



OAKLAND UNIVERSITY
GENERAL INFORMATION BULLETIN
1973 GRADUATE STUDY 1974
ROCHESTER MICHIGAN

CORRESPONDENCE DIRECTORY

Mailing address: Oakland University, Rochester, Michigan 48063.
Officers of the University will be pleased to answer questions. For prompt attention address specific inquiries to the officers listed below.

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**OAKLAND
UNIVERSITY**

**GRADUATE STUDY
GENERAL INFORMATION
BULLETIN
1973-1974**

Rochester, Michigan

UNIVERSITY CALENDAR

1972-1973

Fall Semester, 1972

August 28, 29	Monday, Tuesday	Orientation
August 30- September 1	Wednesday-Friday	Registration
September 5	Tuesday	Classes begin
November 23-26	Thursday-Sunday	Thanksgiving recess
November 27	Monday	Classes resume
December 15	Friday	Classes end
December 18-22	Monday-Friday	Final examinations

Winter Semester, 1973

January 2	Tuesday	Orientation
January 3-5	Wednesday-Friday	Registration
January 8	Monday	Classes begin
March 1-4	Thursday-Sunday	Winter recess
March 5	Monday	Classes resume
April 20	Friday	Classes end
April 23-27	Monday-Friday	Final examinations

Spring Session, 1973

April 30	Monday	Registration
May 1	Tuesday	Classes begin
May 28	Monday	Holiday
June 2*	Saturday	Commencement
June 20	Wednesday	Classes end
June 21, 22	Thursday, Friday	Final examinations

Summer Session, 1973

June 25	Monday	Registration
June 26	Tuesday	Classes begin
July 4	Wednesday	Holiday
August 15	Wednesday	Classes end
August 16, 17	Thursday, Friday	Final examinations

This calendar is subject to revision.

*All students who have received or expect to receive their degrees during this academic year participate in this Commencement ceremony.

Oakland University affirms that an Assurance of Compliance with Title VI of the Civil Rights Act of 1964 has been executed and is fully applicable to the policies and practices of this University. Specifically, admission to the University or employment by the University is provided to qualified persons without discrimination on the grounds of race, creed, color, sex, or national origin.

All announcements in this bulletin are subject to revision at the discretion of the University.

January, 1973

Volume 3, No. 1

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UNIVERSITY CALENDAR

1973-1974

Fall Semester, 1973

August 29, 30, 31	Wednesday-Friday	Registration
September 4	Tuesday	Classes begin
November 22-25	Thursday-Sunday	Thanksgiving recess
November 26	Monday	Classes resume
December 12	Wednesday	Classes end
December 13, 14, 17-19	Thursday, Friday, Monday-Wednesday	Final examinations

Winter Semester, 1974

December 3-19		Pre-registration
January 3, 4	Thursday, Friday	Registration
January 7	Monday	Classes begin
March 9-12	Saturday-Tuesday	Winter recess
March 13	Wednesday	Classes resume
April 16	Tuesday	Classes end
April 17-19, 22, 23	Wednesday-Friday, Monday, Tuesday	Final examinations

Spring Session, 1974

April 8-23		Pre-registration
April 26	Friday	Registration
April 29	Monday	Classes begin
May 27	Monday	Memorial Day
June 2*	Sunday	Commencement
June 18	Tuesday	Classes end
June 19	Wednesday	Free day
June 20, 21	Thursday, Friday	Final examinations

Summer Session, 1974

June 17-21		Pre-registration
June 24	Monday	Registration
June 25	Tuesday	Classes begin
July 4	Thursday	Holiday
July 5	Friday	Classes resume
August 14	Wednesday	Classes end
August 15, 16	Thursday, Friday	Final examinations

This calendar is subject to revision.

*All students who have received or expect to receive their degrees during this academic year participate in this Commencement ceremony.

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BOARD OF TRUSTEES

Oakland University is governed by an eight-member Board of Trustees appointed by the Governor. Legislation creating Oakland University as an independent institution, separate from Michigan State University, was established under Act No. 35, Public Acts of 1970. The President of the University is appointed by the Board and is the presiding officer of that body. The Board also appoints a secretary and treasurer. The following are the Board members and officers:

Mr. Leland W. Carr, Jr.	Term expires August 11, 1978.
Mr. Marvin L. Katke	Term expires August 11, 1978.
Mrs. Roger M. Kyes (Helen G.)	Term expires August 11, 1974.
Mr. David B. Lewis	Term expires August 11, 1980.
Mr. Ken Morris	Term expires August 11, 1974.
Mr. Arthur W. Saltzman, Vice Chairman	Term expires August 11, 1976.
Mr. Alan E. Schwartz	Term expires August 11, 1980.
Mr. Otis M. Smith, Chairman	Term expires August 11, 1976.
Donald D. O'Dowd, President	
John H. De Carlo, Secretary	
Robert W. Swanson, Treasurer	

ADMINISTRATION

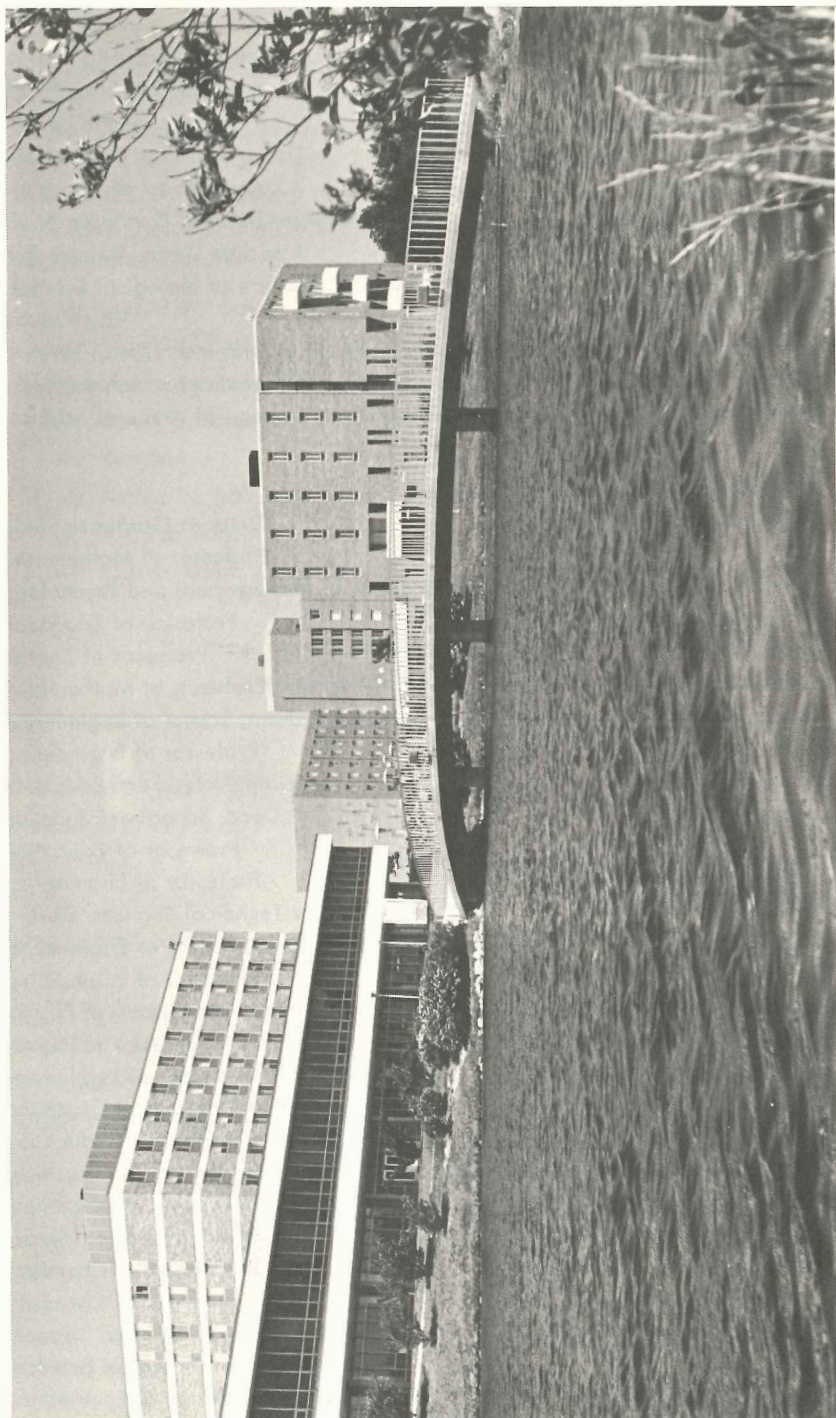
Donald D. O'Dowd	President
Glen Brown	Assistant President for Campus Development
William W. Connellan	Assistant to the President
John H. De Carlo	Secretary to the Board of Trustees and Vice President for Public Affairs
Lowell R. Eklund	Dean of Continuing Education
Frederick W. Obear	Vice President for Academic Affairs and Provost
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George L. Gardiner	Dean of the Library
John E. Gibson	Dean, School of Engineering
Laszlo J. Hetenyi	Dean, School of Education
William H. Jones, Jr.	Assistant Dean of Graduate Study
Terence Kilburn	Associate Dean, Theatre Arts
V. Everett Kinsey	Director, Institute of Biological Sciences
George T. Matthews	Vice Provost
Lewis N. Pino	Director of Research and Institutional Services
Norton C. Seeber	Dean, School of Economics and Management
Reuben Torch	Acting Dean, College of Arts and Sciences

GRADUATE COUNCIL

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	Professor of Mathematics
Daniel N. Braunstein	Associate Professor of Management and Psychology
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	Professor of Engineering
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	Professor of Education
Joseph Der Hovanesian	Professor of Engineering
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Keith R. Kleckner	Assistant Dean, School of Engineering
	Professor of Engineering
Abraham Liboff	Chairman, Department of Physics
	Professor of Physics
David G. Lowy	Associate Professor of Psychology
Roderick E. Righter	Associate Professor of Education
Virginia M. Schuldenberg	Assistant Professor of Education
Norton C. Seeber	Dean, School of Economics and Management
	Professor of Economics and Management
Norman Tepley	Associate Professor of Physics
Paul Tomboulion	Chairman, Department of Chemistry
	Professor of Chemistry
Reuben Torch	Acting Dean, College of Arts and Sciences
	Professor of Biological Sciences
Gilbert L. Wedekind	Associate Professor of Engineering



OAKLAND UNIVERSITY

ACADEMIC STRUCTURE

Oakland University, an institution supported by the State of Michigan, offers programs in liberal arts and sciences and professional training in economics and management, engineering, teacher education, and the performing arts. The University comprises the College of Arts and Sciences, the School of Economics and Management, the School of Education, the School of Engineering, the School of Performing Arts, and the Faculty of the Library. Diversified non-credit courses are given by the Division of Continuing Education.

GRADUATE PROGRAMS

The College of Arts and Sciences offers programs leading to the degree of Master of Arts in English, mathematics, and psychology and to the degree of Master of Science in chemistry and physics. The School of Education offers programs of instruction leading to the degree of Master of Arts in Teaching in elementary education, in reading instruction, and in special education (for emotionally disturbed children). The College of Arts and Sciences and the School of Education jointly offer programs leading to the degree of Master of Arts in Teaching in English and in mathematics. The School of Engineering offers a Ph.D. in systems engineering and the degree of Master of Science in engineering, with concentrations in systems engineering, energy engineering, and electromagnetic and optical engineering.

ACCREDITATION AND AFFILIATIONS

All Oakland University baccalaureate and master's degree programs are fully accredited by the North Central Association of Colleges and Secondary Schools, and the University is authorized to begin new programs at these levels without prior Association approval. The doctoral program in engineering is also accredited by the North Central Association. The American Chemical Society has accredited the undergraduate program of the Department of Chemistry, and the Engineers' Council for Professional Development has accredited the undergraduate program of the School of Engineering.

The University is an institutional member of the following associations:
 The American Association of Colleges for Teacher Education
 The American Council on Education
 Institute of International Education, Incorporated
 Latin American Scholarship Program of American Universities

The appropriate departments of the College of Arts and Sciences are institutional members of the following associations:

American Chemical Society
American Institute of Physics
American Mathematical Society
Midwest Art Association
Sigma Xi

CENTRALIZED AND SPECIALIZED RESEARCH FACILITIES

THE COMPUTING AND DATA PROCESSING CENTER

The Computing and Data Processing Center is a centralized facility that supports research programs and projects at Oakland University by supplying equipment, documentation, and consulting personnel for the computative, simulative, pedagogical, and instrument-control applications of the faculty and students of all disciplines. It provides a conducive computer-oriented environment in which students can explore and complete investigative, communicative, and computative assignments and in which faculty may draw on advisory and demonstration services for their courses of instruction. The Center is located on the second floor of Dodge Hall of Engineering in especially designed quarters having full software facilities for faculty and students. It operates an IBM 360/40 computer with peripheral equipment including high-speed printer, tape drives, and disc memory units.

THE DEPARTMENT OF BIOLOGICAL SCIENCES LABORATORIES

In the Dodge Hall of Engineering the Department of Biological Sciences has over 14,000 net square feet of facilities constructed largely with the aid of a matching-funds grant from the National Institutes of Health. These facilities are expressly designed to stimulate and support the planned involvement of qualified undergraduates in faculty research programs as well as in student research projects. The facilities will also be supportive of research at the graduate level as graduate programs are added to the curriculum. Major fields of research strength at present are: cell biology, molecular biology, biochemistry, genetics, developmental biology, and physiology.

These facilities include six teaching laboratories, twelve research laboratories, a large common laboratory for advanced student research, cold rooms, an incubation room, a sterile room, an electron microscopy laboratory, three dark rooms, a radioactive isotope room, preparation and store rooms, an instrument shop, animal quarters, and marine aquaria. Both in functional

design and specialized equipment these facilities constitute a major research resource of the University.

