



OAKLAND UNIVERSITY
1970 GRADUATE BULLETIN 1971
ROCHESTER MICHIGAN

OFFICIAL PUBLICATIONS OF OAKLAND UNIVERSITY

Oakland University Undergraduate Programs

General Catalog published annually in July.

Oakland University Graduate Programs

Graduate Bulletin published annually in November.

Oakland University Summer School

Bulletin published annually in February.

Academy of Dramatic Art

Prospectus published annually in March.

Division of Continuing Education

Catalog published twice yearly in September and January.

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.

Admissions Information and Bulletins

Undergraduate Students—Director of Admissions

Graduate Students—Dean of Graduate Study

Academy of Dramatic Art—Administrative Director

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Director of Business Affairs

Career-oriented and Graduate Placement

Director, Placement Office

Continuing Education

Dean of Continuing Education

Educational Program, Transcripts, Academic Reports

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Graduate Students—Financial Aid Officer

Scholarships and Grants

New Students—Director of Admissions

Upperclassmen—Financial Aid Officer

Graduate Students—Dean of Graduate Study

Student Affairs and Services

Undergraduate Students—Vice Chancellor for Student Affairs

Graduate Students—Dean of Graduate Study

Student Housing

Director of Residence Halls

Telephone: Area Code 313 377-2000

OAKLAND UNIVERSITY

GRADUATE BULLETIN

1970-1971

Rochester, Michigan

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 ground of race, creed, color, or national origin.

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

November, 1969

Volume IV, No. 1

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UNIVERSITY CALENDAR

1969-1970

Fall Semester

September 3-5	Wednesday-Friday	Registration
September 8	Monday	Classes begin
November 27-30	Thursday-Sunday	Thanksgiving recess
December 1	Monday	Classes resume
December 12	Friday	Classes end
December 15	Monday	Final examinations begin
December 19	Friday	Final examinations end

Winter Semester

January 5, 6	Monday, Tuesday	Registration
January 7	Wednesday	Classes begin
March 5-8	Thursday-Sunday	Winter recess
March 9	Monday	Classes resume
April 14	Tuesday	Classes end
April 16	Thursday	Final examinations begin
April 21	Tuesday	Final examinations end
April 25	Saturday	Commencement

Spring Session

April 29	Wednesday	Registration
April 30	Thursday	Classes begin
May 29	Friday	Holiday
June 18	Thursday	Classes end
June 19, 20	Friday, Saturday	Final examinations

Summer Session

June 22	Monday	Registration
June 23	Tuesday	Classes begin
July 3	Friday	Holiday
August 11	Tuesday	Classes end
August 12, 13	Wednesday, Thursday	Final examinations

UNIVERSITY CALENDAR

1970-1971

Fall Semester

September 8, 9	Tuesday, Wednesday	Registration
September 10	Thursday	Classes begin
November 26-29	Thursday-Sunday	Thanksgiving recess
November 30	Monday	Classes resume
December 16	Wednesday	Classes end
December 17	Thursday	Final examinations begin
December 22	Tuesday	Final examinations end

Winter Semester

January 4, 5	Monday, Tuesday	Registration
January 6	Wednesday	Classes begin
March 4-7	Thursday-Sunday	Winter recess
March 8	Monday	Classes resume
April 15	Thursday	Classes end
April 16	Friday	Final examinations begin
April 21	Wednesday	Final examinations end
April 24	Saturday	Commencement

Spring Session

April 27	Tuesday	Registration
April 28	Wednesday	Classes begin
May 28	Friday	Holiday
June 17	Thursday	Classes end
June 18, 19	Friday, Saturday	Final examinations

