admission Requirements

Students may apply for admission to the early childhood program after satisfactory completion of ED 220 and 221. Criteria for admission include a grade point average of 2.50 for a minimum of 16 graded credits and a minimum grade of 2.50 in ED 220 and 221. Courses which carry no numerical or letter grades are excluded from the calculation of grade point average.

A student who wishes to enter the early childhood program but whose grade in ED 220 and 221 is lower than 2.50 must repeat ED 220 and 221 with at least a 2.50 before applying for admission to the program. ED 220 and 221 and admission to program are prerequisites for all other early childhood courses.

Continuation in the Early Childhood Specialization

Grades in courses submitted for credit in the early childhood program must be 2.0 or better. To continue in the program, the student must maintain a minimum overall grade point average of 2.50. Students whose grades fall below the minimum may request review by the early childhood faculty before registration for the next semester. Students who do not request a review will be dropped from the program.

A student will not be permitted to register for the internship unless she/he has attained an overall grade point average of at least 2.50 at the time of application. Students not meeting this requirement may request one review by the early childhood faculty before registering for student teaching.

Specific Requirements to Complete the Program

1. Area of Specialization (32 credits): ED 220, 221, 223, 224, 225, 320, 324, 325, and 326.
2. Cognate Courses (24 credits)
   a. PSY 271 and one course from AN 305, PSY 326, SOC 335, or a family-oriented social science course.
   b. Additional courses related to development of children, selected with adviser assistance. Possible choices are ED 320 or 450.
3. Internship (12 credits): ED 456 (Internship in Early Childhood).
   May not be taken with any other courses.

Specialization in Youth and Adult Services

This specialization has been developed in cooperation with agency and industry employers in the community. It prepares students for a wide variety of human service occupations in such settings as employment and training programs, proba-

tion and correctional guidance, mental health, substance abuse, youth or family services, and services for older persons.

Students develop helping profession competencies through human interaction courses, special topic courses in human resources development, and field experiences, culminating in the internship.

Admission Requirements

Students may be admitted to the youth and adult specialization after satisfactory completion of HI 361 and 363. Criteria for admission include a grade point average of 2.50 for a minimum of 16 graded credits and a minimum grade of 2.50 in HI 361 and 363. Courses which carry no numerical or letter grades are excluded from the calculation of grade point average.

An applicant whose grade in either HI 361 or 363 is lower than 2.5 must repeat the course and earn a grade of 2.5 before admission to the program.

Continuation in the Youth and Adult Services Specialization

Grades in courses submitted for credit in the 64-credit Specialization in Youth and Adult Services must be 2.00 or better. To continue in the program and to enroll in HRD 490 (internship), a student must maintain a minimum overall grade point average of 2.50 or better. Students not meeting this requirement may request one review by the HRD area faculty for permission to register for internship.

Specific Requirements to Complete the Program

1. Specialization courses (32 credits)
   a. Completion of a 16-credit core curriculum including HI 361, HI 363, HRD 362, and HRD 366.
   b. 12-16 additional credits in HI/HRD courses other than HRD 490.
2. Cognate courses (24 credits)
   a. One course in psychology, 200-level or above.
   b. One course in sociology or anthropology, 200-level or above.
   c. One social change course: HRD 401, ECN 309, ECN 343, PS 305, SOC 205, 314, 336, 350, 441, 468.
   d. A selection from HRD 301, 302, 402, or other behavioral science courses (200 level or above. PSY, SOC, AN, PS, ECN, MGT, ORG, HBS) to total 24 cognate credits.
3. Research or statistics (4 credits)
   One course within either the specialization or cognate requirement as follows: HRD 390—Special Project in Human Resources Development (applies to specialization course requirement) OR a course in research design or statistics: ECN 304, PSY 250, PSY 311, PSY 357, SOC 202, SOC 203, STA 225, STA 226 (apply to cognate course requirements).
4. Internship: HRD 490 (8-12 credits)

Specialization in Training and Development

Training and development is the process of systematically developing human resources within a work organization to create motivation and increase efficiency. The specialization in training and development requires course work in behavioral sciences, human relations, training, and program delivery. These courses provide preparation for a variety of careers in government, health and human services, and business and industry. An internship during one semester of the senior year provides work experience in an appropriate setting.

Admission Requirements

Students may be admitted to the training and development program after completion of 16 graded credits with a grade point average of 2.50. Criteria for admission include completion of a beginning college level course in economics, sociology, psychology, and English composition (writing proficiency).

Continuation in the Training and Development Specialization

Grades in courses submitted for credit in the training and development specialization must be 2.0 or better. To continue in the program, a student must maintain a minimum grade point average of 2.50. Students not meeting this requirement may request one review before registering for internship.

Specific Requirements to Complete the Program

1. Specialization courses (28 credits)
   a. One course in each of the following categories
      (1) HI 361, 363, 461, 463
      (2) HRD 362, PSY 311
      (3) HRD 310, HRD 369, HRD 390
      (4) HRD 364, HRD 467, HRD 469, SOC 455
      (5) HI 464, HRD 420, HRD 421
      (6) RHT 335 or equivalent
   b. An elective chosen from categories 1-5 above, or from the following to total 28 specialization credits.
      (7) HRD 366, HRD 368, HRD 469, PE 304
2. Cognate courses (24 credits)
   The cognate requirement may be satisfied by completion of the management minor and a computer literacy course; or by completion of
   a) One course in three of the following areas:
      (1) ED 345, PSY 331
      (2) HRD 401, ORG 330, ORG 331, ORG 434
      (3) ECN 200, ECN 201, ECN 338, ECN 468
      (4) HRD 402, PS 350
      (5) MGT 433, NCC 301, ORG 437, SOC 350, SOC 357

   plus:
   b) One course chosen from each of the following categories.
      (6) ECN 250/QMM 250, HRD 390, ORG 430, PSY 250, SOC 202, SOC 203
      (7) CIS 122, CIS 224/ED 294, CIS 325/ED 295

   and if necessary
   c) Electives chosen from any of the seven categories above to total 24 cognate credits
3. Internship: HRD 490 (8-12 credits)

MINOR IN HUMAN RESOURCES DEVELOPMENT

For students in other majors who wish to combine their major with an introduction to human interaction skills and knowledge and techniques in human resources development, the School of Human and Educational Services offers the minor in human resources development.

The requirement for a minor in human resources development is 24 credits in human interaction (HI) and human resources development (HRD) courses including a minimum of 8 credits of HI and 8 credits of HRD courses, subject to approval of an HRD adviser. To obtain the minor in HRD the student must complete the 24

credits required with an average grade of 2.50 or better and with not less than 2.0 in any course.

RELATED CONCENTRATIONS AND MINORS

The gerontology concentration, co-sponsored by the School of Human and Educational Services and the College of Arts and Sciences is recommended for HRD students planning careers of service to older people. See page 151 for a description of the gerontology concentration.

HRD students should also consider the following concentrations or minors which supplement the HRD major and further their educational/career goals.

Applied Statistics
Environmental Studies
Health Behavioral Sciences
Management Minor
Psychology Minor
Social Justice and Corrections
Social Services
Urban Studies
Women's Studies

EDUCATION COURSE OFFERINGS

ED 100 Tutoring Experience in Secondary Education (2)
Students work with teachers and secondary students in schools. Students commit 60 to 80 hours as tutors, teacher aides, and leaders of group discussions. To be taken in the freshman year, or for transfer students, during the first semester, upon entering the secondary social studies program.
Corequisite: ED 200.

SCS 105 Science for the Elementary Teacher (4)
See page 253.

ED 110 Public Education for the Future (4)
To help beginning elementary education students make career decisions. Students work at least four hours per week in educational institutions. An additional two hours per week of class time is spent examining school practices and evaluating students' professional capabilities. ED 110 is a prerequisite for all other education courses in the elementary education program.

ED 200 Micro-Teaching in Secondary Education (2)
Students identify areas of inquiry related to secondary schools and design personal learning plans which include personal goals for working effectively in a public school. Current educational literature is used to inquire into creativity, self-perception, critical thinking, educational philosophy, motivation, and learning theory.
Corequisite: ED 100.

ED 210 Social and Philosophical Issues in Elementary Education (4)
Introduction to the use of philosophical and social science skills in analyzing and resolving education problems.
Prerequisite: ED 110 and admission to the program.

ED 215 Educational Psychology for Elementary Teachers (4)
Incorporates and places into perspective learning theories, developmental theories, biological theories, and evaluation, with emphasis on the effects of varied qualities of experience during childhood.
Prerequisite: ED 110 and admission to the program.

ED 220 Early Childhood Development—Experiences with the Young Child (4)
Child development. Instruction, observation, and experience with focus on children and their developmental needs during infancy and early childhood, especially in the context of particular settings. Students must register concurrently for ED 221.

ED 221 Early Childhood Development Experience Block (1, 2, 3, or 4)
Experience in a setting with young children. One credit must be taken concurrently with ED 220 and 224. Students who take additional credits of ED 221 must be taking another early childhood course concurrently.

ED 223 Physical and Social Environment in Early Childhood Programs (4)
Various aspects of the social and physical environment for young children. Includes analysis of what makes a healthful, pleasant physical environment and how the roles and relationships of various staff members contribute to this environment.
Prerequisite: Admission to early childhood program taken with no more than one other early childhood course.

ED 224 Early Childhood Programming Activities for the Young Child (4)
Uses of various media and materials, supportive play activities, and specific art, music, science, language, and other educational activities for young children. Provides a basic repertoire of skills for the early childhood staff member.
Prerequisite: ED 220 or equivalent. Corequisite: ED 221.

ED 225 Health and Nutrition—Childhood (4)
Includes knowledge of basic health and safety requirements and basic nutritional and dietary needs for early childhood.
Prerequisite: Admission to early childhood program taken with no more than one other early childhood course.

SCS 305 Teaching Science to Children (4)
See page 253.

ED 320 Topics in Early Childhood Curriculum (2 or 4)
Selected curriculum topics relevant to early childhood teachers, with focus on specific curriculum areas identified by advanced early childhood students or special groups working in this field.
Prerequisite: Completion of at least two 200-level early childhood courses.

ED 322 Introduction to Early Childhood: Theory and Practice (4)
Introduction to the field of early childhood: growth and development of infants and young children, optimal learning environments for the young child, and methods and materials. For students who wish some background in early childhood but who are not HRD/ED majors. Students must register concurrently for ED 221.
Prerequisite: ED 210 and 215 or permission of instructor.

ED 324 Parent and Community Involvement in Early Childhood Programs (4)
In-depth study of home/school coordination and education. Development of skills and sensitivities in the areas of parent education, parent-teacher conferences, utilization of parents in the classroom, and working with parents in the home.
Prerequisite: At least two 200-level childhood courses, or permission of instructor.

ED 325 Learning Environment in Early Childhood (4)
In-depth study of the learning environment and curriculum in early childhood education, including theoretical and practical aspects. Analysis of curriculum areas as they relate to individual children's needs and to the total learning environment.
Prerequisite: At least two 200-level early childhood courses, to be taken with no more than one other early childhood course.

ED 326 Introduction to Early Childhood Program Operation (4)
Overview of types of program operation in early childhood. Designed to give teacher and child-care development majors the skills to direct programs which are in operation.
Prerequisite: At least two 200-level early childhood courses, to be taken with no more than one other early childhood course.

ED 331 Teaching of Reading (4)
Intensive preparation for the teaching of reading skills in the elementary grades. Identification of reading readiness, problems of program construction, and a variety of teaching methods are included. Must be taken with ED 333.
Prerequisite: ED 210 and 215 or ED 344 and 345.

ED 332 Literature for Children (4)
The ability to evaluate children's literature critically, to understand its history, to assess children's needs and developmental levels, and to be able to select and use quality literature effectively with children are major objectives of the course.
Prerequisite: LS 101 or equivalent.

ED 333 Teaching the Language Arts (4)
Preparation for teaching language arts in the elementary, middle, and early secondary schools. Topics include teaching composition, creative writing, oral language development, listening, spelling, reading, and the application of linguistic principles. Must be taken with ED 331.

ED 338 Teaching Reading in the Content Areas (4)
A basic course in reading for prospective secondary teachers. Content will deal with the nature of the reading process and methods and materials for teaching the reading of English, social studies other subjects to junior and senior high school students. Not open to elementary education majors.