INSTITUTE OF BIOLOGICAL SCIENCES

The Institute of Biological Sciences of Oakland University occupies some 6,500 net square feet of laboratory and office space contiguous to, but separate from, the facilities of the Department of Biological Sciences. These facilities, too, were constructed with the aid of a matching-funds grant from the National Institutes of Health. The facilities of the Institute include six main research units, each with an office for the principal investigator, and central facilities consisting of a cold room, a computer facility, a radioactive isotope laboratory, an animal holding room, an animal surgery, an instrument room for major pieces of apparatus, and a conference room.

In this modern and well-equipped center a group of research scientists perform grant-supported basic research having applications to medicine and centering in living systems. The aim of the Institute is to bring together many disciplines to concentrate on biological problems. A broadly interdisciplinary program of research in molecular biology, biochemistry, physiology, and pharmacology draws on the combined insights of specialists in engineering, chemistry, physics, and mathematics. Current research is related to eye neurology, eye chemistry, and ophthalmology.

THE INSTRUCTIONAL MATERIALS CENTER

The Instructional Materials Center is a teaching and resource agency of the School of Education. The Center contains a variety of printed materials, such as pamphlets, curriculum guides, and manuals, for research and instructional purposes. Multi-media instructional devices are also concentrated here. In addition to the simpler equipment, such as film strips, tape, and overhead projectors, the Center has facilities to produce and make available for use video tapes and educational television materials. Students have the opportunity to acquaint themselves with new developments in instructional techniques, and educational researchers have at their disposal the technological and recording facilities needed for their investigations.

THE KETTERING MAGNETICS LABORATORY

The Kettering Magnetics Laboratory, built with money given by the Kettering Foundation, constitutes another important research facility. This building is constructed of non-ferrous material and is particularly suited for research requiring accurate cancellation of the earth's magnetic field. The laboratory is used for very accurate measurements of gyromagnetic ratios of ferrous materials (the Einstein-de Haas effect). This work is done in an area in which the ambient magnetic field is reduced to less than one gamma by

large Helmholtz coils. Research is also in progress on a new gas torque effect which appears to be capable of giving information about the rotational gyromagnetic ratios of gas molecules and about collision cross sections of molecules.

THE LIBRARY

Oakland University's library collections are housed in Kresge Library and in a small Performing Arts Library (in Varner Hall) which contains a specialized collection of materials on the performance of music, theatre, and the dance. The collections of the University Libraries now contain approximately 221,000 volumes, 152,000 units of microform, and 6,000 recordings on disc or tape—all in open stacks. The Matilda R. Wilson Memorial Collection of works of reference, amassed through gifts of money from the University's students, constitutes a large part of the collections and provides a substantial research facility. Other remarkable special collections include one of the largest collections in the Midwest of underground newspapers, and the Hicks Collection of books by and about women.

The Library offers many services to its users: audio centers in both Kresge and the Performing Arts Library; a microform reading room; a Documents Department, which houses United States and United Nations publications and is a partial depository for the official documents of the United States and of the State of Michigan; a science area in which are concentrated the monographs, indexes, periodicals, and abstracts that pertain to this broad subject field; a General Reference Department; a Circulation Department with a computerized check-out system; and a Serials Department in charge of about 25,000 periodical volumes as well as other serials.

THE LEARNING STRATEGY CENTER

The Learning Strategy Center is an agency in the School of Education, financed through cooperative ventures with neighboring school districts. The Center produces experimental devices in a variety of areas and develops teaching units for demonstration and model purposes. Scholars and experimentalists from across the nation have participated in preparing special units of instruction, and these units have been made available to cooperating school districts for field trials. Similarly, gifted teachers in cooperating schools have prepared video tapes and other materials demonstrating successful approaches to specific teaching problems. These materials are also disseminated by the Learning Strategy Center.

OFFICE OF INSTITUTIONAL RESEARCH

The Office of Institutional Research concerns itself with research on students. It maintains research-oriented files of student information and

carries out analyses of this data to aid the University in planning and in program development. It also assists faculty and students in organizing, systematizing, and carrying out research regarding student behavior and learning. In addition, its staff is available for consultation on problems in social research wherever appropriate.

UNIVERSITY INSTRUMENT AND ELECTRONICS SHOPS

The University maintains several machine shops to serve the academic community. The Student Shop has a basic complement of machine tools for the use of students who wish to construct devices for their research projects. The Instrument Shop is completely equipped with precision machine tools and manned by skilled machinists and instrument makers. It constructs devices for both faculty and student research projects. A faculty committee works with the University Instrument and Electronics Shops Manager to insure an equitable allocation of resources.

UNIVERSITY READING CENTER

The University Reading Center is primarily a service agency of the School of Education through which undergraduates may receive assistance in improving their reading and study skills. The Center is not merely a clinical facility for remedial purposes, but also is designed to assist already skillful students in improving themselves further. The Reading Center also functions as a laboratory for research and training in the field of reading improvement.

OTHER RESEARCH FACILITIES DESCRIBED IN THIS BULLETIN

Further data on the research facilities and activities of the departments and schools offering graduate programs may be found in the sections of this bulletin related to the Department of Chemistry, the Department of Physics, and the School of Engineering.

3 or 4 students
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COLLEGE OF ARTS AND SCIENCES

DEPARTMENT OF CHEMISTRY

THE MASTER OF SCIENCE IN CHEMISTRY

The master of science in chemistry can be viewed as either a terminal or an intermediate degree. By itself it serves as preparation for employment in chemical and related industries, a wide range of government agencies, and secondary school or two-year college teaching. It also prepares the student for further study towards advanced degrees in chemistry, oceanography, environmental sciences, and related fields. The program is designed especially for full-time students, but provision is made for part-time students who wish to pursue an advanced degree during the daytime. All graduate students must receive approval of the departmental graduate program adviser before enrolling in courses.

Admission to Course

An applicant for admission to the Master of Science program should have received a bachelor's degree within the past five years from an accredited institution. Students should have completed not fewer than 36 credits in chemistry (including all major areas), 12 credits in mathematics (calculus and above), and 8 credits in physics. Students with deficiencies in these areas may be asked to correct these deficiencies, and their graduation may thus be delayed. A grade point average of at least 2.75 (on a 4.0 scale) in these courses is usually required, but applicants will be considered on their individual merits upon recommendation of persons familiar with the applicant's academic background. The Graduate Record Examination may be required, especially if the applicant does not hold an American degree.

Any of the above requirements may be waived by the Department. By petition to the Department, a maximum of 10 credits of graduate work may be transferred from another institution.

Requirements for the Degree

The candidate for the degree of Master of Science in chemistry ordinarily must complete the following minimum requirements: 32 credits in courses carrying graduate credit, of which 26 credits must be in chemistry. Of these 26 credits, 16 must be from four of the following areas: biochemistry, inorganic chemistry, organic chemistry, physical chemistry, environmental, and analytical chemistry. (Permission of the graduate program adviser is required if 300-level courses are to be used.) Of the remaining 10 credits in chemistry, a minimum of 8 credits must be in CHM 690. The candidate must have demon-

strated accomplishment in research and must have a thesis approved by a departmental committee prior to receiving the degree. Since the degree is awarded for the attainment of a level of proficiency and maturity, no minimum amount of time can be specified for the degree program.

RESEARCH FIELDS AND FACILITIES

Because graduate work in chemistry involves research and presentation of a master's thesis, the programs, facilities, and staff available are important. The various current research activities of the staff include: organolithium condensation reactions, high-resolution infrared spectroscopy, photochemistry of natural products, insect biochemistry, stereochemistry of crowded aromatic systems, kinetics of azine pyrolyses, chromatographic separations of diastereomers, electron spin resonance of solid-state and biological systems, microwave spectroscopy, quantum mechanical models, organoboranes, ionic aromatic polymers, atmospheric chemistry, gas reaction kinetics, molecular structure and dynamics, Fourier spectroscopy, psychochemistry, gas chromatographic pollutant analysis, limnological chemistry, instrumentation design, theoretical quantum mechanics, non-equilibrium statistical mechanics, lanthanide shift reagents, organophosphorus chemistry, coordination chemistry, kinetics and thermodynamics of rearrangement processes in solution, electrochemistry, relaxation techniques for slow proton transfers.

Among research facilities available to chemistry students are: electronic computers, high- and low-resolution infrared spectrophotometers, analytical and preparative gas-liquid chromatographs including fraction collectors, catalytic hydrogenation equipment, nuclear magnetic resonance spectrometer, radio-chemical counting equipment, low-energy beta-ray counter, polarographic and automatic titration equipment, electron spin resonance spectrometer, spinning-band fractionating columns, a variety of high- and low-resolution visible and ultraviolet spectrophotometers, high-resolution far-infrared interferometer, ultracentrifuge, fluorometric and nephelometric equipment, and a large amount of electronic and vacuum instrumentation. Nearby facilities include two digital computers, electron microscope, helium leak detector, and liquid scintillation counters.

COURSE OFFERINGS

(One credit hour is equal to one semester hour.)

Selected 300-Level Courses Which May Carry Graduate Credit

CHM 312	Inorganic Chemistry	(4 credits)
CHM 317	Inorganic Chemistry Laboratory	(1 credit)
CHM 324	Analytical Chemistry	(2 credits)

- CHM 328 Analytical Chemistry Laboratory (2 credits)**
- CHM 345 Physical Chemistry (4 credits)**
- CHM 348 Physical Chemistry Laboratory (2 credits)**
- CHM 351 Biochemistry (4 credits)**
- CHM 357 Biochemistry Laboratory (1 credit)**
- CHM 371 Environmental Chemistry (3 credits)**
- CHM 400 Seminar (1 credit)**
Weekly discussions of all fields of current interest in chemistry. (This course may be taken twice for credit.)
- CHM 405 Selected Topics (2, 4 or 6 credits)**
Advanced study in special areas; seminars, laboratory work, and readings.
Prerequisite: Permission of the department.
- CHM 413 Advanced Inorganic Chemistry (4 credits)**
A study of the families of elements and classes of compounds from the standpoint of molecular structure and the rates and equilibria involved in chemical reactions. Prerequisite: CHM 312.
- CHM 422 Advanced Analytical Chemistry (4 credits)**
Detailed treatment of the theory and applications of modern analytical methods. Prerequisite: CHM 324.
- CHM 426 Instrumentation (3 credits)**
Analysis of design and operation of instrumental equipment; includes laboratory. Prerequisite: CHM 238, 328, 348; PHY 158.
- CHM 434 Advanced Organic Chemistry (4 credits)**
Discussion of the various aspects of modern synthetic methods, stereochemistry, and reaction mechanisms; selected special topics.
Prerequisite: CHM 204 or 235.
- CHM 444 Advanced Physical Chemistry (4 credits)**
Application of quantum mechanics and statistical mechanics to chemical kinetics, molecular structure, and molecular spectroscopy.
Prerequisite: CHM 345.
- CHM 448 Spectroscopy Laboratory (2 credits)**
Experimental techniques of spectroscopy; infrared, ultraviolet, nuclear magnetic resonance, electron spin resonance, mass spectroscopy.
Prerequisite or corequisite: CHM 444.

- CHM 452 Advanced Biochemistry (4 credits)**
Topics in intermediary metabolism, cellular regulation, and molecular genetics.
Prerequisite: CHM 351 or BIO 407.

- CHM 487 Advanced Preparations (2 or 4 credits)**
Specialized laboratory work in selected areas emphasizing advanced techniques.
Prerequisite: Permission of the instructor is required prior to registration.

- CHM 490 Research (1, 2, 4, 6, or 8 credits)**
Laboratory and library practice in undergraduate research.
Prerequisite: Permission of the department is required prior to registration.

- CHM 497 Apprentice College Teaching (2 or 4 credits)**
Supervised participation in the teaching of selected undergraduate courses, usually laboratories. Open to upperclass majors. May not be used to satisfy major requirements (Graded S/N).
Prerequisite: Permission of the department.

Chemistry courses on the 500 level are graduate level courses available to well-prepared undergraduate students with permission of the department. These courses may be offered as reading courses on a tutorial basis or as small lecture courses.

- CHM 512, 513 Topics in Inorganic Chemistry (4 credits each)**
Advanced treatment of selected topics of inorganic chemistry.
Prerequisite: CHM 413 or equivalent.

- CHM 523, 524 Topics in Analytical Chemistry (4 credits each)**
Advanced treatment of selected topics of current analytical chemistry such as separation methods, instrumentation, electrochemistry.
Prerequisite: CHM 422 or equivalent.

- CHM 531, 532, 533 Topics in Organic Chemistry (4 credits each)**
Advanced treatment of selected special topics: natural products, organometallics, reaction mechanisms, synthesis.
Prerequisite: CHM 434 or equivalent.

- CHM 543, 544 Topics in Physical Chemistry (4 credits each)**
Special topics in physical chemistry such as quantum mechanics, statistical mechanics and thermodynamics, kinetics, group theory.
Prerequisite: CHM 444 or equivalent.

- CHM 552, 553 Topics in Biochemistry (4 credits each)**
Advanced treatment of selected topics in biochemistry. This course is usually conducted as tutorial with topics chosen according to the interests and backgrounds of the students.
Prerequisite: CHM 452 or equivalent.

DEPARTMENT OF ENGLISH

The Department of English offers programs leading to the degrees of Master of Arts in English and Master of Arts in Teaching in English. The latter program is jointly sponsored by the College of Arts and Sciences and the School of Education.

ADMISSION TO COURSE

Admission to course in either of the Department's advanced degree programs is selective. Chief qualifications are the degree of Bachelor of Arts from an accredited institution, academic ability as indicated by past record, capacity to meet standards of advanced scholarship as estimated by informed referees (e.g., undergraduate professors), and interest in continued study of letters. An English major, as such, is not regarded as indispensable background, but a substantial number of undergraduate English courses will normally be expected to appear in the applicant's record. Evidence of additional reading in the literature of history, philosophy, and theology is welcome; prior study in linguistics and philology is also recommended.