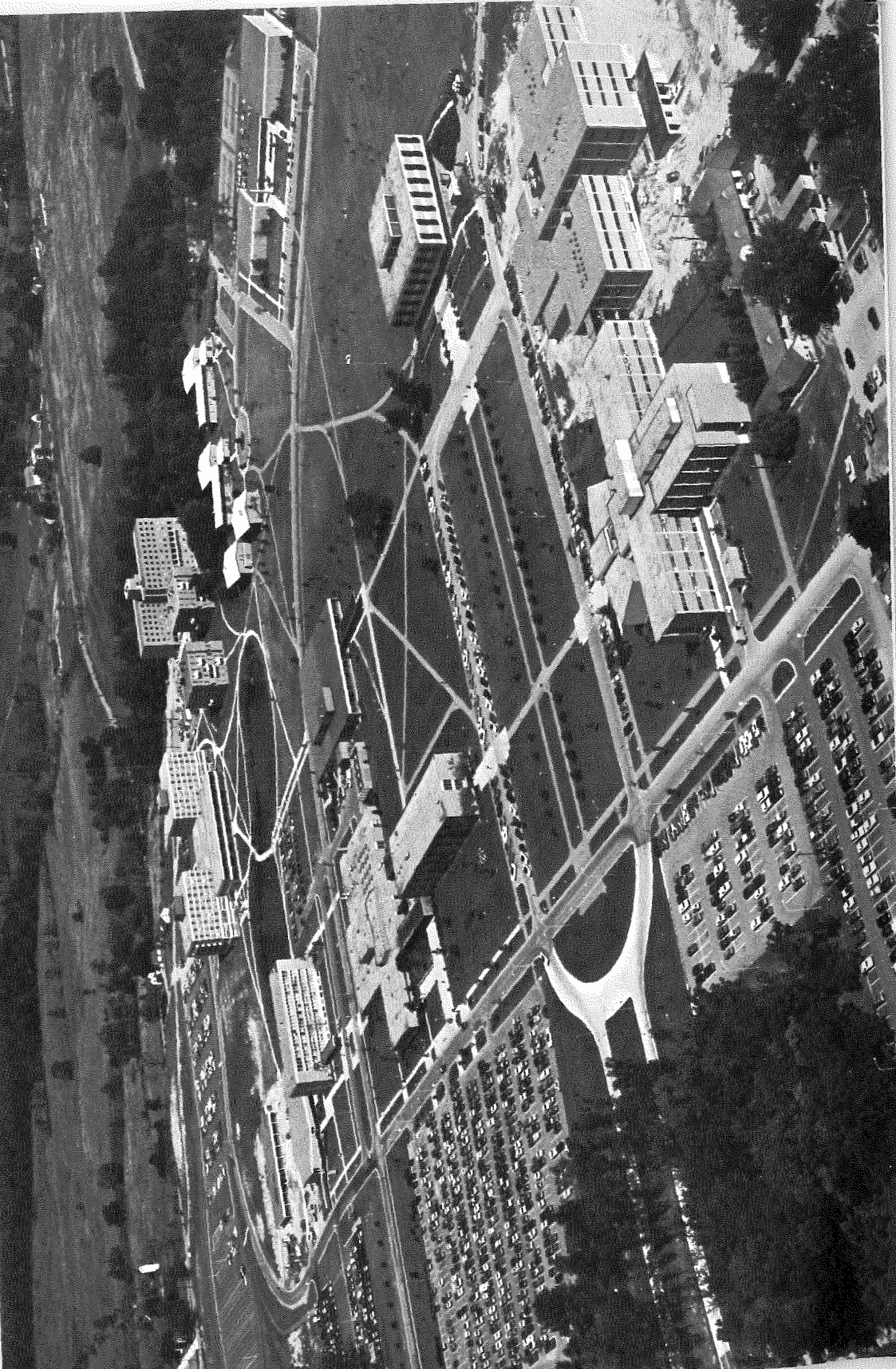
Summer Session

June 21	Monday	Registration
June 22	Tuesday	Classes begin
July 2	Friday	Holiday
August 11	Wednesday	Classes end
August 12, 13	Thursday, Friday	Final examinations

This calendar is subject to revision.

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An aerial photograph of the Oakland University campus, showing a large, modern building complex with multiple wings and a central courtyard. The campus is surrounded by trees and parking areas. The image is oriented vertically on the left side of the page.