ED 344 Social and Philosophical Issues in Secondary Education (4)
Study of secondary education in broad perspective, as both an interpersonal activity and a social institution. Topics include immediate and ultimate aims of secondary education, the social meaning of the schooling process, and the assumptions underlying school policy.

ED 345 Psychological and Field Studies in Education (4)
Psychological factors in learning and development are examined in lectures, class discussions, and observations. These may be observations of actual teaching in the schools, or of videotapes of teaching.
Identical with PSY 345.

ED 350a Educational Implications of Family Roles and Child Rearing Practices (2)
Educational implications of anthropological, sociological, and psychological analyses of child-rearing practices in different cultures.
Prerequisite: ED 210 and 215.

ED 350b History of Public Education in the U.S. (2)
Social, philosophical, and historical ideas and events which led to the origin and development of the U.S. public school.
Prerequisite: ED 210 and 215.

ED 350d The Formal Education of Women (2)
Effects of formal and informal structure of the school on the development of women in contemporary society.
Prerequisite: ED 210 and 215.

ED 350e Schooling and Social Stratification (2)
The role of public schooling in theory and in practice as it relates to patterns of social stratification in the U.S. and other nations.
Prerequisite: ED 210 and 215.

ED 350f Education and Moral Development (2)
Prepares the student to be competent in understanding and guiding the moral development of the child.
Prerequisite: ED 210 and 215.

ED 350h Independent Study (2)
An opportunity to pursue a problem of particular interest to students, using the skills of philosophical and sociological analysis. Students work in groups or individually under the guidance of a teacher or teachers.
Prerequisite: ED 210 and 215.

ED 355a Identifying and Diagnosing Learning and Behavior Problems in Children (2)
Topics include individual differences among normal school population; delivery of educational services to handicapped persons; various theoretical models of behavior; and various statutes that govern special education in Michigan.
Prerequisite: ED 210 and 215.

ED 355b Testing and Assessment for Teachers (2)
Prepares a teacher-in-training to make effective use of formal, informal, and teacher-created assessment techniques in the process of planning, implementing, and evaluating instruction.
Prerequisite: ED 210 and 215.

ED 370 Field Problems in Social Science (4)
To assist prospective social studies teachers in identifying and solving instructional problems. Students are placed in school to work with teachers and secondary students, operating through a written contract agreed upon by themselves, an appropriate secondary school official, and a representative of the social studies program. Transportation must be arranged by the student.
Prerequisite: ED 100 and 200.

ED 414 Reading Appraisal in the Elementary Classroom (4)
Involves direct classroom appraisal of reading abilities of children in elementary school classrooms. Formal and informal diagnostic instruments are used. Diagnostic data are used for prescriptive teaching. Specifically involves reading instruction with pupils and involvement with school personnel.
Prerequisite: ED 331. Corequisite: ED 455.

ED 420 Interaction Laboratory for Teacher Development (4)
Acquaints students with the importance of human relations skills in teaching and provides a clearer understanding of the flexible line separating personal and professional behavior. Laboratory activities involve the student in role-playing and action-oriented problem solving. A field experience is included.
Prerequisite: ED 110, 210, 215, 350, and 355.

ED 427 Methods for Teaching Secondary Students (2)
Focus is on the uniqueness of the secondary classroom and the secondary student. Special emphasis will be placed on the development of teaching strategies and human interaction techniques appropriate for teaching secondary students. Such topics as discipline, motivation, instructional technology, skill assessment, evaluation, and affective learning will form the learning "core" around which students will be expected to develop the interaction and process skills needed to teach secondary students.
Corequisite: ED 428.

ED 428 Teaching of the Major Field (2)
Content and methodology appropriate to the student's major field. Organization of programs and courses, bibliography of the field, and techniques of instruction receive special emphasis. Must be taken concurrently with ED 455, except when other provisions have been made by the major department.
Prerequisite: ED 344 and 345. (For social studies majors, the following are also required: ED 100, 200, 370, and SS 100.)

ED 450 Advanced Studies in Early Childhood (2 or 4)
Current issues affecting the field of early childhood, especially those related to current legislation, child advocacy, and the child welfare concern; research methodology appropriate for young children; and/or in-depth issues such as development of infants or exceptional children.
Prerequisite: Completion of all 200-level early childhood courses and at least two 300-level early childhood courses.

ED 454 Skill Development Laboratories for Teaching Social Studies (4)
Interns meet weekly with instructor and supervisors to identify and solve problems such as discipline, course planning, grading, motivation, and interpersonal relationships and to share effective strategies. Emphasis is on mutual problem solving. Must be taken concurrently with ED 455.

ED 455 Internship (12)
Approximately 15 weeks of supervised teaching in a public school classroom and other activities as directed by a supervising teacher. Seminars are held throughout the semester focusing on general and specific teaching concerns of the interns. The semester may be divided into two segments for a dual assignment, depending on program requirements or student needs. A student must complete the internship in his/her last semester (a last semester is one in which a student needs no more than 16 credits to satisfy all graduation requirements). A student must apply for internships one full semester in advance. Except for ED 427, 428. A secondary student may not take any other course work concurrently with ED 455.
Prerequisite: Elementary education majors must complete the core program, general education, and childhood curriculum studies requirements; secondary education majors must

complete ED 100, 200, 338, 344, 345, and secure permission of the major department and the School of Human and Educational Services. Concurrent registration in ED 428 is required unless other provisions have been made by the major department. Prospective student teachers must register at the Office of Field Services at the beginning (before September 15 or January 15) of the full semester before student teaching.

ED 456 Internship in Early Childhood (12)
Work in practicum settings with young children, parents, or caregivers. Students will gradually assume total responsibility for an intensive field experience. Consists of 301 hours of on-site practicum. Includes bi-weekly seminar. No other courses may be taken concurrently and it is strongly advised that the student not be employed.
Prerequisite: 24 credits in early childhood courses with a 2.50 grade point average.

SS 470 Teaching Social Studies in Elementary School (4)
See page 253.

ED 490 Independent Study and Research (2 or 4)
A program of directed individual reading and research.
Prerequisite: Permission of the Department of Teacher Education (granted only if a student presents written faculty consent to supervise his/her study).

SCS 490 Independent Problems in Science Education (2 or 4)
See page 253.

HUMAN INTERACTION COURSES

HI 261 Fundamentals of Human Interaction (4)
Introduction to key aspects of interpersonal relationships such as self disclosure, feedback, conflict, trust and nonverbal communication. Examines various theories of healthy relationships and personal maturity. Self-appraisal, role plays, simulations and group interaction are used.

HI 361 Techniques of the Helping Interview (4)
Emphasizes listening and responding skills, establishing mutual trust and acceptance, and providing support in a one-to-one relationship to help persons make decisions. Includes an introduction to the theory and research of the helping relationship. Techniques of instruction include role-playing, simulation and analysis of videotaped interviews.
Prerequisite: HI 261 or equivalent.

HI 363 Dynamics of Group Relationships (4)
Deals with relationships among workers, 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.

HI 461 Introduction to Counseling (4)
Theory and practice of guidance and counseling in brief. Covers professional, ethical and legal issues in helping others. Compares major counseling approaches in both theory and application.
Prerequisite: HI 361 and 363.

HI 463 Group Procedures in Helping Relationships (4)
Theory and practice of small group process in the helping relationship. Explores several approaches to group leadership and offers an opportunity to experience and/or lead small groups in order to prepare students to foster group interaction. Identical with ED 463.
Prerequisite: HI 363.

HI 464 Techniques of 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.

HUMAN RESOURCES DEVELOPMENT COURSES

HRD 301 The Nature of Man (4)
The various ways in which human nature has been understood, with attention to the

behavioral, humanistic, Marxist, and Christian beliefs about man and their implications for policies and practices in the teaching and helping professions. Strives to develop tolerance for alternative views of man, and to appreciate the varieties of human behavior.

HRD 302 Ethics and Personal Crises (4)
Ethics as related to the personal crises of sexual behavior and lifestyles, abortion, suicide, euthanasia, parenthood, and criminal punishment. Focus is on helping others make a moral decision and handling value conflicts in counseling.

HRD 310 Training Design (2, 4)
Study of instructional design models for adult needs analysis, occupational task analysis, development of competencies and learning objectives, determination of appropriate training approach, organization of modules and lessons, and development or selection and evaluation of instructional materials and media for training programs in business and industry. Same as VTE 310.

HRD 331 Introduction to Community Mental Health (4)
Includes a critical examination of current mental health treatment programs in local institutions, community mental health centers, and family-care programs. Covers the role of social and cultural factors in the onset of mental illness. Introduces roles in the helping process as a member of a treatment team and provides experience in carrying out some facet of a treatment plan under supervision.

HRD 335 Problems of Drug Abuse and Alcoholism (4)
Comprehensive study of the modes of prevention and treatment programs for substance abuse. Readings and reports include basic information about various drugs and alcohol, with history, categories and definitions, misuse, abuse, legitimate use, laws, attitudes, and reasons people abuse drugs.

HRD 362 Assessment of Youth and Adults (4)
Overview of techniques used to assess youth and adults for deciding on and implementing educational, occupational, and personal-social goals. Students are introduced to measurement terminology as well as techniques of test administration and interpretation. Emphasis is on the synthesis of data in case studies and in case conferences.

HRD 364 Career Development and Community Resources (4)
Sources of occupation, education, and personal-social information, and techniques for using guidance information in the helping process. Establishes a repertoire of knowledge about community agencies and resources. Students gather firsthand information from site visitations as well as through audio-visual and printed media.

HRD 366 Techniques of Human Resources Development (4)
Basic preparation for public service work in human resources development. Emphasis is on cooperation among preprofessional and professional workers (such as interviewers, teachers, and community agency personnel) and on employability and developmental work to assist disadvantaged youth and adults from various cultural backgrounds.

HRD 368 Work and Training Development (4)
Emphasizes work with employers and educators to develop jobs and training courses for persons enrolled in related employability training programs and other agency applicants. Includes appraisal of the needs of employers for persons with certain performance skills, development of on-the-job training programs, and related education.
Prerequisite: 12 credits in HI or HRD courses.

HRD 369 Field Work in Human Resources Development (2, 4, 6, or 8)
Supervised experiences in a variety of helping relationships in work settings such as schools, employment offices, social services agencies, and industry. Includes an orientation to various local community cultural settings and lifestyles. Experiences emphasize helping young people and adults adjust to education or work experience.
Prerequisite: Permission of instructor.

HRD 390 Special Project in Human Resources Development (2, 4, 6, or 8)
Directed reading, research, and study in an aspect of human resources development work. May be elected for independent study or taught as a workshop based on selected topics and issues in the field. The course may be taken more than once, for a total of 8 credits.
Prerequisite: Permission of instructor.

HRD 401 Human Service Organization Analysis (4)
Study of the structure of organizations that provide human services and development and the process of effecting changes leading to improved individual client development. Concerns the assigned role of counselors, teachers, and other helpers within agencies and schools, which may interfere with their helping functions.
Prerequisite: Junior standing and two courses in ED, HI, or HRD.

HRD 402 Human Services Delivery and Evaluation (4)
Systems analysis and experimental design for program development and research in human services. Emphasizes skills in developing performance objectives and in organizing and writing proposals for program development. Provides an opportunity to participate in systems design for delivery of a proposed human service or educational program.
Prerequisite: Junior standing and two courses in ED, HI, or HRD.

HRD 420 Instructional Methods and Media Use (2, 4)
Methods of instructing adults in training programs with the use of instructional materials and media. Emphasis is on the application of adult learning theory in classroom settings and on the evaluation of student learning based upon competencies. Includes teacher-student interaction, laboratory experience, simulation, and use of audio-visual equipment. Same as VT 420.
Prerequisite: HRD 310.

HRD 421 Micro-Teaching in Human Resources Development (2, 4)
Students identify a training module and design learning plans for teaching particular lessons. The lessons are presented in simulated or supervised situations and are critiqued and evaluated. Same as VTE 421.
Corequisite: HRD 420.