Undergraduate course work in language and literature should show a grade point average of no less than 3.0 (on a 4.0 scale). Superior performance in these areas during the latter part of a student's undergraduate career, together with strong letters of recommendation, may in the Department's judgment counterpoise a cumulative GPA in all courses as low as 2.75. An applicant expecting consideration for admission must, however, have a cumulative GPA no lower than 2.75.

When students of specially recommended ability, but with insufficient background—in extent or balance of previous studies—are admitted, they will be advised concerning improvement of their preparation and will usually be asked to take an appropriate number of departmental undergraduate courses before commencing graduate work. Their degree programs, accordingly, may require a proportionately longer period to complete.

Students in either the M.A. or M.A.T. program whose undergraduate record shows no course in English language or linguistics will be asked to include one such course among their graduate undertakings.

Applications for admission will be reviewed November 15, March 15, and July 15 by the Graduate Committee of the Department of English. Candidates are advised to have all documentary support in the Office of Graduate Study well in advance of the review board's dates.

THE MASTER OF ARTS IN ENGLISH

The program leading to the degree of Master of Arts in English has been designed to provide training for students interested in increasing their proficiency in the study of English and American language and literature.

The basic curriculum is rather prescriptive, directing the student's attention not so much to literary materials or specialization in an historical period, but to major critical approaches. Opportunity is offered for scholarly, pedagogical and creative application of basic approaches to literature and language. The program is of use to those whose eventual goal is the Ph.D. degree, but it is primarily directed to the needs of teachers of English in advanced high school classes and to those preparing for teaching in junior and community colleges.

Requirements for the Degree

Nine courses (36 credits) are required, two of which must be 600-level courses in English. The seven additional courses are to be chosen in consultation with the student's program adviser. Within the 36 credits required for the degree, a student may be permitted to take one course in a cognate liberal arts field, or ENG 510 in lieu of a cognate, but only with specific approval of the adviser. Candidates for the degree will be expected to show competence in the reading of a second language (ancient or modern) by examination early in the program. Language competency examinations will normally be given in mid-November and mid-March. Students will not be allowed to continue course work beyond 16 credits until they have satisfied the language requirement. (See also the Master of Arts with English language concentration below.)

THE MASTER OF ARTS WITH ENGLISH LANGUAGE CONCENTRATION

The program leading to the degree of Master of Arts with English language concentration is not a separate degree program but a concentration within the existing Master of Arts in English program. The Master of Arts with English language concentration is provided for those students who wish to study linguistic theory, and the structure and history of the English language on the graduate level.

Admission to Course

Any students duly admitted into the M.A. program may, in consultation with their advisers, arrange a program with English language concentration. The only added prerequisite for this program is any one of the following three courses: ENG 376, History of the English Language; ENG 377, Modern

English Grammar; or ENG 382, Old English. The equivalent of any one of these will also be accepted.

Requirements for the Degree

Nine courses (36 credits) are required, six of which are specified in the normal program: the two undergraduate courses from the above list (ENG 376, 377, 382) which were not taken as prerequisites; ENG 534, Language History; ENG 642, Studies in Old and Middle English Literature; ENG 647, Studies in the Structure of English; and ENG 690, The Master's Project. The other three courses will be elected from graduate offerings in English literature. The standard program may be modified for an individual student depending on his background and interests. The language requirement for the Master of Arts in English is also applicable to this concentration.

THE MASTER OF ARTS IN TEACHING IN ENGLISH

The program leading to the degree of Master of Arts in Teaching in English is designed more particularly for students who wish to pursue graduate study to improve their competence as teachers of English and American literature and language. It is sponsored jointly by the College of Arts and Sciences and the School of Education.

Requirements for the Degree

Nine courses (36 credits) are required, five of which are specified: ENG 510, two 600-level courses in English; one course chosen from the following group of four alternates: ED 601, ED 602, ED 603, or ED 604; and one course from the following group of two: PSY 510 or PSY 512. The remaining four courses in English are to be chosen in consultation with the student's program adviser.

CLASSIFICATION OF COURSE OFFERINGS

The graduate program of the Department of English offers four kinds of courses:

(1) Undergraduate Courses (300 level)

The student may take a maximum of two undergraduate courses to be chosen from regular departmental 300-level offerings. Such courses are deemed useful principally in preparing students to take seminars in areas of language and literature for which they are not yet adequately trained. No more than five graduate students may enroll in any 300-level course. Enrollment for all undergraduate courses is subject to the approval in writing of the student's adviser.

(2) Core Courses (500 level)

Core courses are designed to familiarize the student with principal approaches to language and literature and with methods and tools appropriate to those approaches. The Department considers these courses to be central to the graduate program and recommends that the student take at least three of them. They should be considered as helpful aids in coping with the more specialized work of the seminars. Each of these courses will be offered at least once during the year. (ENG 500 and 510, as noted below in the list of course offerings, are specialized courses, not core courses.)

(3) Seminars and the Master's Project (600 level)

(a) Seminars

The purpose of the graduate seminar is to allow the student to do independent work in an area in which the instructor has special sophistication, at the same time to gain criticism and support from other students working in the same area. Classes will consist mainly of the reading and discussion of papers prepared by the students on topics specified by the instructor. The instructor will prescribe the particular subject matter of each course during any given term. First-term students may not enroll in a seminar without permission of the Department Committee on Graduate Programs. Seminars are limited to twelve students.

(b) ENG 690 The Master's Project

ENG 690 involves completion of a modest project of creative, scholarly, or pedagogical nature, proposed initially by the candidate. Any written work to be submitted in partial or total fulfillment of a project should not exceed 7,500 words. Projects normally arise out of graduate course work, and candidates are advised to register for English 690 at any time after the completion of 12 credits. The course is open only to students who can propose an independent project and have made arrangements with a member of the department interested in supervising it. An application form for ENG 690 is available in the department office. It must be used by the student in submitting a conspectus of the project and seeking approval to proceed.

(c) To graduate a student must deposit evidence of scholarly or pedagogical maturity (a project or a seminar paper) in prescribed form with the Department of English.

(4) Summer Institutes

Concentrated four-week institutes in Shakespeare, linguistics, and other topics of interest to high school teachers and post-baccalaureate students are offered in summer session. They are designed as refresher courses or as introductions to topics of particular contemporary concern. Institutes grant four

hours of graduate credit and are usually graded S/N. Students may not offer more than four hours of work in Institutes toward fulfillment of requirements for advanced degrees except by permission of the Graduate Committee of the department. Candidates for degrees must consult with their advisers before electing Summer Institutes.

Cognate Courses (M.A. Program)

Students in the M.A. program may, with the written approval of their program advisers, offer one course from another department of this University for credit toward their degrees. Such a course should be advanced work in a field relevant to the student's special interests in English language or literature.

COURSE OFFERINGS

(One credit hour is equal to one semester hour.)

ENG 500 Advanced Topics in Literature and Language (4 credits)
Special topics and problems as selected by the instructor. Not a core course.

ENG 510 Literature and Composition (4 credits)
Form and style in prose and poetry. Exploration of relationships among the study of literature, the study of language, and composition. Experience in writing and criticism of writing. Designed for the teacher of English language and literature. Required of M.A.T. candidates. Not a core course.

ENG 515 Shakespeare Institute (4 credits)
An intensive four-week consideration of Shakespeare's theatre and selected plays directed to the needs of secondary school teachers. Lectures, discussions, workshops, and trips to Stratford Productions.

ENG 533 Formal Analysis (4 credits)
An intensive study of approaches to specific works of literature in and of themselves and an examination of techniques appropriate to those approaches.

ENG 534 Language History (4 credits)
An intensive study of the development of standard English through an examination of texts that are representative of Early Modern English, Middle English, and Old English.

ENG 541, 542, 543 Literary History (4 credits)
Work in a different literary period each semester with emphasis on concepts, approaches and methodology appropriate to the literary historian. Literature in historical perspective and in cultural and social contexts. Either semester may be elected independently.

ENG 561, 562, 563 Literary Kinds (4 credits)
Study in each semester of a single genre (such as novel, lyric, or drama) or mode (tragedy, comedy, pastoral). Consideration of similarities and differences among individual works, and of the relationship of the kind under discussion to the body of literature as a whole. Either semester may be elected independently.

ENG 597 Apprentice College Teaching (4 credits)
An introduction to teaching English at the college level. Internship with assigned professor in a course offered at Oakland or a cooperating community college. To be arranged in the semester preceding that in which the course is taken. By permission only.

ENG 600 Studies in Language and Literature (4 credits)
Special topics and problems as selected by the instructor.

ENG 640 Studies in American Literature (4 credits)

ENG 641 Studies in American Literature (4 credits)

ENG 642 Studies in Old and Middle English Literature (4 credits)

ENG 643 Studies in Renaissance Literature (4 credits)

ENG 644 Studies in 18th Century Literature (4 credits)

ENG 645 Studies in 19th Century Literature (4 credits)

ENG 646 Studies in Modern Literature (4 credits)

ENG 647 Studies in The Structure of English (4 credits)

ENG 648 Studies in Literary Theory (4 credits)

ENG 690 The Master's Project (4 credits)
Completion of a modest project of a creative, scholarly, or pedagogical nature proposed by the degree candidate.
Prerequisites: Permission of the Committee on Graduate Programs.

DEPARTMENT OF MATHEMATICS

The Department of Mathematics offers programs leading to the degrees of Master of Arts in mathematics and Master of Arts in Teaching in mathematics. The latter program is jointly sponsored by the College of Arts and Sciences and the School of Education.

THE MASTER OF ARTS DEGREE

The curriculum leading to the degree Master of Arts in mathematics is designed primarily to be the first part of a doctoral program. Suitable options are available to those students who seek employment in teaching, government, or industry immediately after receiving the degree. The student's individual curriculum is designed according to his preparation and interests. A normally prepared and progressing student can, while holding a teaching assistantship, satisfy all the requirements for the degree of Master of Arts in four semesters by taking an average of nine credits per semester. Because enrollment in the graduate program is small, students can expect to receive a good deal of individual attention and encouragement from the faculty.

Admission to Course

Applicants for the program should have strong undergraduate backgrounds in mathematics. It is highly desirable that their preparation include two courses in elementary real variable theory or advanced calculus, a course in linear algebra, and a course in abstract algebra. A course in general topology is also recommended. Students with deficiencies in these areas will be asked to correct the deficiencies early in the graduate program.

Requirements for the Degree

A total of 36 credits is required for the degree. Of this total, a maximum of 12 credits may be in 400-level courses; the remainder must be in 500-level courses. Each student must take at least 4 credits in problem seminars (MTH 590). Each student's program is supervised by a committee of two department members. The committee is charged with passing on the acceptability of the student's program and with setting a comprehensive examination for him or her near the end of the program.

COURSE OFFERINGS

(One credit hour is equal to one semester hour.)

MTH 422 Mathematical Methods in Operations Research (4 credits)
Decision problems in operations research, classical optimization techniques, mathematical programming, queuing theory, game theory and decision making, graphs and networks.

MTH 425 Probability (4 credits)

Combinatorial analysis, conditional probability, random variables, generating functions, recurrent events, random walk problems, Markov chains, and stochastic processes.

MTH 431 Methods of Mathematical Physics (4 credits)

Series solution of ordinary differential equations, special functions, separation of variables in various coordinate systems, boundary value problems, eigenvalue problems, Fourier series and integrals, Laplace transforms.

MTH 435 Introduction to Mathematical Science (4 credits)

The algebraic structures of scientific phenomena. Differential equations and dynamical systems. Partial differential equations of the physical and life sciences. Introduction to mathematical modeling.

MTH 451-452 Analysis (4 credits each)

An introductory course in real analysis. Topics covered include the topology of $\mathbb{R}^n$, limits, continuity, differentiation, Riemann integration, uniform continuity and convergence, Riemann-Stieltjes integration, and differentiation and integration in $\mathbb{R}^n$.

MTH 461 General Topology (4 credits)

A study of topological spaces and continuous functions. Separation and countability properties, connectedness, compactness, and local properties will be covered.

MTH 463 Graph Theory and Combinatorial Mathematics (4 credits)

An introductory course in combinatorics. Topics covered will include techniques of enumeration, fundamental concepts of graph theory, and applications to transport networks, matching theory, and block design.

MTH 465 Differential Geometry (4 credits)

Theory of curves and surfaces in Euclidean space with an introduction to the theory of matrix Lie groups.

MTH 475-476 Abstract Algebra (4 credits each)

Algebra of sets and mappings, groups and homomorphisms, rings and ideals, factorization and divisibility, vector spaces, linear transformations, fields and field extensions.

MTH 525-526 Probability and Statistics (4 credits each)

Combinatorial analysis, random variables, central limit theorem, recurrent events, distribution theory, sampling, statistical estimation, hypothesis testing, regression analysis, analysis of variance, and applications.

**MTH 531-532 Mathematical Methods
in Engineering (4 credits each)**

Functions of several variables, vector field theory, partial differential equations, boundary value problems, Fourier series, and Fourier integrals. (Also see page 57, School of Engineering)

MTH 541-542 Advanced Mathematical Science (4 credits each)

Structure of dynamical systems. Application to mechanics, wave motion, diffusion, and statistical mechanics. Dynamical systems and control theory in economics and the life sciences. Fundamental mathematical structures of the physical, life, and social sciences. The role of probability and statistical inference.

MTH 551-552 Real Analysis (4 credits each)

The general theory of measure and integration, including development of the Lebesgue integral, the classical Banach spaces, and elements of functional analysis.