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, and the School of Performing Arts. The Academy of Dramatic Art is an administrative unit of the School of Performing Arts. 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 the Master of Arts in Teaching in elementary education and in reading instruction. The College of Arts and Sciences and the School of Education jointly offer programs leading to the degree of the Master of Arts in Teaching in English and in mathematics. 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.

GOVERNANCE

Oakland University is affiliated with Michigan State University. Both institutions have the same President and Board of Trustees. The Board of Trustees is elected by the citizens of Michigan and has ultimate authority for the development and operation of both universities. Oakland has its own Chancellor and administrative officers. Since its founding it has been free to formulate its own policies, programs, and educational philosophy and to choose its own faculty and staff.

ACCREDITATION

The degree programs of Oakland University participated from its founding in the full accreditation status of the programs of Michigan State University. All baccalaureate programs of Oakland University were separately accredited by the North Central Association of Colleges and Secondary Schools in August, 1966. Preliminary accredita-

tion was granted by the same authority in 1967 for programs leading to the degrees of Master of Arts, Master of Arts in Teaching, and Master of Science.

HISTORY

Oakland University is located in Oakland County in the State of Michigan, twenty-five miles north of Detroit and midway between Rochester and Pontiac. University buildings are concentrated on the northwest corner of the 1,600-acre campus. Of this acreage, 1,400 acres comprised the Meadow Brook Farms estate of Mr. and Mrs. Alfred G. Wilson, given by them in 1957 to assist in the establishment of the University. On the estate are Meadow Brook Hall, formerly the Wilson home, and several other residences and farm buildings. Mr. and Mrs. Wilson also gave two million dollars to fund the University's first two academic buildings, North Foundation Hall and South Foundation Hall.

Chancellor Durward B. Varner and a charter faculty of twenty-five admitted the first class of 570 students in September, 1959. An enrollment of 7,000 students is projected for September, 1970. Expansion of the University's physical plant has paralleled this increase. Initially housed in the two Foundation Halls and the Oakland Center, the University now has twenty-one major buildings.

Baccalaureate degrees were first conferred by the University in April, 1963; and candidates for master's degrees were first admitted in the fall of 1965.

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 new 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, bio-chemistry, 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 new research resource of the University.

INSTITUTE OF BIOLOGICAL SCIENCES

The newly founded 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 will 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 will draw 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 edu-

cational 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. Half of the laboratory is used by Gifford G. Scott of the General Motors Research Laboratory for his 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.

KRESGE LIBRARY

All Oakland University library collections and services are centralized in Kresge Library, an open-stack facility. The Library presently contains approximately 165,000 volumes. The development of collections has been carefully planned to support undergraduate curricula of high quality. Now under way is a drive to build research strength for ten graduate programs. The Matilda R. Wilson Memorial Collection of reference and bibliographic works, funded by student gifts, constitutes a major addition to library holdings and affords a substantial research facility for faculty and students. Among other special collections recently initiated is the Martin Luther King, Jr. Memorial Collection of materials related to black culture in America.

The Library offers a variety of services to the user. Service points include: the listening center, a versatile audio system; a microform reading room; the documents room, which houses archives and government publications and is a partial depository for documents issued by the United States government and by the State of Michigan; the science area, a concentration of monographs, indexes, and abstracts in this broad subject field; a general reference department; and the circulation department, which has an automated circulation system.

The reference department administers an interlibrary loan service through which faculty and graduate students may borrow books and request photo-duplication of periodical literature not available in Kresge Library. For this purpose the Library maintains a rapid shuttle service between itself and the very large research library of the University of Michigan. Graduate students and faculty may also arrange to borrow

books directly or by shuttle service from the extensive libraries of Michigan State University.

THE LEARNING STRATEGY CENTER

The Learning Strategy Center is a new 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 the already skillful student in improving himself further. The Reading Center also functions as a laboratory for research and training in the field of reading improvement.

RESEARCH FACILITIES DESCRIBED ELSEWHERE 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. (See pp. 26-27, p. 42 and p. 63.