HRD 431 Death and Dying (4)
Seminar of the philosophical, religious, cultural, and psychological issues in death and dying. Topics include: religious views of death and after-life; ethical issues in suicide and euthanasia; cultural attitudes toward death and funerals; psychological studies of counseling the dying and the bereaved; children and death; forming attitudes toward one's own death. Recommended for upper-level students only.
Prerequisite: Two HI/HRD courses or permission of instructor.

HRD 467 Workshop (2 or 4)
An opportunity for community agency personnel and students preparing for applied human resources development work to develop various aspects of human services programs and practices. Sections are offered as needed for areas of emphasis which meet the current objectives and/or requests of agency or business and industry employers and directors of training programs for personnel skilled in human resources development. May be taken more than once for a total of 8 credits.
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 human resources development field. Class members select research areas and contribute their findings to the group. 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 490 Internship in Human Resources Development (4, 8, or 12)
A culminating experience where students apply their learning in a supervised experience to human resources development work with youth or adults as an intern in a community agency program.
Prerequisite: Senior standing, completion of 24 or more credits in HI or HRD courses with grade point average of at least 2.50, and permission of instructor.

VOCATIONAL AND TECHNICAL EDUCATION COURSES

VTE 310 Vocational Curriculum Planning (2, 4)
Study of instructional design models for vocational education, needs analysis, occupational task analysis, development of competencies and learning objectives, determination of appropriate instruction approach, organization of modules and lessons, and development or selection

and evaluation of instructional materials and media for secondary-school level vocational programs. Same as HRD 310.
Prerequisite: ED 345 or teaching experience.

VTE 420 Methods of Vocational Instruction and Media Use (2, 4)
Methods of instruction in vocational education programs with the use of instructional materials and media. Emphasis is on the application of learning theory in classroom settings and on the evaluation of student learning based upon competencies. Includes teacher-student interaction, laboratory experience, simulation, and use of audio-visual equipment. Same as HRD 420.
Prerequisite: VTE 310 or HRD 310.

VTE 421 Micro-Teaching in Vocational Education (2)
Students identify a vocational education instruction module and design learning plans for teaching particular lessons. The lessons are presented in simulated or supervised situations and are critiqued and evaluated. Same as HRD 421.
Corequisite: VTE 420 or HRD 420.

HEALTH-PHYSICAL EDUCATION COURSES

PE 163 Movement Education, Low Organized Games, and Leadup Activities to Movement Skills (2)
Perceptual-motor development and sensory-motor development activities and their relevance to movement in low organized games, leadup activities, and games for basic sports skills.
Prerequisite: Sophomore standing.

PE 202 Introduction, History, and Orientation to Health-Physical Education and Allied Fields (2)
To provide knowledge, interpretation, and understanding of health education, physical education, dance, intramural sports, extramural sports, sports clubs, school and community recreation, and interscholastic competitive athletics for boys and girls.

PE 207 American Red Cross Advanced First Aid and Prevention and Care of Activity-Oriented Injuries (4)
To provide knowledge, interpretation, understanding, and practice in immediate and temporary care for victims of accident or sudden illness until a physician arrives. To aid in approaches and procedures of "safety-proofing" facilities, equipment, supplies, and participants in athletic activities.

PE 211 American Red Cross Senior Lifesaving and Water Safety Instructor Course (4)
Principles and procedures for swimming, lifesaving, and water safety with participation, including physical skills examination and written examination. ARC certification upon successful completion of course.

PE 215 Muscular Relaxation (2)
Theory, instruction, and practice of skills necessary for muscular relaxation, as well as facts on muscle physiology. Students will use bio-feedback laboratory equipment.

PE 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 athletes. Laboratory experiences are provided for insight into the dynamics of human performance.
Prerequisite: BIO 104.

PE 363 Teaching Physical Education and Play Activities for Children Preschool through Grade 3 (2)
Philosophy, theory, and practice in activities compatible with the needs, growth, and development patterns; possible interests at various levels for classroom, multi-purpose room, gymnasium, and playground.
Prerequisite: Sophomore standing.

PE 364 Teaching Physical Education and Recreation Activities for Children Grades 4, 5, and 6 (2)
Philosophy, theory, and practice in activities, compatible with the needs, growth, and develop-

ment patterns; possible interests with emphasis on low organized games and leadup activities for team games.
Prerequisite: Sophomore standing.

PE 391 Practicum in Physical Education and/or Dance with Preschool and Primary School Children (2 or 4)
Experience in teaching and leadership in physical education and/or dance with preschool or primary elementary school children. Includes weekly group discussion of these experiences.
Prerequisite: PE 211, 271, 363, or 364.

PE 392 Practicum in Physical Education and/or Dance with Upper Elementary and Middle School Children (2 or 4)
Experience in teaching and leadership in physical education and/or dance with children, grades 4 through 7. One period per week involves group discussion of teaching and leadership experiences.
Prerequisite: PE 211, 271, or 364.

PE 393 Practicum in Physical Education and/or Dance with Atypical Children (2 or 4)
Experience in teaching and leadership in physical education and/or dance with handicapped children. One period per week involves group discussion of teaching and leadership experiences.
Prerequisite: PE 211, 271, 363, or 364.

PE 493 Cooperative-Independent Study in Physical Education, Dance, Recreation, or Competitive Athletics (4)
Cooperative-independent study with student recognizing a concern, outlining same and possible steps to a solution, building a bibliography and reading, building an observation schedule and observing, building an interview schedule and interviewing, consulting regularly with instructor, and completing written summation.

PE 495 Practicum-Seminar in Physical Education and Allied Areas (4)
Individual students delve into philosophy, theory, and practice in areas of concern with observation and possible participation, and sharing of the experience regularly with the group.

SCIENCE STUDIES COURSES

SCS 105 Science for the Elementary Teacher (4)
Science concepts and processes based on recent elementary school science education curricula. For education majors only.

SCS 305 Teaching Science to Children (4)
Students develop philosophies of the nature of elementary school science; why teach science and how children learn science. Knowledge and skills in planning instruction, using instructional models, integrating the curriculum, using current science materials, and evaluation. Field work is included.
Prerequisite: SCS 105, ED 110, 210, 215, and junior standing.

SCS 490 Independent Problems in Science Education (2 or 4)
Individual work in science methods and materials. Credits may be applied to a teaching major or teaching minor in science/mathematics. May include a field placement as well as development of specific teaching materials.
Prerequisite: SCS 305 and permission of instructor.

SOCIAL STUDIES COURSES

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

SS 470 Teaching Social Studies in Elementary School (4)
An opportunity to examine sources of instructional objectives and strategies, curriculum materials, and evaluative procedures for social studies education. Students completing the

course should be able to develop, defend, and implement an elementary social studies program. A field experience is included.
Prerequisite: ED 110, 210, 215, 355, and junior standing.

For a description of the social studies program leading to secondary teacher certification refer to the appropriate section in the College of Arts and Sciences.

SCHOOL OF NURSING

OFFICE OF THE DEAN
Andrea R. Lindell, Dean
Barbara Biallas, Assistant to the Dean
Sue Lindberg, Program Planning Adviser

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APPLIED NURSING INSTRUCTORS: *Carol Benton, Susan Fortin, Virginia Hosbach, Ingrid Johnson*

ADJUNCT CLINICAL INSTRUCTORS: *Joanne Harry, Susan McEwan, Jean Mohan, Janet Nagy, Eileen O'Connell, Genevieve Soltau, Elaine Wasserman*

The Nursing Program

The course of study combines general education in the humanities and the behavioral, biological, and physical sciences with special education in the theory and practice of nursing. Graduates qualify for employment as nurse practitioners in a variety of settings such as homes, community health agencies, hospitals, extended care facilities, and federal nursing services. Graduates also have the educational background necessary for graduate study in nursing.

The major purposes of the program are:

1. To prepare practitioners capable of independent functioning and able to develop nursing regimens and to enter the health care system for the purpose of meeting the nursing needs of individuals, families, groups, and communities.
2. To inculcate the nature and operation of identity in conduct for an image of self that is consistent, believable, and sustainable.
3. To prepare individuals capable of self-directed inquiry who view learning as a lifelong process.

The Oakland University School of Nursing also offers a Bachelor of Science in Nursing (B.S.N.) degree completion program for registered nurses. Registered nurses must complete all credits and/or courses prescribed in the B.S.N. curriculum. This completion may be achieved in several ways:

1. CLEP (College Level Examination Program) academic credit for what a person knows regardless of where or how they acquired the knowledge. CLEP Board, Princeton, N.J. 08540.
2. Transfer of credits. If a student has completed course work at another accredited institution and the course is determined to be of equivalent content by the School of Nursing Admission Committee, the student will not need to repeat the course at Oakland University.

3. Credit by examination at Oakland University. All sophomore and junior level nursing courses (33 credits) may be challenged.
4. Required course enrollment. If course requirements are not fulfilled by any method stated above the student must enroll and successfully complete the course. Students are required to enroll in the senior year nursing courses (24 credits).

This program as designed allows a student to proceed at his/her own pace.

The Prenursing Year

Students wishing to enter the prenursing year should have completed two years of high school mathematics (including algebra), one year of biology, and one year of chemistry (a grade of B or better is desirable). Overall, a grade of B or better is required.

For diagnostic purposes, all students before or during orientation take the Multi-Stage Math Placement Test, chemistry placement test, and the Writing Proficiency Test.

Prenursing students are not nursing students. During the freshman (prenursing) year students will complete a minimum of 28 credits (or the equivalent) of general education college work consisting of introductory courses in the physical and behavioral sciences and the humanities. These courses serve to introduce the student to the knowledge and principles embodied in the academic disciplines which he/she will need to incorporate into nursing practice. The School of Nursing will decide whether to accept a student into the professional part of the program after the student completes the prenursing requirements at Oakland University or equivalent courses at another institution. Successful completion of the freshman requirements is evidence of the probability of succeeding in the nursing program. The School of Nursing encourages and actively seeks applicants among males and minority students.

Admission to the School of Nursing

Application for admission to the nursing major occurs during the spring session of the prenursing year. Students wishing to be considered for admission are required to meet with the Program Planning Adviser to develop application materials. The School of Nursing has an enrollment quota which is filled with preference to applicants judged to be best qualified to undertake the program. Grades are therefore important, as they serve a natural, logical, and defensible function in evaluating and reporting.

Minimum Criteria for Admission to the Nursing Program

Admission of students is restrictive and selective and may occur either by progression of freshmen students currently enrolled at Oakland University or by transfer from other institutions. Consideration of students for the nursing program (sophomore year) will be based on the following:

1. Applicant's admissibility to and retention in the university.
2. A cumulative grade point average of 3.00 or above in prenursing courses taken at Oakland University and/or other institutions is required for consideration for entrance into the professional portion of the program. A minimum grade point of 2.0 is required in all prenursing courses.
3. Additional specifics to be met at the student's expense before beginning the sophomore year:
   a. Health history and physical examination to include inoculation for tetanus, skin testing for tuberculosis (and possible chest x-ray), rubella, and correction of any physical defects.
   b. Malpractice insurance ($1,000,000 coverage).

4. Submission of all required information to the School of Nursing by specified deadlines.

Requirements for the Bachelor of Science Degree in Nursing

In order to graduate with the B.S.N. degree a student must:

1. Have demonstrated writing proficiency by meeting the university standard in writing proficiency.
2. Have been admitted to candidacy for the B.S.N. by the university and the School of Nursing.
3. Have completed all credits and courses prescribed in the B.S.N. curriculum:
   a. 57 credits in the nursing component as prescribed by the School of Nursing.
   b. 50 credits in the humanities and the physical, biological, social, and behavioral sciences as corequisites to the nursing component and as prescribed by the School of Nursing.
   c. A minimum of 8 credits in mathematics.
   d. A minimum of 8 credits in electives.
4. Have a cumulative grade point average of 2.50 in all nursing courses.
5. Have completed a minimum of 128 credits.
6. Have completed at least 32 credits in courses at the 300 level or above.
7. Be in substantial agreement with all legal curricular requirements.
8. Be in compliance with all legal regulations of the School of Nursing.