MTH 555-556 Complex Analysis (4 credits each)

Analytical functions, Cauchy's theorem, representation theorems, analytic continuation, Riemann surfaces, conformal mapping.

MTH 561-562 Topology (4 credits each)

MTH 561 is an introduction to algebraic topology. Topics covered include elementary homotopy and homology theory. MTH 562 will cover various topics in algebraic and general topology at the discretion of the instructor.

MTH 565 Topological Algebraic Structures (4 credits)

A brief survey of topological groups, vector spaces, and algebras followed by detailed study of one or more special cases, such as locally compact groups, Lie groups, Lie algebras, Banach spaces, or Banach algebras.

MTH 571-572 Algebra (4 credits each)

Group theory, rings and modules, linear and multilinear algebra, and field extensions. Emphasis is placed, where possible, on categorical properties and functorial relationships.

MTH 590 Directed Reading and Research (2, 4, 6, or 8 credits)

THE MASTER OF ARTS IN TEACHING IN MATHEMATICS

The program leading to the degree of Master of Arts in Teaching in mathematics is sponsored jointly by the College of Arts and Sciences and the School of Education. It is intended to serve the needs of teachers in secondary schools or community colleges in southeast Michigan and is designed to accommodate those who are primarily interested in the teaching of mathematics as well as those who are primarily interested in mathematics. The program will prepare people for leadership positions in terms of teaching advanced courses and of determining directions of curriculum development.

Through the courses offered in the program, the candidate will have ample opportunity to learn of the applications of mathematics, of the construction of mathematical models, and of the art of problem-solving and to consider in depth problems of the secondary mathematics curriculum.

Students normally pursue work for the Master of Arts in Teaching on a part-time basis. During each of the fall and winter Semesters they normally take a single course which meets in the late afternoon to afford minimum disruption to the schedules of those engaged in secondary school teaching. Participation in the eight-week summer session, on the other hand, is usually full time. In this way the degree requirements can be satisfied in about two and one-half years.

Admission to Course

A background of at least 30 credits in undergraduate mathematics is normally required of the applicants. A special one-semester transitional course will be offered occasionally for those who are interested in the program but have not studied mathematics for some time.

REQUIREMENTS FOR THE DEGREE

The requirements for the degree of Master of Arts in Teaching are 36 credits of graduate work. In general, the candidate will take seven 4-credit courses arranged by the Department of Mathematics, one 4-credit course in education, and one in psychology. Among the courses arranged by the Department of Mathematics there must be included 4 credits in independent study (MTH 590), either in mathematics or in an interdisciplinary area involving mathematics, to be concluded with a written report. Each candidate must take a 4-credit course in analysis (MTH 517) or topology (MTH 461) and a 4-credit course in abstract algebra (MTH 514). At least one of these courses is offered each fall to insure that candidates can complete requirements for the degree in approximately two and one-half years, if summer courses are taken. The other four mathematics courses can be chosen from a variety of offerings. Candidates should consult with their advisers each semester on courses to be taken to complete requirements for the degree.

Each candidate's program is supervised by a committee of two advisers, who will assist in formulating a meaningful plan of action for the candidate and periodically review progress made toward the completion of the degree. As soon as possible after candidates have completed their six mathematics courses and prior to their independent reading assignment, they must take an examination. The examination will consist of a list of about ten problems, selected by the adviser, varied both in context and in difficulty. Candidates will have one month in which to work on these problems, after which they

will give an oral presentation on the solutions of a proper subset of these problems, to be selected by their advisers.

Maximum flexibility is allowed in the choice of the required courses in education and psychology. Normally a candidate will choose the education course from among ED 601, 602, 603, or 604. However, a course in the teaching of reading in the content area would be of special interest to teachers in mathematics. In general, a course in Developmental Psychology (PSY 510), Tests and Measurement (PSY 512), or Behavior Theory and Learning (PSY 540) is chosen to fulfill the psychology requirement.

COURSE OFFERINGS

(One credit hour is equal to one semester hour.)

MTH 325-326 Introduction to Mathematical Statistics (4 credits each)

A study of random variables and distributions, random sampling, point estimation, interval estimation, tests of hypotheses, regression, and distribution-free methods. The theory is illustrated through applications to various fields.

MTH 335-336 Introduction to Numerical Analysis (4 credits each)

An introduction to mathematical methods appropriate to computer work. Topics treated include interpolation, approximation, quadrature, solution of differential equations, and matrix computation.

MTH 372 Number Theory (4 credits)

Number-theoretic functions, diophantine equations, congruences, and quadratic residues. Offered every year.

MTH 415 Foundations of Mathematics (4 credits)

An examination of the logical foundations of mathematics including analysis of the axiomatic method, basic set theory, cardinal and ordinal numbers, and the axiom of choice.

MTH 416 Concepts of Geometry (4 credits)

A development of geometry from an algebraic and metric viewpoint, concentrating on Euclidean geometry. Especially appropriate for Master of Arts in Teaching candidates.

MTH 425 Probability (4 credits)

Combinatorial analysis, conditional probability, random variables, generating functions, recurrent events, random walk problems, Markov chains, and stochastic processes.

MTH 461 General Topology (4 credits)

A study of topological spaces and continuous functions. Separation and countability properties, connectedness, compactness, and local properties will be covered.

MTH 504 Review of Abstract Ideas (4 credits)

This course is a review of mathematical concepts, including topics from set theory, logic, number theory, algebra, and analysis. It is intended to be a transitional course for those who are interested in the MAT program but need refresher work. It may NOT be used for credit toward the degree.

MTH 510 The Secondary Mathematics Curriculum (4 credits)

This is a seminar course which will examine in depth some of the problems of the secondary mathematics curriculum. Topics discussed will be determined jointly by the instructor and the students. Emphasis will be on the role and responsibility of the secondary teacher in developing the curriculum.

MTH 514 Concepts in Abstract Algebra (4 credits)

Designed for Master of Arts in Teaching candidates. Includes topics from groups, rings, fields, matrices, linear transformations, and vector spaces. Offered every other year. Alternates with MTH 517.

MTH 516 Computers and Secondary Mathematics (4 credits)

This course is an introduction to the computer with emphasis on use of the computer in secondary mathematics courses, along with selected mathematics laboratory activities.

MTH 517 Concepts in Analysis (4 credits)

Designed for Master of Arts in Teaching candidates. Includes a study of real and complex numbers, functions, limits, differentiation, integration, and infinite series, with emphasis on careful proofs of theorems. Offered every other year. Alternates with MTH 514.

MTH 519 Linear Mathematics and Mathematical Models (4 credits)

This course will include topics from linear algebra, game theory, and linear programming with applications to the social sciences.

Except for financial aid no upper limit to number of student.

DEPARTMENT OF PHYSICS

THE MASTER OF SCIENCE IN PHYSICS

The program leading to the degree of Master of Science in physics consists of courses, research, seminar participation, and a final research report or critical essay. A formal thesis is not required. Students receiving the degree will be prepared to work toward the degree of Doctor of Philosophy in physics, to teach at the junior college or secondary school level, or to work in industry.

The average candidate entering in the Fall semester will usually require two academic years to complete the degree. A very well prepared candidate could complete the required courses and research credits in three semesters. Each student's program will be adjusted to his interests and background. PHY 673, research, and a final written report or critical essay are the only fixed requirements.

Admission to Course

An applicant for admission to the Master of Science program should have a bachelor's degree from an accredited institution or proof of equivalent achievement. The Graduate Record Examination may be accepted in lieu of a formal degree. The applicant's background should be strong in physics and mathematics.

Transfer Credits

A student may request transfer credits for work done at another institution. A petition, endorsed by his adviser, should be submitted to the Department's Graduate Program Committee, and transcripts and catalog descriptions of the courses for which credit is requested should accompany the petition. In all cases, it shall be the responsibility of the candidates to demonstrate that the work done is relevant and complementary to his Oakland program. Such a petition should be made as early as possible in the student's program and not later than the first week of the semester in which the student expects to graduate.

Requirements for the Degree

The basic degree requirement is successful completion of 36 credits of graduate courses distributed as follows: 4 credits of PHY 673: Quantum Mechanics; 24 credits of additional 400-, 500-, or 600-level courses approved by the Department; 8 credits of research, including a final written report or critical essay.

Research Fields and Facilities

The faculty of the Department of Physics now consists of two theoretical nuclear physicists, four low energy experimental nuclear physicists, two solid-

Prereq. Intermediate E & M Mechanics
not essential. Mod. Physics nice but not essential.
Shiny Electronics lab is new essential students. Will probably have to reach state physicists and a biophysicist. Current research fields include theoretical programs in nuclear structure and elementary particles, experimental programs in low energy nuclear physics and low temperature solid-state physics, a unique program in the gyromagnetic properties of solids, studies on electrically mediated growth mechanisms in living systems, and a program in the natural radiation environment. Available for low energy nuclear physics are a 450 Kv Cockcroft-Walton nuclear particle accelerator, a 1024 channel pulse-height analyzer, a time-of-flight analyzer and associated fast-pulse electronics for work in particle scattering, gamma-ray spectroscopy and nuclear instrumentation development; available for solid state physics, a high field nine inch Varian magnet, liquid helium cryostats and associated equipment for measurements of superconductivity, electronic structures of metals, phase transitions and the cryogenic properties of solids utilizing ultrasonic techniques at VHF, UHF and microwave frequencies. The Kettering Magnetics Laboratory, unique in the United States, provides a special non-magnetic facility containing eight-foot diameter Helmholtz magnetic field neutralizing coils for use in gyromagnetic studies of solids (Einstein-deHaas Effect) and in gases (Scott Effect) or other research requiring a stable magnetic and/or mechanical environment. An eight inch Newtonian or Cassegrain reflecting telescope is housed in a separate observatory. Supporting facilities include an electronics shop, a student shop, and a well-equipped machine shop staffed by experienced instrument makers. Computer facilities include an on-campus IBM 360-40 as well as off-campus access to a medium size fast CDC 3600 and a large-fast-time-sharing CDC 6500.

That's
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COURSE OFFERINGS

(One credit hour is equal to one semester hour.)

Selected 400-level Courses Which May Carry Graduate Credit

PHY 417-418 Advanced Laboratory (2 credits each)

Methods of experimental physics. Experiments and projects in all areas of classical and modern physics, with emphasis on research techniques and detailed analysis of experimental data.

Prerequisites: PHY 317-318, 341, and 347-348, or equivalent.

Prerequisites or corequisites: PHY 331 and 361, and 371, or equivalent.

PHY 421 Thermodynamics (4 credits)

Principles of non-relativistic quantum mechanics. Schrödinger wave equation, expectation values of energy, position, momentum and angular-momentum operators, spin, perturbation theory, and identical particles—with applications to atomic systems.

Prerequisites: PHY 361 and MTH 255, or equivalent.

PHY 482 Electricity and Magnetism II (4 credits)

Multipole fields, solutions of Laplace and Poisson equations, electromagnetic waves in insulators and conductors, the derivation of the laws of optics from Maxwell's equations.

Prerequisites: PHY 381 and MTH 255, or equivalent.

GRADUATE COURSES

PHY 542 Advanced Electronics (4 credits)

Selected topics in the analysis and design of electronic circuits.

Prerequisites: PHY 341 or equivalent.

PHY 548 Advanced Electronics Laboratory (2 credits)

Prerequisite: PHY 348 or equivalent.

PHY 562 Mechanics (4 credits)

Methods of Lagrange and Hamilton, tensor algebra, rigid bodies in three dimensions, continuous media, and coupled systems.

Prerequisites: PHY 361 and MTH 255, or equivalent.

PHY 573 Nuclear Physics (4 credits)

The properties of ground and excited states of nuclei, nuclear reactions, fundamental particles, nuclear forces; interaction of particles and photons with matter, and nuclear particle detectors.

Prerequisite: PHY 472 or equivalent.

PHY 574 Introduction to Solid State Physics (4 credits)

An introduction to the thermal, electrical, and magnetic properties of solids, which includes periodic structure, lattice dynamics, electron interactions and behavior, transport properties, Fermi surface, optical behavior, and superconductivity, emphasis on current experimental techniques.

Prerequisites: PHY 472 and 562, or equivalent.

PHY 600 Seminar (1 credit)

PHY 673 Quantum Mechanics (4 credits)

Review of Schrödinger wave mechanics, formal algebraic approach to quantum mechanics approximation methods, elastic scattering.

Prerequisites: PHY 472 and 562, or equivalent.

PHY 674 Advanced Quantum Mechanics (4 credits)

Continuation of PHY 673. Angular momentum, identical particles, formal scattering theory, relativistic wave equations, quantization of radiation.

Prerequisite: PHY 673.

PHY 690 Research (2 to 12 credits)

*Numbers
Very few in clinical - will have to publish
Developmental could probably take 10*

*A.R.E. upper 30% adv. P.
Verbal - watch for
Quant. - watch for
on development
Research exp. - desired
Field exp. - desired.*

DEPARTMENT OF PSYCHOLOGY

THE MASTER OF ARTS IN PSYCHOLOGY

The primary purposes of the programs leading to the degree of Master of Arts in psychology are to train students at the intermediate professional level and to initiate students into advanced scholarship in preparation for additional graduate study at other institutions. The areas in which a student may concentrate are clinical psychology or developmental psychology.

Admission to and Requirements for Clinical Psychology

The program in clinical psychology is designed to prepare students to evaluate and treat patients in a clinical setting. Individuals interested in becoming school diagnosticians will require some further preparation in educational psychology, but will find the basic program appropriate for acquisition of needed clinical skills. Students who complete the Master of Arts in clinical psychology are eligible for certification by the State of Michigan as psychological examiners.