CAMPUS BUILDINGS

North Foundation Hall (1959)

Gift of Mr. and Mrs. Alfred G. Wilson. Administrative offices; University services; classrooms; Office of the Dean, School of Economics and Management; faculty offices (Economics, Economics and Management, and Political Science).

South Foundation Hall (1959)

Gift of Mr. and Mrs. Alfred G. Wilson. Classrooms; faculty offices (Music, Division of Continuing Education).

Oakland Center (1959)

Self-liquidating funds. Student activities; University Book Center; meeting rooms; food services; cleaners; barber. (Addition costing two million dollars to be completed in December, 1969.)

Kresge Library (1961)

Gift of the Kresge Foundation. All library collections, offices, and services; Instructional Materials Center.

John A. Hannah Hall of Science (1961)

Funds appropriated by the State of Michigan. Classrooms; laboratories; Office of the Associate Dean, School of Performing Arts; faculty offices (Chemistry, Mathematics, Physics, Psychology).

Intramural Sports and Recreation Building (1963)

Self-liquidating funds. Athletic offices; gymnasium; swimming pool; rehearsal rooms of the Academy of Dramatic Art.

Charles F. Kettering Magnetics Laboratory (1963)

Gift of the Kettering Foundation. Facilities of the Magnetics Laboratory.

Howard C. Baldwin Memorial Pavilion (1964)

Gifts from multiple foundation and other private sources. Roofed pavilion; site of the Meadow Brook Music Festival.

Lulu B. Wilson Memorial Concert Shell (1964)

Gift of the Lulu B. Wilson Trust. Acoustical shell at the Baldwin Pavilion.

Trumbull Terrace (1965)

Gift of Mr. and Mrs. George T. Trumbull. Patio; food and service facilities for the Baldwin Pavilion; summer quarters of the Scholar Shop.

Matilda R. Wilson Hall (1966)

Funds appropriated by the State of Michigan. Classrooms; language laboratory; John Fernald Company; Meadow Brook Theatre; University Art Gallery; Admissions Office; Housing Office; Placement Office; Office of the Dean of Students; faculty offices (Academy of Dramatic Art, Art, English Language and Literature, History, Modern Languages and and Literatures, Philosophy).

Dodge Hall of Engineering (1968)

Funds appropriated by the State of Michigan and federal grants. Classrooms; laboratories; research facilities; Computing and Data Processing Center; Institute of Biological Sciences; Office of Research Services; Office of Graduate Study; Office of the Dean, School of Engineering; Office of the Dean, School of Education; Office of the Dean, Summer School; faculty offices (Allport College, Biological Sciences, Classical Languages and Literatures, Education, Engineering, Speech).

Graham Health Center (1968)

Self-liquidating funds. Health offices and services; Office of the Dean, College of Arts and Sciences; Office of the Dean of Freshmen; Advising and Orientation Offices; Office of the Director of Special Projects.

New Classroom-Office Building

(To be opened September, 1970.) Funds appropriated by the State of Michigan and a federal grant.

Meadow Brook Hall

Gift of Mr. and Mrs. Alfred G. Wilson.

RESIDENCE HALLS

Fitzgerald House (1962)

Gift of Mr. and Mrs. Harold A. Fitzgerald, and self-liquidating funds.

Anibal House (1962)

Gift of Mr. and Mrs. B. H. Anibal, and self-liquidating funds.

Pryale House (1963)

Gift of Mr. and Mrs. Harry M. Pryale, and self-liquidating funds.

Hill House (1964)

Gift of Mr. O. E. Hunt. Faculty offices (Sociology and Anthropology).

Van Wagoner Hall (1965)

Self-liquidating funds.

Vandenberg Hall (1966)

Self-liquidating funds. Classrooms; faculty offices (Charter College, New College).

Hamlin Hall (1968)

Self-liquidating funds. Classrooms.