Plan of Study

Prior to registration for the first nursing course each student will complete a Plan of Study in the Student Program Planning Office in the School of Nursing. The Plan of Study is a timetable of courses to be taken, and assures orderly progress toward satisfying degree requirements. The plan is completed by the student in consultation with the program planning adviser. Following is a model scheule:

Prenursing		Sophomore		Junior		Senior	
			FALL				
CHM 104	4	NRS 223	5	*NRS 322	2	*NRS 420	10
RHT 100	4	BIO 205	4	*NRS 323	4	NRS 422	2
MTH 103/104	4	BIO 206	1	*NRS 324	4	*Elective	4
AN 102 or		PSY 271	4	*NRS 325	1		
SOC 100	4	CHM 201	4	STA 225	4		
		*NRS 205	1				
			WINTER				
PSY 130 or		NRS 234	5	*NRS 332	2	*NRS 430	10
PSY 100	4	BIO 207	4	*NRS 333	4	NRS 432	2
RHT 101	4	BIO 208	1	*NRS 334	4		
BIO 200	4	BIO 307	4	*NRS 335	1		
PHY 141	4	PSY 331	4	PHL 318	4		
		*NRS 205	1	*Elective	4		

*Course may be taken either in the fall or winter semester.

Nursing students also completing the Honors College requirements need not take AN 102, SOC 100, PSY 100, and 300- and 400-level psychology electives.

Grade Point Policy

The following policy applies to all nursing course grades, clinical and theory.

Cumulative Grade Point: Students must maintain a cumulative GPA of 2.5 in all nursing courses.

PROBATIONARY STATUS/NON-CONTINUATION IN PROGRAM: A student earning a grade, clinical or theory, between 2.0 and 2.4 is placed on probation. A student earning a grade below 2.0 cannot continue in the nursing program.

For a student to remove the probationary status it is required that:

1) the grade in the next nursing course, clinical and theory, must be a 2.5 or above, and
2) within two nursing courses beyond that which placed the student on probation, the cumulative GPA in nursing courses must be a 2.5.

Any student failing to remove the probationary status will have their program reviewed by faculty to determine the student's remediation or termination in the academic program.

RECOMMENDATION FOR GRADUATION: Students must have a cumulative GPA of 2.5 to be recommended for graduation.

If a nursing student in the senior year earns a clinical or nursing course grade between 2.0 and 2.4 in the final semester, their eligibility for graduation will be determined by the cumulative GPA.

A minimum grade of 2.0 is required in all non-nursing courses except electives.

Clinical Placements

Students are placed in hospitals and other clinical agencies each semester. The clinical laboratory provides students with experiences in real life situations where there are opportunities to apply theory to practice in working with individuals, families, or groups. Cooperating agencies are located throughout the metropolitan area.

National Student Nurses Association

Prenursing students and nursing students are eligible and are encouraged to join and remain members of the National Student Nurse Association. NSNA is the mechanism through which students participate in planning and formulating policies related to the school.

National League for Nursing Accreditation

The Oakland University School of Nursing has accreditation by the National League for Nursing and approval from the Michigan State Board of Nursing.

Qualification for Licensure

Licensure is obtained through satisfactory performance on the licensing examination prescribed by the state of Michigan. Upon registration of the license, the nurse is known as a registered nurse (R.N.). Licensure in one state entitles a qualified holder to licensure by endorsement in other states.

COURSE OFFERINGS*

All nursing courses involve student learning experiences in the following settings: classroom, autotutorial laboratory, and clinical agencies in the community.

NRS 205 Independent Study in Physical Assessment and History Taking (1)
This course is designed to provide students with a basic framework of parameters for their assessment within the context of a total physical examination. Demonstration of physical examination skills, interpretation of normal findings in the adult and elderly clients and adequate recording of findings are the expected outcomes.

NRS 223 Introduction to Nursing I (6)
Two units have been designed to provide the basic format for the study of nursing in the sophomore year. They are entitled: "Introduction to the Conceptual Framework: Adaptation" and "The Professional Nurse: an Agent of Adaptation."

In NRS 223, both units are introduced with content such as the history of nursing, accountability in nursing, and principles of therapeutic communication presented. The nursing process, the method through which nurses practice, is explained and students are taught the first step in process, that of data collection, via a health history. Students are also encouraged to see the relationships between environmental and sociologic factors and the provision of good nursing care. The health/illness continuum, growth and development and transcultural variability underlie and help unify each content area.

NRS 234 Introduction to Nursing II (6)
In NRS 234 Units I and II are completed. The student is encouraged to look at psychologic and physiologic adaptation concepts as they apply to commonly occurring stress situations in health and illness. Topics involving immobility, the surgical experience, loss, grief, death and dying are covered as well as nursing interventions which foster maintenance of comfort, nutrition, elimination, oxygenation and the like. Once again variables associated with age and cultural background are interwoven throughout and nursing process is emphasized as a practice vehicle.

NRS 322 Pathophysiology (2)
This course examines how physiological functions are modified by disease processes.

NRS 323 Nursing of Children in Pediatric Settings (4)
Implications of increasingly complex variables related to health and illness in children. Emphasis is on the interaction of biological responses to stressors from birth through adolescence. Study provides the base for expanding competence in nursing skills centering on care function, and more sophisticated application of nursing process with clients in various clinical settings.

NRS 324 Nursing of Adults in Medical/Surgical Nursing (4)
Exploration of the effect of increasingly complex variables related to health and illness in the adult. Emphasis is on the interaction of biological responses to stressors in the adult life cycle. Study provides the base for expanding competence in nursing skills centering on care functions and more sophisticated application of nursing process with clients in acute care clinical settings.

NRS 325 Nursing Skills Lab: Medical/Surgical—Pediatrics (1)
On-campus practicum in the development of specific nursing care skills of a relatively complex nature.

NRS 332 Topics in Family Development (2)
This course examines the development and functioning of family systems and the impact of those systems on the development and function of the individual and parent.

NRS 333 Nursing of Children and Adults in Psychiatric/Mental Health Settings (4)
Study focuses on the care of children and adults in acute psychiatric settings. Includes exploration of variables affecting the development of psychopathology and emphasizes the development of nursing skills to provide care for patients experiencing acute psychiatric problems.

NRS 334 Nursing of Children and Adults in Maternity Settings (4)
Experience in the care of families throughout the maternity cycle. Emphasis is on the care of mothers and infants in the labor room, delivery and post partum settings. Focus is on variables contributing to a healthy pregnancy, normal delivery, and positive transition to parenthood.

NRS 335 Nursing Skills Lab: Obstetrics—Psychiatric (1)
On-campus practicum related to the development of nursing care skills relevant to the specialty area.

NRS 420 Community Health Nursing (10)
Exploration of the functions of the community health nurse with the individual, the family, and the community. Emphasis is on analysis of client adaptation to environmental stressors, nursing actions directed toward prevention of illness, restoration, maintenance, and promotion of public health, and collaboration with others in the community to achieve mutual goals.

NRS 422 NRS Research (2)
A broad overview of the research process in nursing. Includes content related to nursing theory, research design, data analysis strategies and computers in health care. Major emphasis is on the use of research concepts for the purpose of evaluating relevant research for use in nursing practice.

NRS 430 Advanced Nursing (10)
Examination of components and processes related to nurse leaders as agents of change. Emphasis is on theories and principles of administration, management and organization of health care agencies, and roles, responsibilities, and characteristics of nurse leaders within such organizations. Laboratory activities enable the student to use theories and principles and test hypotheses. Seminars provide opportunity to explore and discuss issues significant to nursing practice, identify relevant variables, and postulate outcomes.

NRS 432 Professional Nursing Topics Seminar (2)
This course is designed to provide the student knowledge about nursing as a profession. It will focus on helping the student identify and analyze major issues confronting the profession and their impact on nursing practice and the delivery of quality health care services.

NRS 490 Independent Study (Credit varies up to 12)
Options include the opportunity for selected students to participate in faculty research or preceptorships in areas of special interest.

*Nursing course content is presently being reviewed and may be modified. The number of credits required for the B.S.N. will remain constant.

CENTER FOR HEALTH SCIENCES

ASSOCIATE PROVOST AND DIRECTOR: *Moon J. Pak*

ASSISTANT TO THE DIRECTOR: *Arthur J. Griggs*

PROFESSORS: *Philip Singer, Carl R .Vann*

ASSOCIATE PROFESSOR: *Uwe Reischl*

ASSISTANT PROFESSORS: *Michael Chopp, Richard J. Rozek, Lynne Williams*

SPECIAL INSTRUCTORS: *Christine Pillow, Mary L. Sherman*

VISITING INSTRUCTOR: *Patricia W. Custer*

CONSULTING PROFESSORS: *Duane L. Block, David Jacknow, Ivan J. Mader, R. Ralph Margulis, Jr., Joseph A. Rinaldo, Jr., Joseph L. Schirle, Michael R. Schwartz, Robert L. Segula, Robert R. Silver, Gary J. Welsh, John R. Ylvisaker, Richard Zunker*

CLINICAL PROFESSORS: *Seymour Gordon, Gerald C. Timmis*

CLINICAL ASSOCIATE PROFESSORS: *George R. Gerber, Murray B. Levin, John R. Pfeifer, Renato G. Ramos, Alexander Ullmann*

CLINICAL ASSISTANT PROFESSORS: *Joseph A. Arends, Arnold M. Berman, Nitin C. Doshi, Creagh E. Milford, Rajendra Prasad, Thomas E. Schomaker*

CLINICAL INSTRUCTOR: *Robert C. Nestor*

PROGRAMS

The Center for Health Sciences is an academic and administrative unit offering degree and nondegree programs in health and medically related fields. Presently, programs leading to the Bachelor of Science degree include industrial health and safety (IHS), medical physics (MP), medical technology (MT), and physical therapy (PT). Other programs offered through the center include the concentration in health behavioral sciences and the medical review program.

HEALTH SCIENCE CORE CURRICULUM

Students entering Oakland University and interested in pursuing the baccalaureate programs in either medical technology or physical therapy will initially be enrolled as preprofessional majors and will be required to follow the health science core curriculum. Other students who wish to pursue an educational program leading to a career in the health sciences, but undecided as to which program to follow, will also be advised to pursue the health science core curriculum. This is the recommended program for such students, since it provides not only flexibility but also exposure to basic science courses necessary for any degree-requiring health program.

Admission to major standing in medical technology or physical therapy is both selective and competitive. Completion of the health science core curriculum is one prerequisite for admission.

Students pursuing either the baccalaureate program in industrial health and safety or medical physics are not required to follow the core curriculum. The specific course requirements are outlined under the program descriptions. Many of these course requirements are identical to the courses listed in the core curriculum. A

student beginning with the core curriculum and who later wishes to enter either of these two programs will have little difficulty in making the transition.

THE CORE CURRICULUM COURSES ARE:

BIO 190, 195, 200, 321 (or 207†)
CHM 144-145, 149, 203-204* (or 234-235*)
MTH 103, 104 (or MTH 154)
STA 221
PHY 101-102 (or 151-152), 158**
PSY 100 (or 130)**, 331**
HS 101
24 credits of general education
8 credits of free electives
*not required for PT major standing
**not required for MT major standing
†option for MT major standing only.

General Education Requirement

Students pursuing programs in medical physics, medical technology, and physical therapy are required to meet the general education requirement of the Center for Health Sciences as follows:

1. Complete 24 credits in general education courses. Up to 8 credits in English composition courses may be part of the 24 credits, but they do not apply to any designated field group. The designated field groups include: arts; history, philosophy, area studies; language and thought; literature; and social sciences.
2. Complete 4 credits of general education in at least two of the five designated field groups.
3. Complete at least 8 credits in a third designated field group.
4. Complete no more than 12 credits in any one designated field group.

Descriptions of the designated field groups appear in the College of Arts and Sciences section of this catalog. In addition to the courses listed there, the following courses also may be taken to meet the general education requirement: PHL 318 Ethics and the Health Sciences (history, philosophy, area studies field group); SCN 114-115 Introduction to American Sign Language (language and thought field group); HBS 200 Health Care Dimensions (social science field group).

The general education requirement may also be met by completing the general education program of the Honors College of arts and sciences.

Students pursuing the program in industrial health and safety must follow the general education requirements specified for that program.

GENERAL HEALTH SCIENCE COURSE OFFERINGS

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

HS 301 Introductory Pathology (4)
Basic principles of human pathology appropriate for students pursuing curriculums in the health related disciplines. Diseases of the major systems of the body are studied.
Prerequisites: BIO 200, 321.