An applicant for admission should have a bachelor's degree from an accredited institution or proof of equivalent achievement. While an undergraduate major in psychology is not required, students are expected to be acquainted with the field to the extent of having had the following courses or their equivalents: Foundations of Introductory Psychology, Experimental Psychology, Statistics and Research Design, and Abnormal Psychology. Theories of Personality is additionally recommended. Applications for admission are reviewed and decisions rendered March 15, for admission the following September, which is the only time that new students are admitted. The number of students admitted to this program is limited.

The clinical program is a two-year program. The first year the typical student takes two courses each semester. These courses are generally offered in the late afternoon. The second year the student must have sufficient time for the practicums, which require half time during the traditional work week. It is the student's responsibility to have the time available for the practicums. Nine courses (36 credits) are required. All students must take the Pro-Seminar (PSY 691) and Research Methods and Project (PSY 692). In addition, the curriculum must include Advanced Abnormal (PSY 624), Individual Testing (PSY 620), Projective Tests (PSY 621), Clinical Psychology (PSY 622), and Practicum I and II (PSY 625). Students in the clinical program have the option of completing a research project (PSY 690) or of taking an elective course, such as Child Clinical Psychology (PSY 623). Those students who plan to go on for a Ph.D. are strongly urged to complete the research project.

Practicum placements are arranged through faculty members and must be approved by the clinical faculty. Ordinarily, one semester (20 hours per

*4 books
21 way
minimum
4 credits*

week) is devoted to diagnostic workups and the second semester to therapy under intensive supervision. No practicum placements may be made during the summer.

A 3.0 or B average is required to remain in good academic standing. In addition each clinical student must receive at least a 3.0 in each of the testing courses and satisfactorily complete both practica in order to graduate.

Since the clinical program is a professional one, academic standing is only one of the criteria used to evaluate student qualifications for both admission and graduation.

Inquiries should be directed to David Lowy, Associate Professor of Psychology.

Admission to and Requirements for Developmental Psychology

The program in developmental psychology is designed to familiarize students with the theoretical, research, and applied issues of life span development as manifested in specified age groupings: childhood, adolescence, maturity, old age. Emphasis is on training the student in the application of developmental psychology in a wide variety of community settings.

21 cred minimum
An applicant for admission should have a bachelor's degree from an accredited institution or proof of equivalent achievement. While an undergraduate major in psychology is strongly recommended, it is not required. All applicants are expected, however, to be acquainted with the field to the extent of having had the following courses or their equivalents: Foundations of Introductory Psychology, Statistics and Research Design, Experimental Psychology, and Child Development or Adolescence, or Socialization in the Family. Applications for admission are reviewed and decisions rendered in March, May, and July of each year for admission the following September, which is the only time that new students are admitted.

Nine courses (36 credits) are required. All students must take the Pro-Seminar (PSY 691), Research Methods and Project (PSY 692), Theories of Development (PSY 575), Perceptual and Cognitive Development (PSY 571), Social and Personality Development (PSY 570), Psychology of Adolescence and Aging (PSY 572), Applied Developmental (PSY 670), and Assessment and Decision Making Procedures in Developmental Psychology (PSY 671), and must complete a research thesis.

Students take two courses a semester (classes meet in the evening), requiring a minimum of two academic years for acquiring a degree.

After students have completed 16 credits (normally 4 courses), the student's progress will be evaluated. A grade point average of 3.0 or better

is required for good academic standing. In addition, two grades below 3.0 or one grade below 2.5 render a student subject to removal from the degree program.

Inquiries should be directed to Irving Torgoff, Associate Professor of Psychology.

COURSE OFFERINGS

(One credit hour is equal to one semester hour.)

PSY 510 Developmental Psychology (4 credits)
Description and evaluation of principles and theories of development from birth to maturity. Maturation processes, learning, and emotional disturbances among the issues considered.
Prerequisite: Permission of the instructor or acceptance into the Master of Arts in Teaching program.

PSY 512 Tests and Measurement (4 credits)
Theories of measurement and evaluation. Construction and examination of tests of ability, achievement, interests, and special aptitudes. Objective tests of personality.
Prerequisite: Permission of the instructor or acceptance into the Master of Arts in Teaching program.

PSY 513 Psychopathology of Childhood (4 credits)
A survey of the psychopathology of children and adolescents, emphasizing dynamic and cognitive-perceptual-motor variables.
Prerequisite: PSY 510 or 512 or acceptance into the Master of Arts in Teaching program in special education, or acceptance into the graduate program in psychology, or undergraduate major in psychology, or permission of the instructor.

PSY 540 Behavior Theory and Learning (4 credits)
Conditioning, reinforcement, punishment, drives, and transfer of training will be studied in their relationship to such complex human processes as education, psychotherapy, and the development of motives.
Prerequisite: Permission of the instructor or acceptance into the graduate program.

PSY 541 Advanced General Psychology (4 credits)
A survey of the current frontiers of knowledge and new methodology in the whole range of psychology. Intended for senior majors and graduate students. (Normally offered in the fall semester.)
Prerequisite: Permission of the instructor.

PSY 551 Advanced Statistics (4 credits)

Following a review of descriptive and simple inferential statistics, major emphasis will be given to analysis of variance procedures.

Prerequisite: An undergraduate course in statistics.

PSY 570 Social and Personality Development (4 credits)

Theory, research, and applied activity focusing on familial and extra-familial socialization, parent-child relations, peer influences, and impact of social change on personality. Field experiences.

Prerequisite: Acceptance into the graduate program in developmental psychology, or permission of the instructor.

PSY 571 Perceptual and Cognitive Development (4 credits)

Developmental nature of perception, learning, reasoning, concept formation, cognitive style, problem-solving behavior, and language. Field experiences.

Prerequisite: Acceptance into the graduate program in developmental psychology, or permission of the instructor.

PSY 572 Psychology of Adolescence and Aging (4 credits)

An examination of significant structural, functional, and behavioral changes during adolescence and old age. This material will be integrated with field experiences in relevant applied settings.

Prerequisite: Acceptance into the graduate program in psychology or permission of the instructor.

PSY 575 Theories of Development (4 credits)

Issues and theories concerning the developmental process from birth to old age. Approaches of such theorists as Lewin, Freud, Piaget, Erikson, and leading exponents of social-learning theory examined.

Prerequisite: Acceptance into the graduate program in developmental psychology or permission of the instructor.

PSY 590, 591, 592, 593, 594, 595 Seminar (4 credits)

Seminars offered occasionally by faculty members to explore special topics not listed among regular offerings, either on own initiative or request of a group of students.

Prerequisite: Permission of the instructor.

PSY 597, 598 Apprentice College Teaching (4 credits)

Supervised participation in teaching of undergraduate psychology courses. Discussion of teaching objectives and methods. Only one course may be offered in fulfillment of departmental requirements.

Prerequisite: Permission of the instructor.

PSY 620 Individual Testing (4 credits)

Theory of intelligence testing. Administration and interpretation of Stanford-Binet and Wechsler tests.

Prerequisite: Acceptance into the graduate program in clinical psychology.

PSY 621 Projective Tests (4 credits)

Theory, demonstration, and practical training in the use of projective techniques with special emphasis on Rorschach and the thematic apperception test.

Prerequisite: Acceptance into the graduate program in clinical psychology.

PSY 623 Child Clinical Psychology: Normal and Abnormal Social-Personality Development (4 credits)

An examination of normal and abnormal social-personality development in children, with emphasis on causative factors and implications for clinical activity.

Prerequisite: Admission to a graduate program in psychology.

PSY 624 Advanced Abnormal (4 credits)

Review of the major neurotic, psychotic, psychosomatic, and organic syndromes. Current issues and research in psychopathology.

Prerequisite: Acceptance into the graduate program in clinical psychology.

PSY 625 Practicum I and II (8 credits)

Practical experience in areas of specialized training. Credit for the first semester will not be granted until the second semester has been successfully completed.

Prerequisite: Admission to the graduate program in clinical psychology and permission of the adviser.

PSY 626 Child Clinical Psychology: Technique of Assessment and Intervention (4 credits)

An examination of various techniques for assessing and modifying the behavior of children and families with problems.

Prerequisite: Admission to the graduate program in clinical psychology and PSY 623.

PSY 670 Applied Developmental Psychology (4 credits)

Analysis of the role of the developmental psychologist in the context of social action programs.

Prerequisite: Acceptance into the graduate program in psychology.

PSY 671 Assessment and Decision Making Procedures in Developmental Psychology (4 credits)

Examination of procedures assessing developmentally relevant characteristics of individuals, their relations to others, to groups (peers, family, etc.) and to setting (home, school, institution).

Prerequisite: PSY 692 or permission of the instructor.

PSY 690 Research Project (4 credits)

Individual research project related to the student's area of concentration.

Prerequisite: Admission to the graduate program in psychology and permission of the adviser.

PSY 691 Pro-Seminar (4 credits)

An overview of current major issues and research in personality, learning, perception-cognition, social psychology, and motivation.

Prerequisite: Acceptance into the graduate program in psychology.

PSY 692 Research Methods and Project (4 credits)

A study of issues involved in the formulation of research problems and hypotheses, design strategies, and techniques of data analysis. Each student will be required to design an individual research project.

Prerequisite: Acceptance into the graduate program in psychology.

SCHOOL OF EDUCATION

THE MASTER OF ARTS IN TEACHING

The College of Arts and Sciences and the School of Education jointly sponsor secondary education candidates for the degree of Master of Arts in Teaching. Secondary education programs are available now in English (see p. 20) and mathematics (see p. 26).

The School of Education sponsors candidates for the degree of Master of Arts in Teaching in elementary education, in reading instruction, and in special education (for emotionally disturbed children). A program in elementary guidance and counseling is in the process of receiving final approval.

Requirements for the Degree: General Requirements in all Programs

Students who wish to enter any Master of Arts in Teaching program must complete application procedures for admission to graduate study. Admission is selective, and the School of Education will consider each applicant's case on its merits. After initial acceptance (admission to course), the student is assigned a guidance committee and an adviser to assist in program planning. After students have completed 12 credits (normally three courses), the committee will evaluate their progress and plan the remainder of their programs. A grade point average of 3.0 or better is expected for good academic standing. In addition, two grades below 3.0 or one grade below 2.0 render a student subject to suspension from the degree program.

The School of Education reserves the right to expand typical requirements in order to correct deficiencies or to bring up to date the preparation of degree aspirants.

The Master of Arts in Teaching programs consist of 36 credits, of which 4 are normally reserved for a terminal project. This project may, but need not, be a thesis. The student and the committee will plan the nature and scope of the project appropriate for each individual. Many types of projects may be approved. One student may decide to write a master's thesis. Another may wish to do a controlled study on the effectiveness of various instructional techniques. A third may wish to try out an experimental unit, and a fourth may propose the development of a teaching device of novel design. In some instances the student and committee may decide that a special set of comprehensive or field examinations might be appropriate. The latitude permitted is extremely broad.

School of Education Requirements for the Degree of Master of Arts in Teaching in English and Mathematics.

In general, most of the student's work will be in the discipline area of the major, with such cognates as the major department prescribes, but each program will contain 4 credits chosen from History of Education (ED 601), Philosophy of Education (ED 602), Comparative Education (ED 603), or Sociology of Education (ED 604); 4 credits in either Developmental Psychology (PSY 510) or Tests and Measurement (PSY 512); and 4 credits devoted to problems of teaching the discipline of the major (in courses conducted by the major departments).

Requirements for the Degree of Master of Arts in Teaching in Elementary Education

This program is designed for the elementary school classroom teacher. With the help of his or her adviser, each student plans an individualized program responsive to his special needs and concerns. There are four areas of instruction from which each student must select the courses that will comprise his individualized program. These areas are: A. Curriculum Development and Organization (basic principles of curriculum development and methods for implementing curricular change); B. Diagnosis and Prescription (methods for analyzing student needs); C. Support courses (intensive study of specialized phases of elementary school instruction); D. Administration and Supervision (consideration is given to the ways elementary school teachers can help one another carry out their responsibilities).

Requirements for the Degree of Master of Arts in Teaching in Reading Instruction

Each student completes a core program which meets standards established by the International Reading Association for the title 'reading specialist.' This core program consists of six courses. Then each student selects either a general sequence of courses to finish his or her program or a sequence of courses in one of six specialization areas. The areas of specialization are: (1) Elementary Reading (emphasis upon the unity of language arts and ways of integrating reading with oral language development and writing); (2) Secondary Reading (ways to integrate teaching of reading and secondary content areas); (3) Consultation (development of skills necessary for implementation of large scale reading programs); (4) Special Education (ways of teaching reading to special children); (5) Guidance (ways of co-ordinating reading instruction with the work of the guidance counselor); (6) Early Childhood (ways to prepare preschool children for learning to read and to write).

Requirements for the Degree of Master of Arts in Teaching in Special Education (for Emotionally Disturbed Children)

In keeping with Michigan State Department of Special Education Guidelines and actual trends within the field of special education, the special education faculty offers three alternatives to graduate students:

1. Special Education—approval in the area of Emotionally Disturbed Children (36 credit hours).

A graduate of this program will be approved to teach in Special Education classes for emotionally disturbed or to serve as a teacher consultant for emotionally disturbed children.

2. Special Education—approval in the area of Emotionally Disturbed Children, with a concentration in Reading (44 credit hours).

A graduate of this program will have 'Reading Concentration' noted on his transcript in addition to his or her approval in the emotionally disturbed. Field trends in special education make this concentration quite useful.

3. Special Education—approval in the area of Emotionally Disturbed Children, with endorsement in Guidance and Counseling (48 credit hours).

New special education legislation in the State of Michigan is sending children with moderate behavior problems into regular classrooms. Regular classroom teachers will consequently need special education skills and skills in counseling children. This program is designed to develop these skills.