THE FACULTY OF THE GRADUATE PROGRAMS

DONALD D. O'DOWD Ph.D., Harvard University	Chancellor Provost and Dean of Graduate Study
HARVEY J. ARNOLD Ph.D., Princeton University	Associate Professor of Mathematics
EDWARD A. BANTEL Ed.D., Columbia University	Professor of Education and Psychology
DAVID C. BEARDSLEE Ph.D., University of Michigan	Professor of Psychology Director of Institutional Research
PETER C. BERTELSON D.Sc., Washington University	Visiting Professor of Engineering
JOHN G. BLAIR Ph.D., Brown University	Associate Professor of English
ROBERT N. BLOCKOVICH Ph.D., Wayne State University	Assistant Professor of Psychology
DAVID E. BODDY Ph.D., Purdue University	Assistant Professor of Engineering
LOUIS R. BRAGG Ph.D., University of Wisconsin	Professor of Mathematics
MICHAEL BRAND Ph.D., Purdue University	Assistant Professor of Mathematics
JEAN S. BRAUN Ph.D., Wayne State University	Associate Professor of Psychology
DAVID C. BRICKER Ph.D., Johns Hopkins University	Assistant Professor of Education
GOTTFRIED BRIEGER Ph.D., University of Wisconsin	Associate Professor of Chemistry
MAX BRILL Ph.D., University of Cincinnati	Assistant Professor of Psychology
MARC E. BRIOD Ph.D., Northwestern University	Assistant Professor of Education
CHARLES M. BROH Ph.D., Case Western Reserve University	Assistant Professor of English
MAURICE F. BROWN Ph.D., Harvard University	Professor of English
HARVEY BURDICK Ph.D., University of Minnesota	Professor of Psychology

HAROLD C. CAFONE Ed.D., University of Arizona	Associate Professor of Education
PHEBE CHAO M.A., University of Michigan	Special Instructor in English
MELVIN CHERNO Ph.D., Stanford University	Professor of History Chairman, New College
BENJAMIN F. CHEYDLEUR B.A., University of Wisconsin	Professor of Engineering Director of Computing and Data Processing Center
J. CURTIS CHIPMAN Ph.D., Dartmouth College	Assistant Professor of Mathematics
F. JAMES CLATWORTHY M.A., University of Michigan	Instructor in Education
KENNETH H. COFFMAN Ph.D., Northwestern University	Associate Professor of Psychology Director of Psychological Services
KENNETH R. CONKLIN Ph.D., University of Illinois	Assistant Professor of Education
GEORGE E. COON Ed.D., Wayne State University	Professor of Education
RONALD L. CRAMER Ph.D., University of Delaware	Assistant Professor of Education
JAMES E. DAVIS Ph.D., Massachusetts Institute of Technology	Assistant Professor of Chemistry Assistant Provost
JOSEPH W. DeMENT Ph.D., Indiana University	Associate Professor of English
JOHN W. DETTMAN Ph.D., Carnegie Institute of Technology	Professor of Mathematics
RONALD A. DeVORE Ph.D., Ohio State University	Assistant Professor of Mathematics
JANE DONAHUE Ph.D., Brown University	Assistant Professor of English
ROBERT L. DONALD M.A., University of Detroit	Instructor in English
JOSEPH S. DUMAS B.A., Boston College	Assistant Professor of Psychology
ROBERT T. EBERWEIN Ph.D., Wayne State University	Assistant Professor of English
ROBERT H. EDGERTON Ph.D., Cornell University	Associate Professor of Engineering
DAVID H. EVANS Ph.D., Brown University	Visiting Professor of Engineering