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

HS 480 Biochemical Pharmacology (2)
Classification of drugs and an introduction to their use, abuse, and side effects. Structure-

activity relationship and biochemical basis of drug action on biological systems will be emphasized.
Prerequisite: CHM 203, BIO 321, 325 or equivalent.

PROGRAM IN INDUSTRIAL HEALTH AND SAFETY

PROGRAM DIRECTOR: *Utoe Reischl*

ASSISTANT PROFESSOR: *Richard J. Rozek*

CLINICAL ASSISTANT PROFESSORS: *Joseph P. Chu, Daniel Fink, May Chiu Ng*

CLINICAL INSTRUCTOR: *Richard J. Walcott*

The Bachelor of Science degree program in industrial health and safety (IHS) addresses the interests and aspirations of persons seeking responsible involvement in the field of occupational health and safety. State-of-the-art concepts in industrial hygiene and occupational safety are presented with relevant exposure to the basic physical, chemical, biological, and behavioral science disciplines. The program is multidisciplinary in nature and provides advanced specialized perspectives in the form of three course groupings: A, the physical/life science perspective; B, the social/behavioral science perspective; and C, the work organization perspective.

The curriculum is designed as a four-year baccalaureate program. However, students can obtain a certificate after completing the industrial health and safety "core" sequence of courses. This normally involves the successful completion of the first four semesters of course work.

A one-semester internship is required for both the certificate and the Bachelor of Science degree. This internship provides first-hand field experience in the practice of industrial hygiene and occupational safety. Internship placements will be the responsibility of the program and will include labor, industry, and government organizations.

Graduates of the program in industrial health and safety will find employment opportunities within industry, labor, and local, state and federal health agencies. Many courses in this program are scheduled in the evening to accommodate part-time students.

Requirements for the Degree of Bachelor of Science in Industrial Health and Safety

1. Completion of the general university undergraduate degree requirements.
2. Completion of 136 credits, as set forth in paragraphs 3 to 5 below.
3. Completion of a major program consisting of: IHS 100, 101, 110, 111, 202, 212, 303, 304, 330, 420, 440; BIO 200, 207; CHM 104, 201; MTH 104, 105; STA 225; PHY 101, 102, 158.
4. Completion of 16 credits in either perspective option A, B, or C (see description of perspectives).
5. Completion of 24 credits of general education. Specific requirements depend on program perspective pursued (see description of general education).

General Education Requirements

Depending on the IHS program perspective selected (option A, B, or C), the following general education requirements apply:

Option A

1. Completion of HST 302 History of the American Worker.
2. Completion of 8 credits in the social science field group. See list of course options under College of Arts and Sciences section of this catalog. Within the social science field group, the course HBS 200, Health Care Dimensions, also

qualifies as a general education elective.
3. Completion of 4 credits in each of three of the remaining four field groups: arts; language and thought; literature; and area studies/philosophy. See list of course options under College of Arts and Sciences section of this catalog.

Option B or C

1. Completion of HST 302 History of the American Worker.
2. Completion of 4 credits in each of the following field groups: arts; language and thought; literature; area studies/philosophy as described in the College of Arts and Sciences section of this catalog.
3. Completion of 4 additional credits in one of the field groups listed in the paragraph above.

IHS Program Perspectives

Sixteen credits are required in one of three perspectives; 8 or more of the 16 credits in courses at the 300 level or above. This, along with the 24 credits of 300-level or above courses in the curriculum, will satisfy the university requirement of 32 credits at 300 level or above.

The following clusters of option courses are designed to be flexible. There will be a continuous revision of this list, with close consultation of the involved departments. It is also hoped that the introductory courses (100-level courses) listed in options B and C can be waived for at least some of the students in the program who have demonstrated preparation for upper-level courses.

Students will receive close counseling and guidance in the selection of a perspective, as well as in the planning of courses for the selected option.

Option A: Physical/Life Science Perspective

BIO 205	(4)	Anatomy
BIO 321	(4)	Physiology
BIO 325	(4)	Introductory Biochemistry
BIO 319	(4)	General Microbiology
BIO 341	(4)	Genetics
PE 304	(4)	Exercise Physiology
CHM 225	(4)	Analytical Chemistry
CHM 339	(4)	Separations and Applied Spectroscopy
CHM 428	(2)	Analog Electronics for Chemistry
ENV 308	(4)	Introduction to Environmental Studies
ENV 312	(4)	Energy and the Environment
ENV 355	(3)	Environmental Health Practice
ENV 372	(3)	Air Chemistry
ENV 373	(3)	Water Resources
ENV 390	(1-6)	Directed Studies
ENV 461	(3)	Environmental Law and Policies
ENV 484	(3)	Environmental Toxicology
ENV 486	(3)	Toxic Substance Control
PHY 241	(2)	Introductory Electronics for Scientists I
PHY 242	(2)	Introductory Electronics for Scientists II
PHY 243	)2)	Introductory Electronics for Scientists III
CIS 120-121	(4)	Computer Programming

Option B: Social/Behavioral Sciences Perspective

HBS 200	(4)	Health Care Dimensions
HBS 400	(4)	Field Practicum in Health Behavioral Sciences
AN 333	(4)	Medical Anthropology
AN 392	(4)	Current Problems in Anthropology
AN 420	(4)	Ethnopsychiatry

PSY 100	(4)	Introduction to Psychology
PSY 350	(4)	Motivation
PSY 351	(4)	Learning, Memory, Thinking
PT 324	(3)	Physical Therapist/Patient Milieu
CIS 120-121	(4)	Computer Programming
SOC 100	(4)	Introduction to Sociology
SOC 357	(4)	Industrial Sociology
SOC 445	(4)	Urban Sociology

Option C: Work Organization Perspective

ECN 150	(4)	Basic Economics
ECN 309	(4)	Urban Economic Problems
ECN 310	(4)	Economics of the Environment
ECN 326	(4)	Economic Development
ECN 328	(4)	American Economic Development
ECN 338	(4)	Economics of Human Resources
ECN 347	(4)	Problems in Health Economics
ORG 330	(4)	Organizational Behavior
PS 350	(4)	Public Administration
IHS 431	(4)	Regulatory Aspects of Safety
CIS 120-121	(4)	Computer Programming

Requirements for the Certificate Option or Minor in Industrial Health and Safety

A certificate in industrial health and safety can be issued to students who complete the "core" sequence of IHS and basic science courses. A total of 68 credits must be completed including the following courses: IHS 100, 101, 110, 111, 202, 212, 240, 304; MTH 104, 105; CHM 104, 201; PHY 101, 102, 158; RHT 100, 101.

Students in the Bachelor of General Studies (B.G.S.) degree program who complete the requirements for the certificate option in IHS will be able to receive a *minor* in industrial health and safety. Bachelor of General Studies students should apply for this minor on forms available from the B.G.S. office.

COURSE OFFERINGS

IHS 100 Industrial Hygiene I (4)
Introduction to current concepts and issues in industrial hygiene and occupational health. Principles of recognition, evaluation, and control of hazards in the work environment. Environmental standards, environmental and biological monitoring, OSHA, worker productivity, threshold limit values.

IHS 101 Industrial Hygiene Health II (4)
Methods of environmental testing. Evaluation of occupational stresses found in selected work environments. Noise, heat, ventilation, microwave radiation, ionizing radiation, illumination. The role of labor and management in controlling environmental quality.
Prerequisites: IHS 100, CHM 104.

IHS 110 Industrial Safety I (4)
Introduction to current concepts in safety engineering. OSHA standards, human factors, accident investigation techniques, fault-tree analysis, legal aspects of safety.

IHS 111 Industrial Safety II (4)
Safety assessment for occupational environments. Analytical techniques, structural analysis, strength of materials, electrical safety, fire life-safety, medical management of injuries, personal protective clothing.
Prerequisite: IHS 110.

IHS 202 Industrial Hygiene III (4)
Advanced methods of environmental testing. Focus on air contaminants in the work environment. Analysis of toxic fumes and gases, dusts, and fibers. Analytical techniques for laboratory and field applications.
Prerequisites: IHS 100, CHM 104, MTH 105.

IHS 212 Industrial Safety III (4)
Introduction to concepts in security and protection of property, disaster response planning, hazardous materials handling during transport. Safety planning and management. Report preparation, writing, and oral presentations.
Prerequisite: IHS 110.

IHS 240 Industrial Health and Safety Internship (4)
Practical training and field exposure to industrial work settings. Intended only for students seeking the certificate in IHS.
Prerequisite: Departmental permission.

IHS 303 Industrial Toxicology (4)
Introduction to the basic concepts and techniques of toxicology with special attention given to industrial work environments. Evaluation of the effects of toxic substances on the human body. Focus on responses of various systems within the body to selected toxic agents.
Prerequisites: IHS 202, CHM 201, BIO 207.

IHS 304 Introduction to Epidemiology (4)
An introduction to the uses of epidemiology in public health practice, using selected diseases to illustrate the development of knowledge on disease causation and the application of such knowledge to disease control.
Prerequisite: IHS 202.

IHS 313 Fire Prevention and Protection (4)
Fundamentals of flame generation and propagation; fire behavior in open and confined spaces; theory of fire fighting methods; methods and devices for fire detection and suppression.
Prerequisites: IHS 202, IHS 212.

IHS 330 Environmental Standards (4)
Examines ambient and work place air, noise, radiation, water and pesticide standards. Topics will be analyzed in terms of standard development, enforcement at state and federal levels, and the validity of the standard's ability to protect health.
Prerequisites: IHS 202, IHS 212, PHY 102, PHY 158.

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

IHS 420 Public Health Engineering (4)
Planning, design, and survey of factors related to the physical aspects of environmental health with particular reference to industrial pollution control for water and air, waste, and life-safety in buildings.
Prerequisites: IHS 202, CHM 104, MTH 105.

IHS 431 Regulatory Aspects of Safety (4)
Survey of regulatory basis of accident prevention requirements; federal laws, codes, standards, court judgments, and procedures; case studies; worker influences.
Prerequisites: IHS 212, IHS 330.

IHS 440 Advanced Industrial Health and Safety Internship (4)
Field training in industrial safety and health in close collaboration with professional industrial hygiene and safety personnel. Exposure to health and safety program planning and evaluation. Graded S/N.
Prerequisite: Departmental permission.

IHS 450 Robotic Safety (4)
Information and issues related to worker safety in industrial environments where robots are used will be presented. The state-of-the-art of advanced automation will be surveyed with emphasis on system safety and injury prevention features required to assure an adequate worker/robot interface.
Prerequisite: Departmental permission.

IHS 451 Industrial Ventilation (4)
Design and control applications for reducing worker exposure to airborne contaminants. Concepts and principles of dilution and local exhaust ventilation will be presented. Methods for assessment of industrial ventilation systems required to prevent the accumulation of flammable or explosive concentrations of gases, vapors, or dusts.
Prerequisite: Departmental permission.

IHS 452 Industrial Noise Control (4)
Concepts in engineering controls required in the management of noise overexposure in industrial environments. Analysis of engineering design options and mechanical modifications effective in controlling worker exposure to undesirable industrial noise will be presented.
Prerequisite: Departmental permission.

IHS 453 Radiation Safety (4)
Safety aspects of occupational hazards associated with the use of ionizing radiation in industry will be presented. Methods for the identification, evaluation, and control of potential worker overexposure conditions will be reviewed. Biological effects of acute and chronic worker exposure will also be reviewed.

IHS 490 Independent Study (1-4)
Student initiated and problem-oriented independent study focusing on occupational health and safety issues. Graded S/N.
Prerequisite: Permission of instructor.

PROGRAM IN MEDICAL PHYSICS

DIRECTOR: *Abraham R. Liboff (Physics)*

ASSISTANT DIRECTOR: *Michael Chopp (Physics and Health Sciences)*

CLINICAL PROFESSORS: *Howard J. Dworkin, Harold D. Portnoy*

CLINICAL ASSISTANT PROFESSOR: *Ronald A. Rocchio*

Medical physics, a developing health-related professional field, is concerned with the use of physical techniques to diagnose and treat disease. In the past the subject played a vital part in the development of radiation therapy. Today medical physics also includes the physical aspects of X-ray diagnosis, nuclear medicine, radiation safety, ultrasonics, lasers, thermography, image intensification, EKG, and EEG. It is also involved in related areas such as patient monitoring and general medical instrumentation. In addition to clinical duties surrounding these techniques, medical physicists engage in research and development, consultation and service, and teaching of residents, hospital personnel, and undergraduates. Much of the progress made in the last decade in both diagnosing and treating cancer can be traced directly to the increasing use of physics in medicine.