CERTIFICATION

Programs leading to the degree of Master of Arts in Teaching are based on the assumption that students already hold (or are eligible for) at least the Michigan Provisional Certificate in the area of their specialization. Students who hold no certificate or who wish to change specialization must expect a longer period of study than is implied by the programs described. Usually, however, combining certification with a Master of Arts in Teaching program will require a shorter sequence of preparation than that involved in obtaining certification and the master's degree separately. Those interested in a combined program should ask the School of Education for assistance in planning a course of study. Budgetary and other limitations permit that only degree-seeking students can be accepted for certification. In these cases student teaching will be delayed until all degree requirements have been completed.

COURSE OFFERINGS

(The School of Education reserves the right to restrict enrollment in any graduate course where pedagogical or physical limitations make a restriction desirable. One credit hour is equal to one semester hour.)

ED 500 Foundations of Reading Instruction (4 credits)
Study of reading as a psycholinguistic process. Examination of alternative strategies in word recognition and comprehension.

ED 501 Introduction to the Education of Exceptional Children (4 credits)
Study of types of exceptionalities, growth and development of exceptional children, and organization of special education programs.
Prerequisite: Graduate standing.

ED 502 Skills and Competencies for Teachers of Exceptional Children (4 credits)
Study of basic learning processes, evaluation of personality and intellectual deviation, and consideration of classroom management techniques.
Prerequisites: ED 501 or permission of instructor.

ED 509 The School and the Disadvantaged Child (2 or 4 credits)
Study of the relation between disadvantaged communities and their schools.
Prerequisite: Permission of instructor.

ED 511 Interaction Analysis (4 credits)
Techniques of gathering and analyzing data about effective and cognitive behaviors in the classroom.
Prerequisite: Admission to a graduate program or permission of instructor.

ED 512 Curriculum Development in the Public School (4 credits)
Study of the role of the curriculum in elementary and secondary schooling.

ED 513 The Organization of the Elementary School (4 credits)
History of elementary school organization and the bearing of contemporary curriculum revision upon elementary school organization.

ED 522 Behavior Modification Techniques for Classroom Management (4 credits)
Methods for changing children's behavior in the classroom.
Prerequisites: Bachelor's degree and current teaching experience.

ED 523 Educational Procedures for Children with Learning Disabilities (4 credits)
Concise review of various learning disability theories and methods for remediation.
Prerequisite: One year's teaching experience.

ED 524 Perception in the School Setting (4 credits)
Relation of perception to classroom learning; diagnosis and remediation of perceptual problems in the classroom.
Prerequisite: Graduate standing.

ED 527 Problems in Educating Mentally Handicapped Children (4 credits)
Methods for teaching mentally handicapped children.
Prerequisite: Graduate standing.

ED 531 Current Trends in the Teaching of Reading (4 credits)
Intensive examination of current practices in the teaching of reading.

ED 532 Teaching Reading in the Primary Grades (4 credits)
Principles of early elementary reading instruction.

ED 533 Teaching Reading in the Upper Grades (4 credits)
Principles of later elementary reading instruction.

ED 534 Language Arts Instruction in the Elementary Schools (4 credits)
A co-ordinated language arts approach to the development of language skills in children.

ED 536 Teaching Reading to the Special Child (4 credits)
Study of reading instruction techniques for slow learners, emotionally disturbed, handicapped, and gifted children.
Prerequisite: ED 521 or permission of instructor.

ED 537 Teaching-Learning Strategies for Reading and Related Language Arts Instruction (4 credits)
Study of teaching-learning strategies for divergent, elaborative, and critical thinking in all aspects of language arts.

ED 538 Reading Development in Junior and Senior High Schools (4 credits)
Development, implementation, and evaluation of all school reading programs.

ED 540 Theories of Early Childhood Education (4 credits)
Contemporary theories of early childhood.

ED 550 Practicum in Early Childhood Education (4, 8 credits)
Companion course to ED 540; experience working with infants and young children in a variety of settings.

ED 555 Practicum for Teachers of the Urban-Rural Disadvantaged (8 credits)

Performance based, field-centered experiences of teaching disadvantaged children.

Prerequisite: Open to graduate students enrolled in special projects.

ED 560 Special Problems in Guidance and Personnel Work (2, 4, 6, or 8 credits)

Problems of school guidance and counseling, college student personnel work, and employment counseling.

Prerequisite: Permission of instructor.

ED 561 Guidance and Counseling for Children (4 credits)

Guidance and counseling techniques for teachers in classrooms.

Prerequisite: Permission of instructor.

ED 562 Assessment of Children (4 credits)

Individual and group analysis techniques for assessment of children.

Prerequisite: Permission of instructor.

ED 563 Group Procedures in Guidance (4 credits)

Study of group processes in educational settings.

Prerequisite: Permission of instructor.

ED 567 Workshop in Guidance and Personnel Services (2, 4, 6, or 8 credits)

In-service education on guidance techniques for employees in various personnel services.

Prerequisite: Permission of instructor.

ED 570 Advanced Topics in Literature for Children (4 credits)

Analysis of recent literature for children; consideration of ways to help children understand and enjoy a wide variety of literary forms.

ED 571 Children's Books in the Elementary School Curriculum (4 credits)

Children's reading materials, excluding textbooks, as part of the elementary curriculum. Locating, selecting, evaluating, and organizing children's reading materials.

Prerequisite: ED 332 or ED 570.

ED 572 Creative Dramatics (2 credits)

Children's use of their imaginative and dramatic skills to interpret literature and to create plays, pantomimes, and other creative dramatic experiences.

Prerequisite: ED 332 or ED 570.

ED 573 Storytelling (2 credits)

Learning to select, learn and tell stories for children of various ages.

Prerequisite: ED 332 or ED 570.

ED 574 Literature for the Pre-School Child (4 credits)

Selection and use of appropriate books, rhymes, stories, records and film-strips with pre-school children. Students must be working with pre-school children at the time the course is being taken.

Prerequisite: ED 332 or ED 570 or enrollment in an Early Childhood Education Program.

ED 581 Teaching About Black Africa in the Public School (4 credits)

Organization and development of an instructional unit in Black Africa for elementary or secondary school use.

Prerequisite: Admission to graduate program or permission of instructor.

ED 582 Play Production for Secondary School Teachers (4 credits)

Production techniques for secondary dramatics.

ED 583 The Middle School (2, 4 credits)

Organization and curricula of the middle school.

Prerequisite: ED 512.

ED 584 The Open Classroom (2, 4 credits)

In-depth examination of the open classroom as a philosophic as well as a practical reordering of the traditional elementary classroom.

ED 585 The Law and Public Education (4 credits)

Introduction to school law for the practicing classroom teacher.

Prerequisite: Permission of instructor.

ED 586 Education of the Spanish-Speaking in the United States (4 credits)

Study of the problems Latinos confront in schools; consideration of approaches to educating the Spanish-speaking.

Prerequisite: Admission to graduate program.

ED 587 Social Studies in the Elementary School (4 credits)

Current trends in social studies instruction; emphasis on relationships between disciplines comprising social studies.

Prerequisite: ED 245 and acceptance into a graduate or certification program or major standing in elementary education.

ED 590 Special Problems in Education (2, 4, 6, or 8 credits)

Specialized problems in various phases of education.

Prerequisite: Admission to course in any graduate program or permission of the department.

ED 591 Ecology of the Classroom (4 credits)
Ecological context of the classroom, school, and community.
Prerequisite: Permission of the instructor or acceptance into any graduate program.

ED 592 Research Techniques in Education (4 credits)
Procedures for investigating education.
Prerequisite: Acceptance in a master's program in education and permission of the instructor.

ED 601 History of Education (4 credits)
Study of Western institutions as they shaped and were shaped by the education of the young.
Prerequisite: Admission to course in any graduate program.

ED 602 Philosophy of Education (4 credits)
Study of philosophical inquiry in relation to education.
Prerequisite: Admission to course in any graduate program.

ED 603 Comparative Education (4 credits)
Education and its relationship to social and economic change in various cultures.
Prerequisite: Admission to course in any graduate program.

ED 604 Sociology of Education (4 credits)
Impact of society upon schooling.
Prerequisite: Admission to course in any graduate program.

ED 611 Problems in Elementary Education (4 or 8 credits)
Student needs will determine issues for study in curriculum and methodology of elementary schools.
Prerequisite: Admission to course in a graduate program in elementary education or in reading instruction.

ED 612 Curriculum Studies (4 credits)
Study of curriculum research in modern elementary schools.
Prerequisite: Admission to course in a graduate program in elementary education or in reading instruction.

ED 620 Social Deviancy in Special and Regular Education (4 credits)
Analysis of social deviance from an individual, institutional and societal perspective.
Prerequisite: Admission to graduate program in special education or permission of instructor.

ED 621 Management and Curriculum for Emotionally Disturbed Children (4 credits)
Diagnosis and treatment of emotionally disturbed children in educational and clinical settings.
Prerequisite: ED 521 and one graduate course in psychology.

ED 622 Practicum in Special Education (6 credits)
Specialized field experience in a special education setting.
Prerequisite: Completion of all other requirements for the Master of Arts in Teaching in Special Education or permission of instructor.

ED 623 Seminar in Special Education (2 credits)
Action research project to be completed in conjunction with ED 622.

ED 624 Directed Teaching in Special Education (6 credits)
Supervised full-time teaching experience in classrooms corresponding to a student's concentration in special education.
Prerequisite: Acceptance in a master's program in special education and approval by the director of the special education program.

ED 627 Physical and Social Competencies of Handicapped Children (4 credits)
Identification of physical and social competencies necessary for mentally handicapped children to become productive citizens.
Prerequisite: Admission to graduate program in special education or permission of instructor.

ED 630 Seminar in Reading (4 credits)
Evaluation of reading and language arts research.
Prerequisite: Two courses in reading instruction or permission of instructor.

ED 631 Problems in Reading Instruction (4 or 8 credits)
Study of diagnostic, methodological, organizational, and administrative issues in reading programs.

ED 632 Diagnosis of Reading Disabilities (4 credits)
Laboratory course in analysis of factors which contribute to reading disabilities in elementary and/or secondary school pupils.
Prerequisite: ED 500 or equivalent or permission of instructor.

ED 633 Correction of Reading Disabilities (4 credits)
Laboratory courses on methods for helping disabled readers.
Prerequisite: ED 632 must be taken in the semester immediately preceding enrollment in this course.

**ED 634 Advanced Study of Classroom Strategies in an
Integrated Language Arts Curriculum (4 credits)**

Strategies for developing reading-language abilities.
Prerequisite: ED 537 recommended but not required.

ED 635 Organization of Reading Programs (4 credits)

Methods for program planning in reading instruction.
Prerequisite: ED 632, 633 or permission of the instructor.

ED 664 Consultation in Pupil Personnel Work (4 credits)

Techniques by which school counselors can help teachers, parents, and administrators help children.
Prerequisite: Permission of the instructor.

ED 665 Guidance Information and Career Development (4 credits)

Procedures for providing guidance information and ways to help elementary and junior high school children understand their interests and abilities.
Prerequisite: Admission to the program in guidance and counseling or permission of instructor.

ED 666 Practicum in Guidance and Counseling (4 credits)

Field experience at counseling in various settings.
Prerequisite: Admission to the program in guidance and counseling or permission of instructor.

ED 699 Terminal Project (4 credits)

Planning and execution of a research study or instructional technique under supervision of student's guidance committee.
Prerequisite: Written approval of the student's guidance committee. Students should request such approval from their advisers early in the fall semester for registration in the winter semester, and early in the winter semester for registration in the spring and summer sessions or fall semester. During the preparation of the terminal project students must remain in constant touch with their advisers and must present the completed project no less than two weeks before the end of classes in the term of graduation.

SCHOOL OF ENGINEERING

THE MASTER OF SCIENCE IN ENGINEERING

The School of Engineering offers work leading to the degree of Master of Science in engineering, with concentrations in systems engineering, energy engineering, and electromagnetic and optical engineering. The electromagnetic and optical engineering concentration places special emphasis on properties of materials, such as electronic properties of semiconductors and optical testing of strength of metals. Minor concentrations may be arranged in physics and mathematics. Students whose special interests cross the boundaries of these areas may arrange interdisciplinary courses of study. Programs ordinarily do not require a thesis; emphasis is rather placed on a design project carried out by the individual or by a small group. The object of the Master of Science program is to provide participants with a broad training in an area of engineering rather than a narrow apprenticeship in a specific research area. Specialized research is more appropriately delayed for doctoral thesis preparation.

Courses are arranged in the late afternoon and early evening for the convenience of students employed in industry. Such part-time students should be aware, however, of the very real demands placed on them by graduate studies and should keep outside work commitments within reasonable bounds.

Admission to Course

The program leading to the degree of Master of Science in engineering is designed to accommodate students with a wide variety of undergraduate backgrounds. A bachelor's degree in physics, mathematics, or any recognized field of engineering represents excellent preparation; a degree in any other field of science is also acceptable, but a student presenting such a degree should plan to spend additional time in residence in order to gain proficiency in the fundamentals of engineering.

Admission to master's study in engineering is selective; applicants should have upper-quartile rank. In addition to his bachelor's degree, an applicant should present academic transcripts and recommendations from two members of his undergraduate department who are familiar with his level of accomplishment and promise. These recommendations form a most important part of the admission credentials.

Requirements for the Degree

A student's progress toward the MS degree is guided by his Master's Committee, a group composed of three School of Engineering faculty mem-

bers, two selected by the student and one appointed by the Dean of Engineering. Each student must form a Master's Committee during his first semester of enrollment. Failure to do so may result in additional semesters of work to complete degree requirements.

The master's degree in engineering is never conferred for completing a random selection of courses; a planned program is essential. The basic degree requirement is successful completion of at least 32 credits of graduate courses in engineering and related areas of the sciences, mathematics, or management, the whole to form an integrated program of study proposed by the student and approved in advance by his Master's Committee.