PETER G. EVARTS M.A., University of Michigan	Associate Professor of English
GEORGE F. FEEMAN Ph.D., Lehigh University	Professor of Mathematics
THOMAS FITZSIMMONS M.A., Columbia University	Professor of English
WILLIAM C. FORBES Ed.D., Columbia University; Ph.D., University of Connecticut	Professor of Biological Sciences
JON FROEMKE Ph.D., University of California (Berkeley)	Assistant Professor of Mathematics
DANIEL H. FULLMER Ph.D., University of Michigan	Assistant Professor of Linguistics and English
JULIEN GENDELL Ph.D., Cornell University	Associate Professor of Chemistry
JOHN E. GIBSON Ph.D., Yale University	Professor of Engineering Dean, School of Engineering
HAROLD GORVINE Ph.D., Harvard University	Associate Professor of History
SIDNEY W. GRABER Ed.D., Wayne State University	Assistant Professor of Education
JEFFREY A. GREENHOUSE Ph.D., University of California (Berkeley)	Assistant Professor of Chemistry
HARRY T. HAHN Ed.D., Temple University	Professor of Education
WILLIAM G. HAMMERLE Ph.D., Princeton University	Professor of Engineering
NIGEL HAMPTON M.A., University of Connecticut	Instructor in English
KENNETH M. HARMON Ph.D., University of Washington	Professor of Chemistry
RICHARD E. HASKELL Ph.D., Rensselaer Polytechnic Institute	Associate Professor of Engineering
ROBERT G. HEEREN Ph.D., University of Illinois	Assistant Professor of Engineering
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DONALD C. HILDUM Ph.D., Harvard University	Professor of Psychology Acting Chairman, Department of Psychology

J. CARROLL HILL Ph.D., Purdue University	Professor of Engineering
WILLIAM C. HOFFMAN Ph.D., University of California (Los Angeles)	Professor of Mathematics
ROBERT HOOPES Ph.D., Harvard University; D. Litt. (Hon.) Cornell College	Professor of English Chairman, Department of English
ALBERT F. HOUCHENS M.S.M.E., University of Illinois	Instructor in Engineering
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KEITH R. KLECKNER Ph.D., Cornell University	Associate Professor of Engineering Assistant Dean, School of Engineering
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CARMINE ROCCO LINSALATA Ph.D., University of Texas	Professor of Spanish
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DAVID G. LOWY Ph.D., University of Tennessee	Associate Professor of Psychology
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DONALD G. MALM Ph.D., Brown University	Associate Professor of Mathematics

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JOHN M. MCKINLEY Ph.D., University of Illinois	Associate Professor of Physics
LORNA MIDDENDORF M.A., University of Chicago	Instructor in Psychology
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RALPH C. MOBLEY Ph.D., University of Wisconsin	Professor of Physics Chairman, Department of Physics
JACK R. MOELLER Ph.D., Princeton University	Associate Professor of German
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Associate Professor of English

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Ph.D., University of Wisconsin

Professor of Physics

HOWARD R. WITT
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Associate Professor of Engineering
Assistant Dean, School of Engineering

YEL CHIANG WU
Ph.D., Cornell University

Assistant Professor of Mathematics

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George T. Matthews

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Paul Tomboulia

Reuben Torch

Gilbert L. Wedekind

Chancellor
Provost and Dean of Graduate Study

Professor of History
University Librarian
Professor of Bibliography

Assistant Professor of Education
Associate Professor of English

Professor of Mathematics
Professor of Engineering
Dean, School of Engineering

Assistant Professor of Education
Associate Professor of Engineering
Professor of Education