The medical physics program is based on a group of physics courses, with relevant biology, chemistry, and mathematics courses added.

In their senior year, students take physics of diagnostic radiology and physics of nuclear medicine. In addition, students are placed in hospitals as medical physics interns. During this internship, they assist the resident medical physicist in providing clinical medical physics support and thereby gain direct experience in the clinical environment.

Interested students must consult with the assistant director for specific information and counseling.

Requirements for the Degree of Bachelor of Science in Medical Physics

1. Completion of the general university undergraduate degree requirements.
2. Completion of 128 credits, as set forth in paragraphs 3 to 7 below.
3. Completion of 24 credits of general education as described under the health science core curriculum.

4. PHY 151, 152, 158 or 159, 341, 347, 372, 318, 351, 371, 317, 361, 381, 441, 443, 442, 444.
5. MTH 154, 155, 254; STA 226; APM 257.
6. CHM 144, 145, 149, plus 4 additional credits at a level not below CHM 144. CHM 201 may be taken for credit.
7. BIO 200, 205, 207.

PROGRAM IN MEDICAL TECHNOLOGY

PROGRAM DIRECTOR: *Lynne Williams*

SPECIAL INSTRUCTOR: *Mary L. Sherman*

CLINICAL PROFESSORS: *Jay Bernstein, Richard H. Walker*

CLINICAL ASSOCIATE PROFESSORS: *James J. Humes, Donald J. Jarzynski, John H. Libcke, Kenneth R. Meyer, James W. Mitchener, Boris K. Silberberg*

CLINICAL ASSISTANT PROFESSORS: *A. Al Saadi, David W. Eckert, Evelyn R. Hansen, A. J. Levine*

CLINICAL INSTRUCTORS: *Dorothy Cummings, Susan Dingler, Geraldine Y. James, Sheralyn J. Johnson, Deanna Dupree Klosinski, Margaret M. Kluka, Ross R. Lavoie, Connie Probert, Carolyn A. Shalhoub, John T. Waugh, Robert Weimer*

The program prepares students for professional health career opportunities in either hospital clinical pathology or anatomical pathology laboratories. Medical technologists work under the supervision of a pathologist and are primarily responsible for operation of the clinical pathology laboratory, performing a wide variety of tests on which physicians base their diagnosis of a disease and formulate therapeutic plans. The medical technology program offers two specializations that prepare students for employment opportunities in the anatomical pathology departments of hospitals. Histotechnologists and cytotechnologists work under the supervision of a pathologist, aiding in the diagnosis of diseases based on tissue alterations.

Admission to the professional part of the programs is restrictive and selective and occurs in the winter semester of the sophomore year, either by progression of students currently enrolled at Oakland, or by transfer from other institutions. Whether the medical technology program will accept a student into the professional part of the programs is contingent on satisfactory completion of the health science core curriculum. The medical technology programs have enrollment quotas filled with preference to applicants judged to be best qualified to complete the programs. Admissions are based on grades, personal interviews, and, where appropriate, letters of recommendations.

Requirements for the Degree of Bachelor of Science in Medical Technology

1. Completion of the general undergraduate degree requirements.
2. Completion of 136 credits, as set forth in paragraphs 3 and 4 below.
3. Completion of the health science core curriculum.
4. Completion of the major course work for clinical medical technology, histotechnology, or cytotechnology.

Clinical Medical Technology

Medical technologists perform a wide range of diagnostic procedures, including procedures in hematology, clinical chemistry, microbiology, serology, urinalysis, and immunohematology (blood banking).

Students are accepted into the medical technology program after completion of the health science core curriculum. The junior year consists of the prescribed

academic program at Oakland, and the senior year consists of a 12-month affiliation at an approved hospital school of medical technology. Upon completion of the internship, the student must pass a national certification examination to become a registered medical technologist.

Currently, the following hospitals are affiliated with Oakland University: Flint Osteopathic Hospital, Flint; Harper Hospital, Detroit; McLaren Hospital, Flint; Oakwood Hospital, Dearborn; Pontiac General Hospital, Pontiac; Port Huron Hospital, Port Huron; Providence Hospital, Southfield; St. John Hospital, Detroit; St. Joseph Hospital, Flint, St. Joseph Mercy Hospital, Pontiac; William Beaumont Hospital, Royal Oak.

Clinical Medical Technology Course Requirements

Students accepted for clinical medical technology major standing must complete the following courses: BIO 365, 421, 422, 423, 325 and 408 (or CHM 453, 454, 457); MT 201, 315, 316, 326, 327, 328; 28 credits in clinical courses: MT 415, 416, 418, 421, 423, 428.

Specializations in Anatomic Medical Technology

Histotechnology

DIRECTOR: *A. Al Saadi*

CLINICAL INSTRUCTORS: *Dorothy Cummings, Connie Probert, Robert Weimer*

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

Students are accepted into the histotechnology program after completion of the health science core curriculum. 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 Course Requirements

Students accepted for histotechnology major standing must complete the following courses: BIO 205, 305, 306, 325, 429, 445, 341 (or 427), 423; MT 201, 312; 28 credits in clinical courses: HT 401, 402, 403, 404.

Cytotechnology

DIRECTORS: *E.G. Bernacki, (William Beaumont Hospital), Richard J. Pollard (Harper Hospital)*

ASSOCIATE DIRECTOR: *A.J. Levine*

CLINICAL INSTRUCTORS: *Susan Dingler, Ross L. Lavoie*

A cytotechnologist is a trained medical laboratory technologist who detects cell disease by light microscopic examination of cell samples from all areas of the human body. Students are accepted into the cytotechnology program after completion of the health science core curriculum.

The junior year consists of the prescribed academic program at Oakland, and the senior year consists of a 12-month internship at William Beaumont Hospital, School of Cytotechnology or Harper Hospital, School of Cytotechnology. The training program includes an integrated presentation of didactic material, micro-

scopic study, specimen preparation, clinical observation, cytogenetics, laboratory management, a research project, and a two-week rotation at a satellite hospital.

Cytotechnology Course Requirements

Students accepted for cytotechnology major standing must complete the following courses: BIO 205, 305, 306, 325, 341 (or 427), 393, 421, 423; MT 201, 312; 28 credits in clinical courses: CT 401, 402.

MEDICAL TECHNOLOGY COURSE OFFERINGS

MT 201 Careers In Medical Technology (0)
An introductory seminar in medical technology, including career opportunities in clinical medicine (medical technology, histotechnology, cytotechnology, industrial sales and/or research and development, basic medical research, and education. Graded S/N.

MT 312 Hematology/Cellular Pathophysiology (3)
Topics include current concepts of hematopoiesis, including selected topics in red blood cell, white blood cell, and platelet morphogenesis, physiology and pathophysiology; an introduction to the basic principles involved in cellular disease mechanisms.
Prerequisite: BIO 207 or 321; Permission of instructor.

MT 315 Medical Hematology I (3 or 4)
Theory and techniques in clinical microscopy, including urinalysis and body fluid analysis. Theory and techniques in blood coagulation and immunohematology, including normal functioning and pathological alterations. Class may be taken without lab for 3 credits.
Prerequisite: BIO 207 or 321; Permission of instructor.

MT 316 Medical Hematology II (3 or 4)
Theory and techniques in hematology, including red blood cell, white blood cell, and platelet morphogenesis, physiology, and pathophysiology. Class may be taken without lab for 3 credits.
Prerequisite: BIO 207 or 321; Permission of instructor.

MT 326 Instrumentation Lecture and Laboratory (1)
An introduction to the theoretical and practical aspects of clinical instrumental analysis. Includes practical experience in the calibration, operation, and preventive maintenance of laboratory instruments.

MT 327 Clinical Chemistry (3)
A theoretical introduction to the fundamentals of clinical chemistry with emphasis on pathophysiology and clinical correlations.

MT 328 Clinical Chemistry Laboratory (1)
Provides practical experience in the application of clinical instrumentation and current clinical methodologies to the performance of clinical chemistry assays.

MT 405 Special Topics (1, 2, 3, or 4)
Prerequisite: Permission of instructor.

MT 415 Clinical Practicum—Urinalysis/Coagulation (3)
Didactic and practicum experience at an affiliated hospital school of medical technology, in the fields of urinalysis and coagulation.
Prerequisite: Permission of instructor.

MT 416 Clinical Practicum—Hematology (5)
Didactic and practicum experience at an affiliated hospital school of medical technology, in the area of hematology.
Prerequisite: Permission of instructor.

MT 418 Clinical Practicum—Immunohematology (4)
Didactic and practicum experience at an affiliated hospital school of medical technology, in the field of immunohematology.
Prerequisite: Permission of instructor.

MT 421 Clinical Practicum—Microbiology (7)
Didactic and practicum experience at an affiliated hospital school of medical technology, in the field of medical microbiology, including parasitology and mycology.

Prerequisite: Permission of instructor.

MT 423 Clinical Practicum—Serology (2)
Didactic and practicum experience at an affiliated hospital school of medical technology, in the field of serology.
Prerequisite: Permission of instructor.

MT 428 Clinical Practicum—Chemistry (7)
Didactic and practicum experience at an affiliated hospital school of medical technology, in the field of clinical chemistry.
Prerequisite: Permission of instructor.

MT 451 Clinical Education (6)
Prerequisite: Permission of instructor.

MT 490 Individual Laboratory Work (2-4)
Prerequisite: Permission of instructor.

MT 497 Apprentice College Teaching (2)
Directed teaching of selected undergraduate courses. May be repeated for credit. Graded S/N.
Prerequisite: Permission of instructor.

HISTOTECHNOLOGY COURSE OFFERINGS

HT 401 Basic Histotechnique and Histochemical Staining Methods (12)
Didactic and practicum experience in preparing histologic sections for light microscopy, including the study of over 50 different histologic and histochemical staining methods and their specific applications.

HT 402 Basic Electron Microscopy (8)
Didactic and practicum experience in basic biological electron microscopy. Electron microscopic histochemistry and special techniques are also covered. Emphasis is on the electron microscope as a medical diagnostic tool.

HT 403 Immunohisto-cytochemistry (4)
A course designed to teach basic and advanced procedures of fluorescent and enzyme-labeled antibody techniques. The course includes the preparation of tissues, staining with labeled antibodies and the use of the fluorescence microscopy in clinical medicine and research.

HT 404 Cytogenetics (4)
An intensive course in human cytogenetics. Human chromosome methodology, chromosome identification and chromosomal abnormalities and their application in clinical medicine.

CYTOTECHNOLOGY COURSE OFFERINGS

CT 401 Clinical Internship (14)
Tissue preparation and staining techniques; microscopic study of cellular alterations indicative of cancer and precancerous conditions, bacterial, viral, and parasitic infections, and hormonal abnormalities; cytogenetics; and a research project.
Prerequisite: Permission of instructor.

CT 402 Clinical Internship (14)
Continuation of CT 401.

PROGRAM IN PHYSICAL THERAPY

INTERIM PROGRAM DIRECTOR: *Alfred W. Stransky*

SPECIAL INSTRUCTOR: *Christine Pillow*

VISITING INSTRUCTOR: *Patricia W. Custer*

CLINICAL PROFESSOR: *Charles Dorando*

CLINICAL INSTRUCTORS: *Kristie S. Kava, James C. Pipp*

The physical therapy program has a three-fold purpose. The first is to provide an educational program which prepares students for the Bachelor of Science degree and a professional career in physical therapy. The second is to provide opportunities

for the advancement of knowledge in physical therapy through research. The third is to provide service to the public. This is done, in part, through continuing education courses and lectures, and by providing a resource of physical therapy expertise. With this three-fold purpose, the physical therapy program is an integral part of the university, providing students the opportunity to develop personal skills for productive citizenship along with the professional skills of physical therapy.