Students are encouraged to propose programs which best suit their special interests, subject only to the following general requirements:

(1) Each candidate for the degree of Master of Science shall be required to demonstrate proficiency in independent design or research by successfully completing a master's thesis or project. Ordinarily this requirement is satisfied by completion of 4 to 12 credits in EGR 509. In special cases, a student may be exempted from EGR 509, but he must still satisfy the design-research requirement. In such cases the burden of proof of satisfaction of this requirement shall rest with the student, the manner of which is outlined in paragraph (3) below.

(2) It is required of each student taking EGR 509 to submit to his project director two copies of an engineering report describing all facets of the investigation. One copy shall remain with the project director; the other copy will be placed in a central file maintained by the Dean of the School of Engineering for perusal by any interested party. Detailed information concerning the format of the report is available in the Office of the School of Engineering. In addition, a project director will usually require a student to deliver a short oral presentation of his work before interested faculty and students.

(3) In some instances, a candidate may feel that he has already demonstrated proficiency in independent research or design at the master's level by virtue of a project completed previously while he was employed as a practicing engineer. Such a student should submit to his Master's Committee for its consideration a detailed report of the project, with reprints of any related publications. If the project was a joint effort, the report should clearly indicate the extent of the candidate's role in the undertaking. If the Master's Committee judges the effort to be of magnitude and at a level commensurate with standards set for work leading to the degree of Master of Science in engineering at Oakland University, it may then certify the candidate as having satisfied the design-research requirement. As an aid in its deliberations, the Committee may wish to request of the student additional substantiation of his case. (Graduate credit for project work is awarded only for participation in a

satisfactorily completed undertaking directed by a faculty member of Oakland University.)

(4) Of the 32 credits required for the degree, at least 20 must be earned in courses offered by the School of Engineering. Graduate credits are awarded only for courses numbered 500 and above.

(5) A student may request transfer credits, not to exceed 12 semester hours, for work done at another institution. A petition, endorsed by the Master's Committee, should be submitted to the Engineering Graduate Committee, and transcripts and catalog descriptions of the courses for which credit is requested should accompany the petition. In all cases, it shall be the responsibility of the candidate to demonstrate that the work done is relevant and complementary to his Oakland program.

(6) Full-time students may register for as many as 13 credits per semester, and students holding half-time assistantships in the School of Engineering may register for as many as 9 credits per semester. Students with high academic standing may be permitted to register for an additional course by special petition. (See paragraph 7 below.)

(7) In extraordinary cases, a student may petition to be relieved of a degree requirement. A petition form should be obtained from the Office of the Dean of the School of Engineering; it should then be presented to the Master's Committee for endorsement and submitted to the Engineering Graduate Committee for action.

THE DOCTOR OF PHILOSOPHY IN ENGINEERING

The School of Engineering offers work leading to the Doctor of Philosophy with a major in systems engineering. The goal of the doctoral program is to train engineering practitioners who have a broad competence that crosses the boundaries of traditional engineering disciplines and who are capable of dealing with such complex and urgent societal problems as the development of low-cost, mass-produced housing, urban mass transportation, regional planning, automotive and highway safety improvement, and health-care delivery. The field of systems engineering has evolved into a blending of disciplines that is well-suited for dealing with modern large-scale problems, and it is in this field that Oakland's School of Engineering is concentrating its efforts at the Ph.D. level. The Ph.D. program in systems engineering is specifically intended for students who plan careers in industrial or governmental research and development laboratories or problem-oriented agencies. Students can begin doctoral study on a part-time basis, availing themselves of late-afternoon or evening courses while maintaining full-time employment in local industry. However, later phases of study and research will require

full-time devotion to the program, and the student should plan to spend at least three semesters engaged in full-time study.

ADMISSION TO COURSE

The Ph.D. program is designed to accommodate students with academic backgrounds in engineering, mathematics or the physical sciences. A master's degree in any of these areas represents excellent preparation. Students with outstanding undergraduate records may apply directly for admission to the doctoral program, but normally a master's degree from an accredited institution is a requirement for admission. An applicant should present transcripts of all previous academic work and recommendations from three faculty members of his most recent study program who can evaluate his scholarly achievement and promise.

REQUIREMENTS FOR THE DEGREE

Students seeking the Ph.D. degree pursue a unified program of course study and thesis research. The entire program, including the specific array of courses taken by a particular student, is under the direction of a five-member Advisory Committee. This committee consists of four faculty members, one of whom represents a department outside the School of Engineering, and one thesis referee who must be from outside the Oakland University community. The Advisory Committee is chosen by the student with the approval of the Dean of Engineering and the Dean of Graduate Study, and must be formed during the student's first semester of enrollment. (The naming of the thesis referee may be postponed until the student registers for thesis research.)

The following general requirements apply to all candidates for the doctorate:

(1) Residence

Each candidate must devote a minimum of three semesters to full-time study. However, these semesters need not necessarily be consecutive or spent in residence on the campus. If the student's employer and faculty advisory committee are able to reach agreement that his thesis research will constitute his complete job assignment for a semester then, with the concurrence of the Dean of Engineering, that semester may be counted as spent in full-time study.

(2) Credit

A minimum of 56 credits must be earned for coursework beyond the bachelor's degree, the normal full-time load being 12 credits per semester. Students who have earned course credits in a master's degree program at Oakland or another university may petition to have these credits applied toward the 56. The student's Advisory Committee will evaluate his prior work and allow Ph.D. credits for those courses which are relevant to his proposed

Ph.D. course of study. In all instances, a candidate must complete at least 20 credits of coursework at Oakland University.

(3) Admission to Candidacy

By the time a student has attempted 12 credits of his Ph.D. program, he must apply for admission to degree candidacy. Acceptance into degree candidacy is by action of the School of Engineering faculty upon recommendation of the student's Advisory Committee. A student must take the written qualifying examination given by the School prior to applying for degree candidacy. His Advisory Committee will consider the results of this examination in its recommendation to the faculty.

(4) Qualifying Examination

A written Ph.D. qualifying examination will be administered once each semester. The examination will cover basic master's level material. Results of this examination will be transmitted to the student's Advisory Committee as an aid to its determination of his qualification to continue in a Ph.D. program. The Advisory Committee may ask a student to repeat the examination in a subsequent semester if his performance is deemed inadequate. (M.S. degree candidates may wish to take this examination prior to completing M.S. requirements; if so, they should first form a Ph.D. Advisory Committee.)

(5) Thesis

Each candidate will submit a thesis to his Advisory Committee. The thesis must be the candidate's own work, must constitute a contribution to the existing knowledge in his field of endeavor and must represent a practical solution to a real engineering problem. A rough draft of the thesis must be submitted to the Advisory Committee for its review, modification, and approval before the final copy of the thesis is prepared and approved.

(6) Thesis Proposal Review

As soon as a candidate has agreed with his Advisory Committee Chairman on a specific thesis research topic, he should prepare a written Thesis Proposal. This document should contain a formulation of the problem, the background work leading to the formulation and a plan of attack for the subsequent research. The candidate must then make an oral presentation of his proposal before his Advisory Committee and any other interested faculty, at which time the Committee may question him on his preparedness to carry out the research. Approval by the Advisory Committee of the Thesis Proposal permits the candidate to register for thesis research.

(7) Final Examination

Each Ph.D. degree candidate must satisfactorily defend his thesis in a final oral examination administered by the Advisory Committee. The examination is taken upon certification by the Advisory Committee that the thesis

is ready for final review. This examination is scheduled in advance, and any member of the University Faculty may attend and participate in the examination. The Committee may wish to invite additional outside referees to participate and is encouraged to do so. At the Committee's option, one re-examination may be permitted a candidate who fails to pass the final examination.

RESEARCH FACILITIES

The laboratories of Dodge Hall are excellently equipped for engineering research and design studies. Virtually all equipment is new and available for graduate student use. Established laboratories include: coherent optics, experimental stress analysis, heat transfer, system simulation, communications and control, mechanical and electrical properties of materials, and thin-film microelectronics. Special facilities exist for research in: two-phase flow phenomena, optical data-processing, holography, p-n junction devices, and large-scale systems analysis. All students have access to the IBM 1130 and 360/40 digital computing facilities as well as the several analog computers operated by the School. In addition, there is a large hybrid machine ideally suited to simulations of complex systems. All of these facilities are complemented by fully-equipped and staffed electronics and machine shops.

COURSE OFFERINGS

(One credit hour is equal to one semester hour.)

EGR 500 Graduate Seminar (1 credit)

Lecture and discussions conducted by members of the faculty, graduate students, and invited speakers from industry and other universities. Emphasis on current research interests of the School.

EGR 509 Engineering Design Project (4 to 12 credits)

A project requiring independent design effort by the student, with theoretical studies first and subsequently design of the appropriate hardware. Laboratory and computer studies will be included.

EGR 510 Introduction to Continuum Mechanics (4 credits)

Foundations in vector and tensor fields, kinematics of deformation, measures of strain and analysis of stress, equations of motion, compatibility conditions, constitutive equations, thermodynamics of deformation, infinitesimal elasticity, ideal fluids, ideal elasto-plasticity and linear viscoelasticity.

EGR 520 System Modeling and Analysis (4 credits)

A unified approach to the modeling of mechanical, electrical, thermal and fluid systems. Forms for multi-degree of freedom systems; analytical, numerical and analog computer solutions. The approximation of systems described by partial differential equations. Linearization, stability, controllability and observability.

EGR 521 Engineering Optimization (4 credits)

The optimization of functions and functionals. Maxima and minima of functions of one and several variables; constraints and Lagrange multipliers; parameter optimization; functionals under constraints and with bounded forcing—the Pontryagin Maximum principle; the gradient method.

EGR 530 Engineering Probability and Statistics (4 credits)

Fundamental probability and statistics with an introduction to stochastic processes. Applications to quality control, vehicular and telephone traffic, tolerancing, analysis of data, simulations with stochastic elements.

EGR 531 Operations Research (4 credits)

Deterministic and stochastic methods of operations research. Linear, non-linear, and dynamic programming, Markov processes, queuing theory, analysis of stochastic systems. Applications to allocation of resources, production and inventory scheduling and control, congestive systems, statistical tolerancing.

EGR 535 Large Scale Systems (4 credits)

System management, PERT, CPM, computer simulation and techniques such as game theory, queuing theory, traffic flow theory, etc. Each term a specific system study is conducted and major emphasis is on preparation of the report of this study.

EGR 540 Electromagnetic Signals and Waves (4 credits)

The electrostatic, magnetostatic, and electromagnetic field; electromagnetic waves, guided waves, radiation, diffraction theory.

EGR 548 Thermal Energy Transport (4 credits)

The basic concepts, properties, and descriptions of the three fundamental modes of heat transfer (conduction, convection, and thermal radiation); theoretical, numerical, and analog methods of analysis of steady, transient, single- and multi-dimensional problems.

EGR 549 Fluid Transport (4 credits)

A study of the fundamentals of fluid mechanics and their applications; potential flow of inviscid fluids, laminar and turbulent boundary layer theory compressible flow; similarity, modeling, and dimensional analysis.

EGR 550 Coherent Optics (4 credits)

Theory and design of optical data processing systems. Two-dimensional Fourier analysis; scalar diffraction theory; interference and partial coherence; Fourier transforming and imaging properties of lenses; analysis of coherent imaging systems; optical spatial filtering, holography.

EGR 551 Convective Transport Phenomena (4 credits)

The fundamental equations expressing conservation of mass, momentum, and charge; ideal and viscous fluids with mass transfer. Approximation techniques for solution of the conservation equations. Convective transfer of momentum, mass and charge; turbulent transport processes.

EGR 552 Thermal Transport Phenomena (4 credits)

The fundamental continuum equation expressing conservation of energy; radiation and conduction heat transfer; multi-dimensional and one-dimensional unsteady conduction problems. Forced and natural convective heat transfer; thermal boundary layer theory; two-phase flow.

EGR 555 Energy and Information Systems (4 credits)

Energy and entropy considerations of conservative and non-conservative systems; information and energy transfer in transducers and sensors. Modeling of thermodynamic systems. Availability analysis of energy conversion and transformation systems. Introductory irreversible thermodynamics.

EGR 561 Advanced Mechanics of Materials (4 credits)

Advanced topics in mechanics, such as beams on elastic foundations, curved and composite beams. Theory of plates and shells, torsion of non-circular cross-sections, thick-wall cylinders, contact stresses, stress concentrations. Energy methods and introduction to stability.

EGR 562 Mechanical Properties of Materials (4 credits)

True stress-strain properties of real materials with emphasis on defect structures in metals. Plastic deformation and fracture, dislocations, mechanical twinning and slip phenomena. Theories of yield strength, fracture and fatigue behavior. Work-hardening theories for metals, strengthening mechanisms in solids.

EGR 572 Electronic Properties of Materials (4 credits)

Crystal structure of important electronic materials, band theory of solids; transport phenomena; particle statistics; equilibrium distribution of carriers in semiconductors; electrical conductivity; optical and thermal effects in semiconductors; introduction to dielectric and magnetic properties.

EGR 573 Solid-State Electronic Devices (4 credits)

Non-equilibrium carrier densities, transport of excess carrier densities, p-n junctions and devices, interface studies, MOS structures, fundamentals of micro-electronics and integrated circuits. Fabrication of alloy junction, diffused junction and tunnel diodes, and thin semiconducting films.

56 — Admit no more than 3. Mechanic
Physics major good. Math and Chem
If they have no engineering background, need more
one sign of admission. say 90+ on GRE apt.

EGR 580 Numerical Methods in Engineering (4 credits)

Practical numerical methods in engineering with emphasis on techniques appropriate to digital computation. Roots of equations; interpolation; numerical integration and differentiation; linear equations and the eigenvalue problem; ordinary and partial differential equations.

EGR 581 Hybrid Computation and Simulation (4 credits)

Hybrid computing techniques for engineering problems. Parallel logic for iterative problems; analysis using z-transform; errors and compensation; split simulation and function generation. Applications to solution of partial differential equations, optimization and parameter identification.