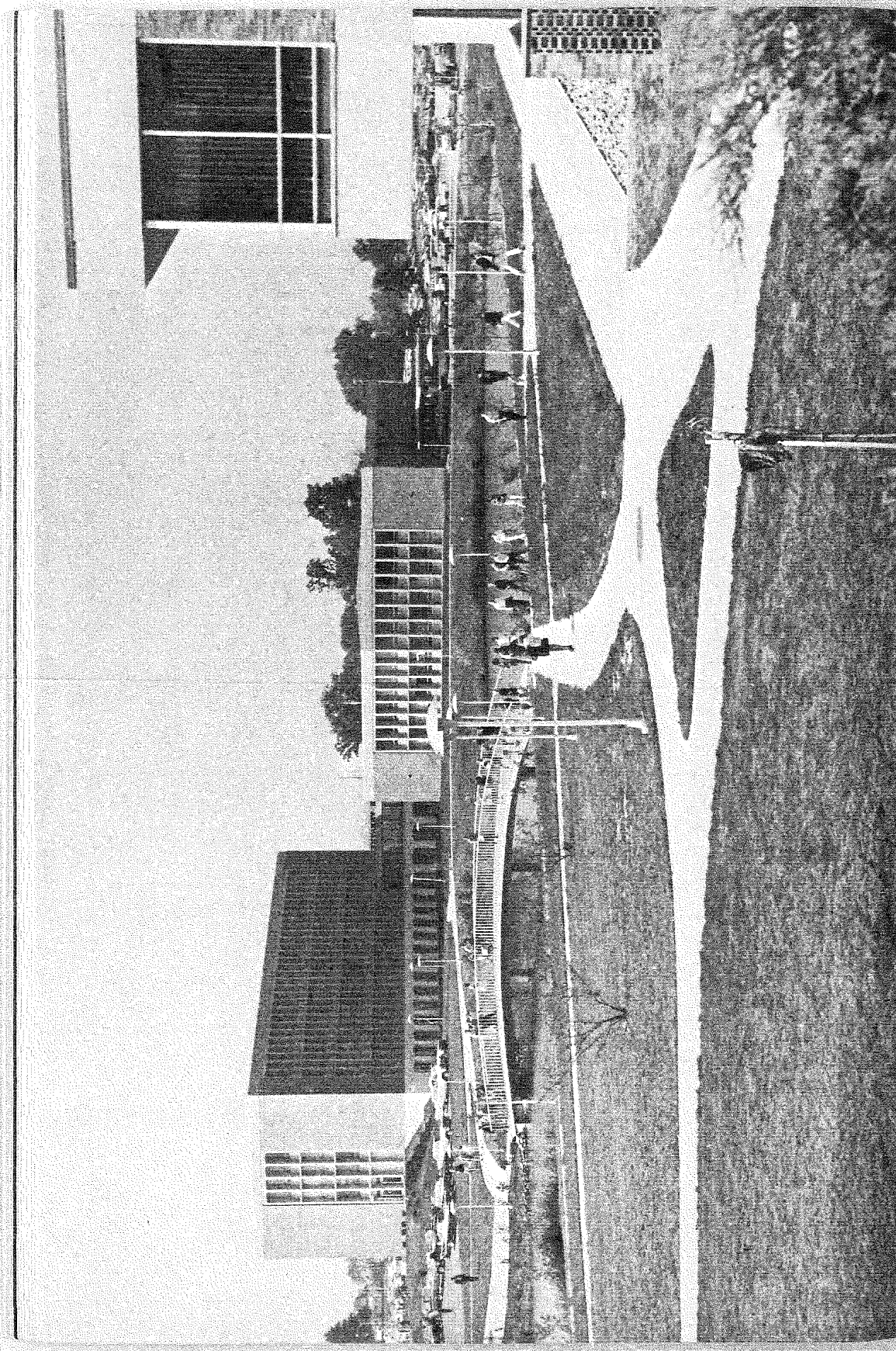
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Professor of History
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Associate Professor of Physics
Associate Professor of Education
Associate Dean, School of Education

Professor of Chemistry
Chairman, Department of Chemistry
Professor of Biological Sciences

Associate Dean, College of Arts and Sciences
Associate Professor of Engineering



COLLEGE OF ARTS AND SCIENCES

George T. Matthews, Dean
Reuben Torch, Associate Dean

DEPARTMENT OF CHEMISTRY

Professors: Paul Tombouliau, Chairman
Kenneth M. Harmon

Associate Professors: Gottfried Brieger
Julien Gendell
Steven R. Miller
Frederick W. Obear
Robert L. Stern
Anthony L. Van Geet

Assistant Professors: James E. Davis
Jeffrey A. Greenhouse
Joel W. Russell

THE MASTER OF SCIENCE IN CHEMISTRY

The program leading to the degree of Master of Science in chemistry 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. The program is arranged so that the well-prepared full-time student should be able to finish in one calendar year (including the Spring and Summer Sessions). All graduate students must receive approval of the departmental graduate program adviser before enrolling in courses.