Physical therapy is an integral part of the health care system. The physical therapist is concerned with the prevention and treatment of acute and chronic conditions which cause disorders of movement. In order to provide appropriate treatment, a thorough knowledge of the neuromusculoskeletel and cardiopulmonary systems is paramount so that each person can be evaluated and problems identified. From this evaluation, a therapy program is developed to resolve each problem. Working in concert with the referring physician, the physical therapist and physician continually maintain contact regarding each patient's progress.

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

Physical therapy students follow a four and one half year academic program at Oakland University based on the educational guidelines of the American Physical Therapy Association. The first two years are fulfilled by the health science core curriculum, while the remaining two and one half years can be completed only by students accepted as physical therapy majors. Acceptance into the professional phase of the program is competitive and selective and based on academic performance, letters of recommendation, exposure to the profession, and personal interviews. Application for major standing typically occurs in the winter semester of the sophomore year and may be initiated by students currently enrolled at Oakland or by transfers from other institutions. Physical therapy majors begin classes in the spring. Upon receipt of the degree, a student must pass a state board examination in order to become licensed to practice.

Requirements for the Bachelor of Science Degree in Physical Therapy

1. Completion of the general university undergraduate degree requirements.
2. Completion of 136 credits, as set forth in paragraphs 3 and 4 below.
3. Completion of the health science core curriculum.
4. Completion of a major program consisting of: BIO 381, 405; HS 301; PE 304, 320; PT 322, 323, 324, 331, 341, 342, 343, 351, 425, 432, 444, 445, 446, 452, 453, and either 402/405, 404/405, 406/407, or 408/409.

PHYSICAL THERAPY COURSE OFFERINGS

PT 322 Physical Therapy and the Human Life Cycle (3)
Study of various aspects of the stages of life and the relationship to patient conditions commonly seen in physical therapy. Emphasis is on the developmental foundation for therapeutic techniques.

PT 323 Clinical Medicine and Physical Therapy (3)
Lecture series covering the etiology, signs and symptoms, course, treatment, and implications for physical therapy, of conditions managed by various medical specialties.

PT 324 Physical Therapist/Patient Milieu (3)
Survey of the various factors impinging upon the patient, the family, and ultimately the

patient-therapist relationship and what the therapist needs to consider when interacting with the patient or family.

PT 331 Evaluation Procedures (3)
Basic principles and techniques of manual muscle testing, goniometry, sensory and reflex testing, and neurodevelopmental assessment.

PT 341 Introduction to Physical Therapy (3)
Theory and practice of basic therapeutic techniques utilized in physical therapy. Includes medical emergencies, massage, mobility training, and basic communication skills.

PT 342 Therapeutic Procedures I (3)
Principles and use of superficial and deep heat, cold, infrared and ultraviolet radiation, hydrotherapy, and low voltage currents in therapeutic evaluation and treatment. Includes laboratory.

PT 343 Therapeutic Procedures II (3)
Theory and techniques of basic and traditional therapeutic exercises including general and localized strengthening, relaxation, mobility, coordination, and posture.

PT 351 Clinical Education I (1)
Orientation to clinical education including the practice of basic evaluation and treatment skills through supervised experience in the clinical environment.

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

PT 403 Specialized Physical Therapy Techniques (4)
Theory and techniques of advanced manual therapy.

PT 404 Specialized Physical Therapy Techniques Practicum (4)
A directed study dealing with the clinical application of selected physical therapy techniques.

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

PT 406 Physical Therapy and Advanced Pediatrics (4)
Advanced theory and principles of physical therapy care of pediatric patients.

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

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

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

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

PT 432 Research in Physical Therapy (2)
Theory and application of the principles of problem solving and the scientific method, with emphasis on current research in physical therapy, towards the completion of a small scale project.

PT 444 Therapeutic Procedures III (3)
Theory, principles, and application of neurophysiologic approaches to therapeutic exercise for specialized problems.

PT 445 Rehabilitation Procedures (3)
Therapeutic program planning for the severely handicapped patient for activities of daily living, recreation, home evaluation, family involvement and mobility. Includes principles and techniques regarding prosthetics and orthotics.

PT 446 Advanced Procedures (2)
A lecture and laboratory series of medical and surgical conditions seen by physical therapists, with emphasis on orthopedic, pulmonary, and athletic conditions.

PT 452 Clinical Education II (1)
Continuation of PT 351.

PT 453 Clinical Education III (2)
Continuation of PT 452.

CONCENTRATION IN HEALTH BEHAVIORAL SCIENCES

DIRECTOR: *Carl R. Vann*

PROFESSORS: *Philip Singer, Carl R. Vann*

Courses in health behavioral sciences are recommended as electives for students pursuing health careers in the programs offered by the Center for Health Sciences. The concentration in health behavioral sciences is planned to 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 also offers significant insights and opportunities for study to students pursuing programs of general education, administration, and law.

Requirements for the concentration in the health behavioral sciences are 20 credits to be chosen from: HBS 200, 250, 251, 300, 400, 499; AN 333, 420; ECN 467; PS 359; PA 568, 569.

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 their program in administration.

Students in the premedical program and majors in any of the natural sciences, with an adviser's approval, may count 4 credits of their major course work toward this concentration.

COURSE OFFERINGS

HBS 200 Health Care Dimensions (4)
Development, present status, and dynamics of the American health care system emphasizing structure of the various health professions and the problems, opportunities, and constraints of health care delivery, and professionalism. Other topics are relationships between the health care cultures and personality and professional roles of health care practitioners, and issues involving hospitals and health care.

HBS 250-251 Health Behavioral Sciences (4 each)
Human behavior, institutions, and professions in the health-medical fields. Emphasis on concepts of health and illness, death and dying, the sick role, doctor-patient relationships, organization and delivery of health care.

HBS 300 Independent Study in the Health Behavioral Sciences (4, 8, 12, or 16)
A semester of off-campus independent study and applied research. Projects are developed with and supervised by faculty within the framework of methodology and explanation in the behavioral sciences.

HBS 400 Field Practicum in Health Behavioral Sciences (4, 8, 12, or 16)
Primarily for students seeking careers in health-related fields, this course is a supervised field placement combined with academic content and individually guided research. Students are placed with hospitals, government and voluntary health agencies, comprehensive medical service organizations, etc.

HBS 499 Senior Seminar in Health Behavioral Sciences (4)

MEDICAL REVIEW PROGRAM

DIRECTOR: *Moon J. Pak (Health Sciences)*

ASSISTANT PROGRAM DIRECTOR: *Arthur J. Griggs (Health Sciences)*

CLINICAL ASSOCIATE PROFESSORS: *Michael Garcia, Nasirul Haque, Alexander Ullmann*

CLINICAL ASSISTANT PROFESSORS: *Jaime V. Aragones, Arnold L. Brown, E. Patrick Juras, Satish C. Khaneja, Moufid Mitri, Ahmad M. Samhouri*

The Medical Review Program is a graduate level, nondegree, short course for physicians preparing for examinations for medical licensure or graduate medical education opportunities. The examinations for which this program prepares physicians include the Educational Commission for Foreign Medical Graduates Examination (ECFMG) and the Federation Licensing Examination (FLEX). This program, which is strictly didactic in nature, is offered on an annual or biannual basis. The duration of the program is three months. During this time, approximately 350 hours of lecture are presented on the fundamentals underlying the basic and clinical science subjects associated with medical education programs in the United States. To be eligible for this program, applicants must be graduates, or senior year students, of medical education programs recognized by the World Health Organization.

THE DIVISION OF CONTINUING EDUCATION

OFFICE OF THE DEAN

Lowell R. Eklund, Dean

The division is responsible for university credit courses at extension sites and for noncredit course department programming, which includes cooperating with business and industry, governmental units, and other organizations to conduct university-level programs to meet their needs. The multifaceted programs of the division are designed to help individuals perform more effectively on the job and in their daily lives. Noncredit offerings are revised continuously to meet the expressed needs of nontraditional adult learners and of the community.

BACHELOR OF GENERAL STUDIES DEGREE (B.G.S.)

DIRECTOR OF GENERAL STUDIES: *Elaine Chapman-Moore*

B.G.S. COUNSELORS: *Marilyn Broderick, Carole Crum*

FACULTY COUNCIL FOR GENERAL STUDIES: *Hoda Abdel-Aty Zohdy, Assistant Professor, Engineering; Osmun Altan, Assistant Professor, Engineering; Jean Braun, Professor, Psychology; John Cowlishaw, Associate Professor, Biological Sciences; William Cramer, Associate Professor, Library; Leo Gerulaitis, Associate Professor, History; Barbara Hamilton, Special Instructor, Rhetoric; Gerald Heberle, Associate Professor, History; Patrick Johnson, Associate Professor, School of Human and Educational Services; Sandra Lowery, Assistant Professor, Nursing; Ann Pogany, Assistant Professor, Library; Luellen Ramey, Assistant Professor, Human and Educational Services; Howard Schwartz, Assistant Professor, School of Economics and Management; Richard Stamps, Associate Professor, Anthropology; Laura Stern, Instructor, Economics and Management; Carl Vann, Professor, Political Science/Behavioral Science.*

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 B.G.S. is primarily for students interested in obtaining a broad liberal arts education without majoring in a particular discipline. Students entering the B.G.S. program design a program of study utilizing courses from the university to prepare them for a particular job or career choice. B.G.S. degree students may select courses from any field of study offered by any academic department, subject to prerequisites and policies set by the individual departments. The B.G.S. program offers students the opportunity to plan a unique and challenging academic program in cooperation with a B.G.S. faculty adviser.

Some program enrollees have academic credits from other colleges and were encouraged by their employers to pursue a baccalaureate degree. The B.G.S. degree has flexible policies for the transfer of credits from other institutions, and it provides a personalized program to meet the educational needs of individuals and employers. Pre-enrollment counseling is available for those who wish to consider the B.G.S. degree.

Two-Plus-Two Program for Associate Degree Holders

The Bachelor of General Studies degree allows a student to combine broad liberal arts and professional courses with an associate's degree program from a Michigan community college. The two-plus-two program provides for transfer of up to 62 semester credits from accredited two-year institutions in Michigan. Courses accepted through the two-plus-two agreement must have been awarded a grade of C or above.

The B.G.S. degree program accepts all associate degrees as the first two years of the program, except for nursing associate degrees. Nursing associate degree recipients are subject to a course-by-course evaluation into the B.G.S. and other academic programs. Associate degree programs accepted under two-plus-two must include at least 12 semester credits of liberal arts courses, and contain all course work taken at accredited institutions.

Requirements for the Bachelor of General Studies Degree

Students eligible for the Bachelor of General Studies degree must:

1. Complete 124 credits.
2. Complete 32 of those credits at the 300 or 400 level.
3. Complete 32 credits at Oakland University and successfully complete the last 4 credits at Oakland University.
5. Demonstrate writing proficiency by meeting the university standards in English composition.
6. Successfully complete at least the last 24 credits as an admitted candidate to the B.G.S. program. Candidacy is authorized by the university and the Faculty Council for General Studies when the student has approval of his/her plan-of-work and rationale for the Bachelor of General Studies degree from the Bachelor of General Studies Advising Committee.
7. Have been admitted to candidacy for the B.G.S. degree by the university and the Faculty Council for General Studies.
8. Be in substantial agreement with legal curricular requirements of the state of Michigan.

Concentrations or Minors for B.G.S. Majors

Bachelor of General Studies students may wish to develop programs which include concentrations or minors offered by other academic schools or departments within the university. Approximately 50 minors or concentrations are available to B.G.S. students; a complete listing may be obtained from the general studies office. The student should consult the B.G.S. counselor for policies and procedures for seeking a minor or concentration.

Advising

Because the Bachelor of General Studies program is individualized by design, faculty advising is central to the program. Each B.G.S. student should follow a specific advising procedure, including:

1. Initial appointment with B.G.S. counselor. The counselor will explore with the student the appropriateness of the B.G.S. program to the student's needs and, if appropriate, assign a faculty adviser.
2. Assignment of faculty advisers. When a student elects a B.G.S. program through an admission application or a Change of Major Form, the counselor will give the student a list of faculty advisers and their special areas of interest. The student will either select a faculty adviser or will be assigned one.
3. Initial advising session. The prospective B.G.S. student and the faculty adviser will have an initial advising session to discuss the student's goals and courses

which may assist the student in achieving those goals. The student will complete a plan-of-work and write a rationale for the course selection.