EGR 585 Switching Theory (4 credits)

Algebraic symbolization for nets of binary switched circuits. Computation of nonredundant expansions by matrix methods with translation into laboratory devices using building-block computer elements. Introduction to sequential switching decomposition for control and programming of systems.

EGR 586 Computer Architecture (4 credits)

Models of information processors; computer logic and organization. Specification of instructions; addressing and format; time sharing controls; hardware for facilitating operating systems; micro-control; input/output and network interfacing.

EGR 609 Doctoral Thesis Research (4 to 12 credits)

Directed research toward the thesis.

Related Courses

MTH 531 Mathematical Methods in Engineering I (4 credits)

Vector spaces and matrices, eigenvalue problems, applications to systems of differential equations, numerical methods in linear algebra. Infinite series, Taylor's series, power series methods in differential equations.

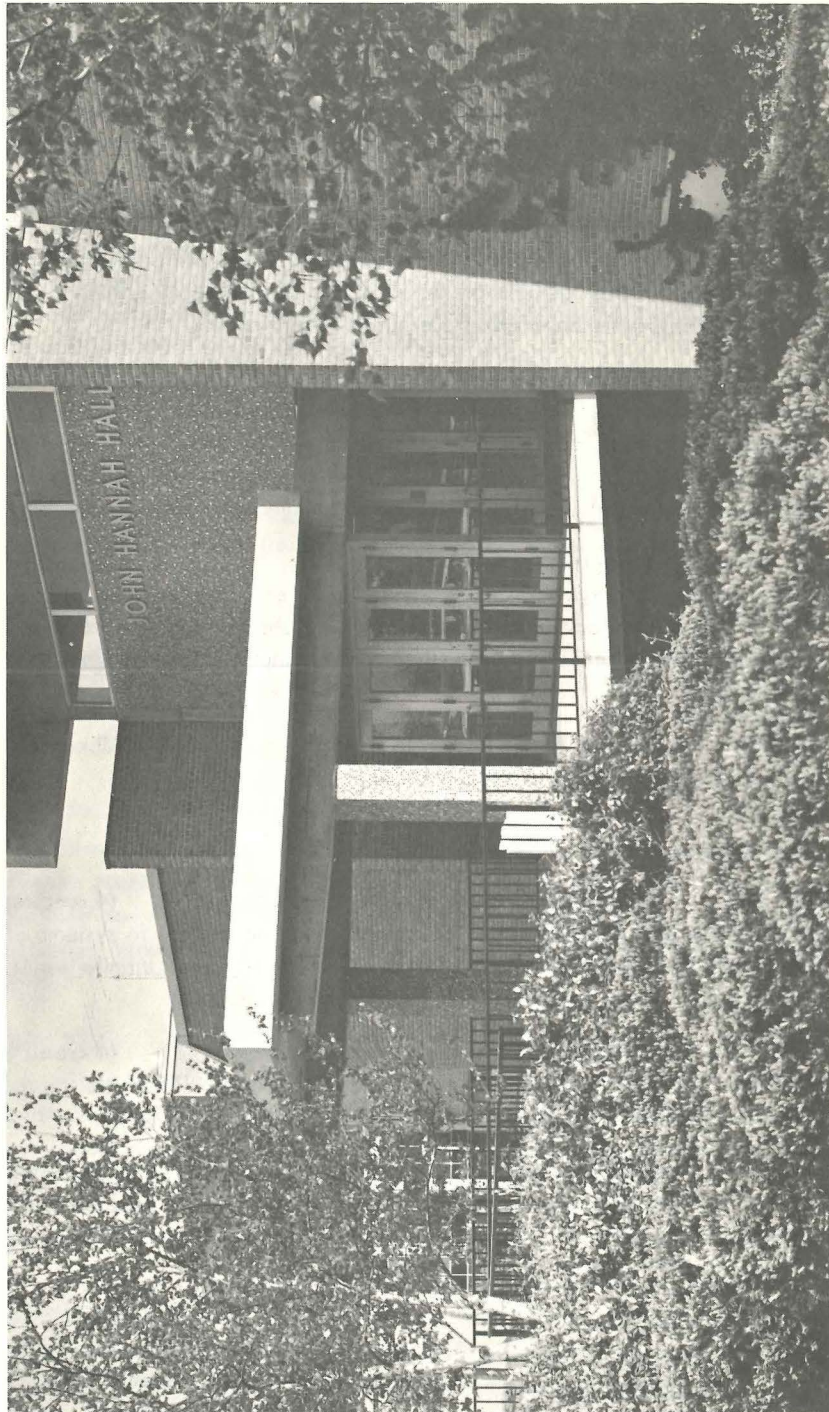
MTH 532 Mathematical Methods in Engineering II (4 credits)

Functions of several variables, vector field theory, partial differential equations, boundary value problems, Fourier series, and Fourier integrals.

EGR 582 Introduction to Computer Programming in PL/1 (4 credits)

Introductory computer programming in the PL/1 language. Intended expressly for teachers, emphasis is placed upon testing, bibliographic, and sorting applications. Not open to engineering students.

OK full
E.E.
ME
Industrial E
Mechanics
Civil related to transportation
but be careful
no
agony, soil Eng.
Construction Engin
Chem E.
No TOEFL under 550
83 90 for GRE quant.
Adv. GRE not used much
and not very good predictor.
— 57



ADMISSION, TRANSFER CREDIT, AND GRADING

REQUIREMENTS FOR ADMISSION

The graduate admissions policy of Oakland University is selective. Admission will be granted upon recommendation of the department or school concerned on the bases of the applicant's undergraduate record, letters of recommendation, and such other evidence as may be required by the department or school.

An applicant must have an acceptable baccalaureate or its equivalent from an accredited undergraduate institution. The degree should have been conferred within the past ten years; occasionally applicants with degrees awarded more than ten years ago will be admitted. Additional admissions information may be found in the various school and departmental program descriptions.

APPLICATION FOR ADMISSION BY FOREIGN STUDENTS

Foreign students should write to the Office of Graduate Study, Oakland University, Rochester, Michigan 48063, at least six months prior to the date they hope to enter the University. They will be sent instructions and application forms, which they should complete and return promptly. If their applications are approved, they will receive a certificate of admission to the University. Foreign students are normally required to submit scores from the Graduate Record Examination Aptitude Test prior to admission, and scores from one or more Advanced Tests of the Graduate Record Examination may be required in addition at the discretion of the department or school concerned. Scores from the Test of English as a Foreign Language or a comparable examination are also required.

Prior to a student's official registration, proof of adequate medical insurance must be on file in the University's Health Center.

ADMISSION TO COURSE

Admission to course is admission to a degree program. Degree program applicants must have official transcripts and letters of recommendation sent to the Office of Graduate Study.

READMISSION FEE

A student who has been admitted to course but has not been registered in any Oakland course or research activity for 12 months or more must apply for readmission. A fee of \$15, which is not refundable, will be assessed at that time.

TRANSFER OF CREDIT

Graduate students who wish to transfer credit from other colleges or universities must have such credit approved by their academic advisers and the Dean of Graduate Study. Applications should be filed as early as possible and, in any event, not later than the first week of the semester in which the student expects to graduate. Transfer of credit applications are available in the academic offices. A maximum of 12 semester hours (10 in the Department of Chemistry) will be accepted toward a graduate degree. One semester hour equals one credit hour. Conversely, 20 or 24 semester hours constitute the normal minimum residence requirement, depending on the number of hours required by the department or the school for a degree. After approval, transfer credit will be recorded on the student's official transcript in the Office of the Registrar.

SPECIAL GRADUATE STATUS

Special Graduate status may be granted by some departments to a student who wishes to take graduate courses but not to work toward a degree. An applicant wishing to strengthen course background prior to admission to a graduate degree program, or to work toward permanent teacher certification, may apply for admission under this status.

Credit earned under Special Graduate status will be officially recorded and may be applied toward degree requirements if a student later chooses to seek a degree and if the credit is appropriate to the degree objective. However, admission under Special Graduate status in no way implies admission to a degree program. A Special Graduate student who wishes to apply for admission to course must file a request for change of status with the Office of Graduate Study. Approval of this request is at the option of the academic department or school.

POST-BACCALAUREATE STATUS

Post-baccalaureate status may be granted applicants who have a baccalaureate degree from an accredited college or university and who wish to enroll in undergraduate courses, either to develop an additional major or to prepare for admission to a graduate program. Application for this type of admission should be made through the undergraduate admissions office.

ACADEMIC ADVISING

Every student admitted to a graduate degree program is assigned an adviser upon admission. The adviser will be a faculty member in the school or department in which the student is enrolled. Only those students enrolled in degree programs are assigned advisers, but students admitted under Special Graduate status are encouraged to contact the academic department concerned if advice regarding course selection is required.

PHYSICAL EXAMINATION

All graduate assistants and those graduate students who plan to take 10 or more credits in a semester are required to offer evidence of a physical examination. The physical examination form will be mailed to the applicant if admission is granted. The form must be completed and returned before registration.

COURSE NUMBERING SYSTEM

Courses numbered 100 to 299 are introductory or intermediate undergraduate courses. Courses numbered 300 to 499 are advanced courses primarily for undergraduates. Courses numbered 500 and above are primarily for graduate students. A department or school at its discretion may authorize or refuse to authorize graduate credit for any course numbered 300 to 499.

FINANCIAL AID

Oakland University seeks to make a variety of financial aids available to full-time graduate students. Teaching and research assistantships are awarded selectively at the discretion of the various departments and schools; graduate fellowships are awarded on a competitive basis to students nominated by the various academic departments and schools. Inquiries concerning other kinds of financial aid, such as National Defense Education Act Loans and employment under the College Work Study Program, should be directed to the Financial Aid Office following admission but as early as possible before registration.

A limited number of graduate assistantships are awarded to qualified students in the departments and schools of the University offering graduate programs. These assistantships are unrestricted as to citizenship; foreign students are therefore eligible to apply. Graduate students who receive assistantships may also be awarded fellowships. The 1972-73 stipends for graduate assistants range up to \$3,200 for two semesters, depending on the background of the student, the nature of the assignment and on the hours of work. Inquiries and applications for assistantships should be addressed to the chairman of the department or the dean of the school in which the assistantship is desired. Students must apply for admission to graduate study, however, before they can be considered for an assistantship.

COURSE FEES AND OTHER FEES

GENERAL POLICY

The Board of Trustees of Oakland University reserves the right to change any and all rates of charge at such times as conditions or circumstances may

make change necessary. All charges are assessed and payable in U.S. dollars. Checks and money orders should be made payable to Oakland University. To cover the cost of required expenses at registration, students are urged to use checks or money orders rather than cash. If those checks or money orders are in excess of the required payments, the balance will be paid to the student.

COURSE FEES

Course fees for each semester are assessed on the basis of the credit value of the courses taken. All course fees must be paid in full at registration. One credit hour is the equivalent of one semester hour.

Graduate course fees for Michigan residents are \$22.50 for each credit hour carried. The corresponding fee for nonresidents is \$49.00.

APPLICATION FEE

A fee of \$15 must accompany an application for admission. This is a processing fee and is not refundable.

LATE REGISTRATION FEE

Students registering or paying fees after the regular registration date are required to pay an additional, non-refundable fee of \$1 per credit hour on the first day and \$2 per credit hour on the second and subsequent days.

SPECIAL FEES

Graduate students who register for 10 or more credits are charged an additional \$11 (\$10 student center fee, and \$1 Wilson Memorial library fee). **Course fees and special fees must be paid in full at registration.**

PARKING FEE

Parking of automobiles on campus is regulated by the University's Department of Public Safety. The yearly parking fee is payable at the time of registration by those students who will find it necessary to park on campus before 4:30 p.m. For further information students should contact the Public Safety Office in the Gate House.

RESIDENT HOUSING: RESERVATIONS, DEPOSIT, FEES

Graduate students interested in University housing can procure information from the Director of Residence Halls, Oakland University. Requests for room reservations must be accompanied by a \$25 deposit, which is refundable up to July 1 if the University is notified. Room and board charges are \$613 per semester. An advance payment on room and board of \$100 will be due during the month of August. The balance of the room and board fee is due at

registration or may be paid in three installments, the first of which is due at registration. The second and third installments are due on the first day of the two months following registration.

OUT-OF-STATE TUITION RULES

1. A resident of Michigan (except for aliens) is defined as a person who has resided in this State for six months immediately preceding his or her first enrollment.
2. No one may gain or lose the status of a resident while a student at the University.
3. The residence of a minor shall be the same as that of his or her legal guardian except where guardianship has been established in this State for the purpose of evading the fee.
4. Aliens who have secured their Declaration of Intent papers and have otherwise met the residence requirements shall be considered residents.
5. The residence status of any person other than a parent or legal guardian who may furnish funds for the payment of University fees shall in no way affect the residence status of the student.

GRADING

To qualify for a master's degree a candidate must have earned an average of at least 3.0 in all courses taken at Oakland University as a graduate student. A grade of "S" (Satisfactory) is given in certain selected courses and is meant to imply 3.0 or better. This grade carries credit toward the degree but is not used in computation of the grade point average. A grade of "P" (Progress) is a temporary grade that may be given in a course that could not be completed in one semester. This grade is given only for work that is satisfactory in every respect and must be removed within two calendar years from the date of assignment. It must also be removed prior to graduation from the University.

APPLICATION FOR DEGREE

Students intending to graduate at the end of a semester must fill out an Application for Degree either when registering for the last semester or in the Office of the Registrar by the date indicated in the schedule for that semester. If candidate does not graduate in that semester, he must re-apply.

Kluden says there are strong in science technology

National Taiwan

National Chiao-Tung (?) Univ

An 80 average especially in technical subjects
from Nat Taiwan is a star.