4. Plan-of-Work and rationale. Within five weeks after the student sees the B.G.S. counselor, the plan-of-work and rationale are due in the general studies office.
5. Advising Committee Approval. When the faculty adviser approves the plan-of-work and rationale, these documents will be sent to the general studies office for approval by the B.G.S. advising committee which meets monthly to approve student programs.
6. Substitutions to plan-of-work. Courses taken other than those listed on the original plan-of-work must be approved by the student's faculty adviser on the Plan-of-Work Substitution Form. This form may be obtained from the general studies office or from the faculty adviser. When completed, the substitution form is submitted to the general studies office.

Conciliar Honors

Conciliar honors are granted to Bachelor of General Studies students by the B.G.S. faculty council. There are two ways in which a person gains conciliar honors:

1. If the student's cumulative grade point average is 3.60 or better, the student is automatically nominated for conciliar honors.
2. If the student's cumulative grade point average is between 3.30 and 3.59, the individual may self-nominate by submitting a letter of rationale. Application 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. The letter of self-nomination should be accompanied by faculty recommendations. Nominations will be considered by the advising committee and forwarded to the faculty council for final approval.

EXTENSION PROGRAM: UNDERGRADUATE

DIRECTOR OF COMMUNITY EDUCATION: *Harry B. Van Hook, Jr.*

The university offers undergraduate courses at various sites in southeast Michigan including: Shrine and Dondero High Schools, Royal Oak; Seaholm High School, Birmingham; Carleton Junior High School, Sterling Heights; Jewish Community Center, West Bloomfield; the Oakland County Service Center, Pontiac; and schools in Romeo and Clarkston.

Extension courses are also offered to business, government agencies, private agencies, and civic groups to provide special instruction to the clientele of such organizations. Most courses can be taught at the organization's facility, and the course content is structured to address specific needs or goals identified by the organization.

Nonmatriculating Admission

Potential evening students who have never attended Oakland University and were unable to secure regular admission to the university because of time may register for classes on a nonmatriculating basis at extension sites.

A nonmatriculating admission is valid for one semester only. An application fee is charged nonmatriculating students. During the first semester of nonmatriculation the student must secure regular admission to the university. To be considered for regular admission a student need only: submit a second application for admission to the director of admissions with the required application fee; forward transcripts from past colleges, universities, or high schools attended; and receive a letter of admission. Nonmatriculating students will receive full academic credit for courses in which they are enrolled.

POST-BACCALAUREATE ADMISSION

Potential evening students who presently hold a baccalaureate degree or higher (e.g., master's degree) and are unable to secure regular post-baccalaureate admission to the university because of time required for processing may register for undergraduate classes on a post-baccalaureate basis at extension sites.

For the post-baccalaureate status, students must complete the undergraduate admissions application and pay the application fee at the time of off-campus registration. A duplicated copy of a baccalaureate diploma or a duplicated copy of a transcript stating the degree must be presented at registration. Under post-baccalaureate status, students are admitted as special non-Oakland University degree candiates. Previous academic work is not evaluated by the registrar's office.

Extension Class Cancellation

The university reserves the right to cancel any extension course that does not have sufficient enrollment. All tuition and fees applicable to the canceled section are refunded automatically when a class is canceled.

ADDITIONAL LEARNING EXPERIENCES

The Division of Continuing Education course department offers primarily evening noncredit diploma programs and courses in professional, paraprofessional, and vocational subjects and provides important update for business, industry, and governmental units on campus or on site.

Diploma programs, a series of courses related to individual objectives, are offered in plastics technology and as preparation for becoming a legal assistant and an accounting assistant.

The Plastics Technology Diploma Program, co-sponsored with the Society of Plastics Engineers, is designed to update those in technically oriented positions and to provide basic knowledge for individuals who wish to enter the plastics industry.

The Legal Assistant Diploma Program, approved by the American Bar Association, is an 18-month evening program that trains paraprofessionals to perform law-related duties for attorneys in a variety of workplaces. Certain legal assistant courses have been approved for one hour of political science undergraduate credit each. Eight credits of these courses can be applied toward the political science major. For more information on the credit portion, see the political science listings or contact the legal assistant program director in the Division of Continuing Education.

The Accounting Assistant Diploma Program is a 12-month program developed in conjunction with business firms to instruct skills to paraprofessionals who provide vital support for accountants.

The CPA programs conducted on campus provide review for candidates planning to sit for the national examination. Qualifying hours for CPA annual relicensing are offered by special programs during the evening, on Saturdays, and on weekends periodically throughout the year. A review program for the Certified Internal Auditor examination also is conducted.

The course department also offers courses and workshops that provide technical update, e.g., statistical process (quality) control, hands-on computer courses, video production, as well as courses of current importance, such as personal financial planning and investment.

All programs and courses carry the nationally recognized Continuing Education Unit (CEU). Similar to credits which provide a means to carry degree work from one school to another, CEUs make it possible to document noncredit work and provide a means to build a permanent record of achievement valuable for evidence of increased capabilities and for job advancement. One CEU equals ten contact

hours of participation in an organized CE experience.

Test Preparation Workshops for the Scholastic Aptitude Tests (SAT), American College Testing (ACT), and Management Admissions Test (GMAT) are offered year-round as an assistance to college-bound high school students or persons who decide to enter a college program following an interruption of the traditional high school to college progression.

Conferences

Conferences on topical subjects are offered on a limited basis by the course department. Included among the offerings is the long-established writer's conference.

CABLE TV OFFICE

The Cable TV Office represents the university in the community and coordinates planning for the development of public service and instructional programming on area cable communications systems as they become operational. The office also is the coordinating and scheduling unit for the programming of the Educational Telecommunications Consortium (ETC), a group of primarily postsecondary educational institutions serving diverse audiences. Independent study and internship experiences for Oakland University students are available in this office. Students who wish to volunteer to help in the production of university programming for cablecast should contact the Cable TV Office.

LABOR EDUCATION SERVICE

The Labor Education Service provides daytime/evening courses for union members in both on- and off-campus locations and occasional residential conferences. A special leadership training program for union minorities and women, supported by a state grant, is open to the general public as well as union members.

UNIVERSITY FACULTY

This list reflects faculty appointments effective June 1, 1983, as they were available on the publication date.

Officers of Instruction

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James H. Graham, Manager, Operations
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Barbara A. Hallman, Programmer Analyst
Charlotte B. Hudack, Departmental Accountant
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Warner E. Lindell, Programmer Analyst
Mary Lou Matyjanowski, Senior Programmer Analyst
Diana L. Nagy, B.A., Senior Programmer Analyst
Shirley L. Thomas, Senior Programmer Analyst
Gail S. Trammel, Assistant Manager, Operations
Anthony Trojan, B.A., Senior Systems Analyst
William S. Watt, Senior Systems Programmer
Karen M. Wisniewski, Programmer Analyst
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Robert H. Bunger, J.D., Assistant General Counsel

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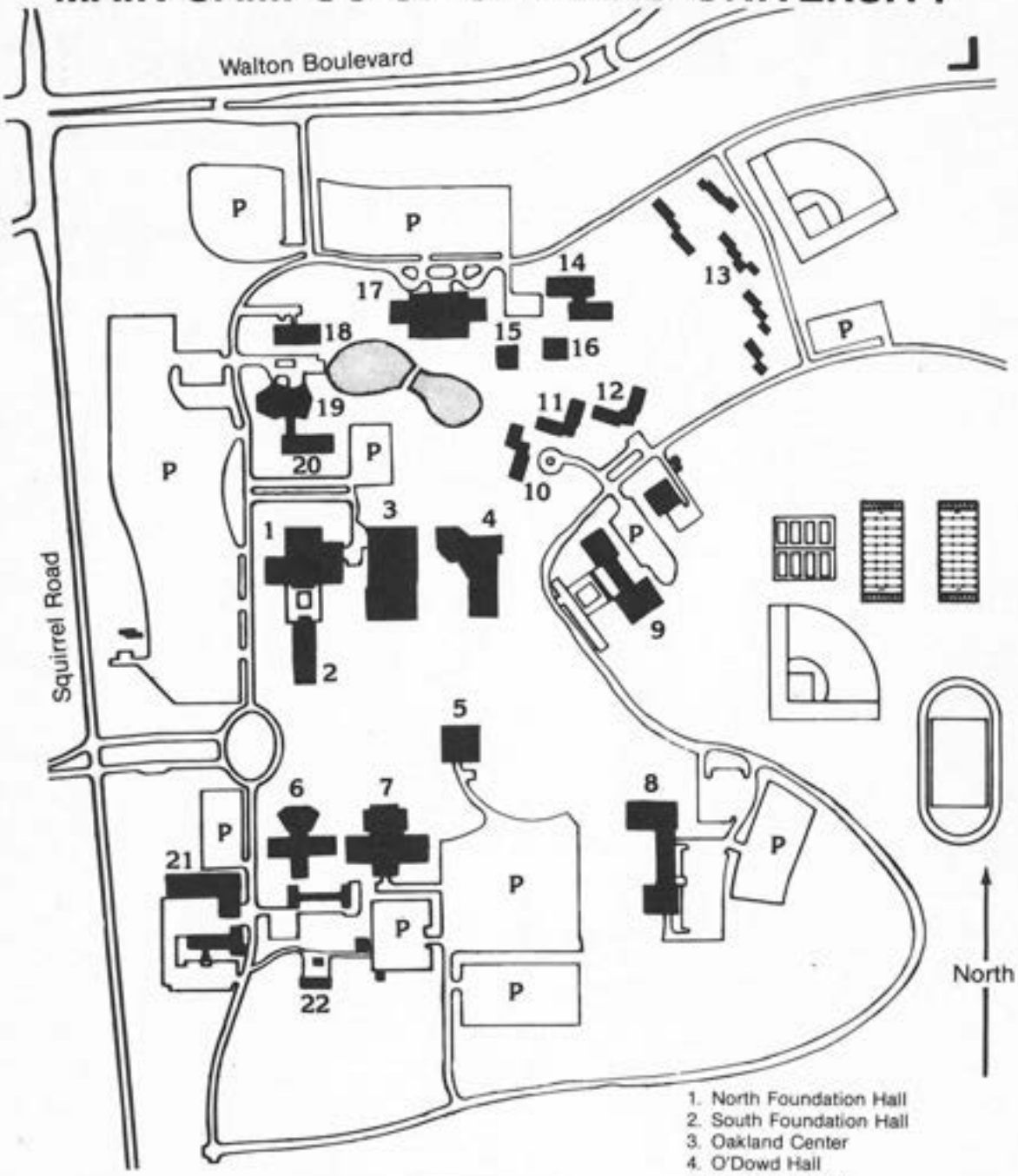

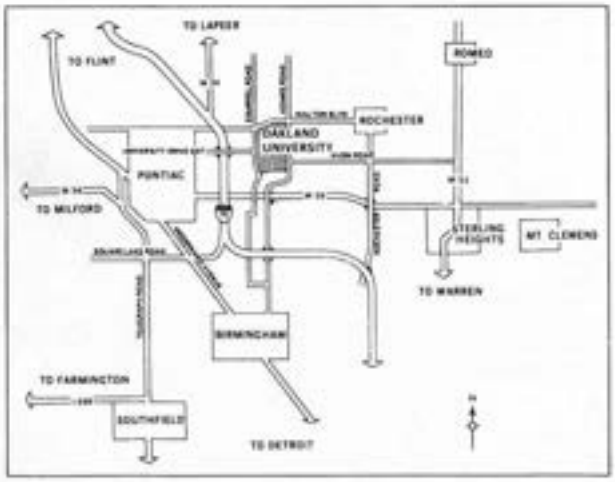

1. North Foundation Hall
2. South Foundation Hall
3. Oakland Center
4. O'Dowd Hall
5. Kresge Library
6. Hannah Hall of Science
7. Dodge Hall of Engineering
8. Varner Hall
9. Lepley Sports Building
10. Fitzgerald House
11. Anibal House
12. Pryale House
13. University Apartments
14. Hamlin Hall
15. Hill House
16. Van Wagoner House
17. Vandenberg Hall
18. Graham Health Center
19. Meadow Brook Theatre and Art Gallery
20. Wilson Hall
21. Public Safety and Services Building
22. Barn Theatre

Rochester, Michigan