Teaching Assistantships

Teaching assistantships are available in varying amounts for full-time graduate students. The awarding of assistantships is at the discretion of the Department. In 1969-70 an assistantship requiring twelve hours of work a week for two semesters paid \$2,500. In 1970-71 this stipend is expected to be somewhat higher. Out-of-state tuition is waived for non-resident assistants. Support beyond two semesters is available on a selective basis. In some cases, full remission of tuition may be granted in addition to the stipend.

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. He 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 educational background. The Graduate Record Examination may be required.

Any of the above requirements may be waived by the Department.

Requirements for the Degree

The candidate for the degree of Master of Science in chemistry must complete the following minimum requirements: 30 credits in courses carrying graduate credit, of which 24 credits must be in chemistry. Of these 24 credits, 16 must be from four of the following areas: biochemistry, inorganic chemistry, organic chemistry, physical chemistry, and analytical chemistry. Of the remaining 8 credits in chemistry, a minimum of 6 credits must be in CHM 690. The candidate must have demonstrated accomplishment or made satisfactory progress in research and must present a master's thesis. He must pass a final master's examination, and he must demonstrate reading proficiency in a foreign language.

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: coordination compounds of cobalt, x-ray crystallography of boron hydrides, organolithium condensation reactions, high-resolution infrared spectroscopy, replication mechanisms in viral DNA, ammonia-hydrazine solution dynamics, photochemistry of terpenes, insect lipid metabolism, stereochemistry of hindered aromatic systems, kinetics of azine pyrolyses, normal coordinate analysis of small-ring systems, chromatographic separations of diastereomers, spectroscopic instrumentation.

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, radio-chemical counting equipment, low-energy beta-ray counter, polarographic and automatic titration equipment, spinning-band fractionating columns, a variety of visible and ultraviolet spectrophotometers, an ultracentrifuge, fluorometric equipment, and a large amount of electronic instru-

mentation. Nearby facilities include two digital computers, electron microscope, helium leak detector, and liquid scintillation counter.

COURSE OFFERINGS

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

CHM 312 Inorganic Chemistry (4 credits)

Development of atomic theory, chemical periodicity, molecular structure, and chemical properties of selected inorganic compounds.

Prerequisite: CHM 244.

Prerequisite or corequisite: CHM 245.

CHM 317 Inorganic Chemistry Laboratory (1 credit)

Advanced preparatory techniques; methods of purification and analysis.

Prerequisite or corequisite: CHM 312.

CHM 324 Analytical Chemistry (2 credits)

Advanced quantitative techniques and measurements; theory and application of modern analytical methods.

Prerequisites or corequisites: CHM 237, CHM 245, PHY 152.

CHM 328 Analytical Chemistry Laboratory (2 credits)

Laboratory coordinated with CHM 324.

Corequisite: CHM 324.

CHM 346 Spectroscopy Laboratory (4 credits)

Experimental techniques of spectroscopy: infrared, ultraviolet, nuclear magnetic resonance, and mass spectrometry. Instrument design and performance, sampling methods, and applications are examined.

Prerequisite or corequisite: CHM 245.

CHM 351 Biochemistry (4 credits)

An introduction to molecular biology and the chemistry of biological macromolecules; proteins and nucleic acids, enzymology, bio-energetics, and metabolic cycles.

Prerequisite: CHM 234.

CHM 357 Biochemistry Laboratory (1 credit)

Prerequisite or corequisite: CHM 351.

CHM 387 Advanced Preparations (2 credits)

Specialized laboratory work in selected areas emphasizing advanced techniques.

Prerequisite: Permission of the Department.

CHM 400 Seminar (1 credit)

Regularly scheduled discussions of all fields of current interest in chemistry; presented by students, faculty, and visitors.

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 stand-

point 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.

Prerequisites: CHM 238, 248, 328; PHY 158.

CHM 431 Organic Synthesis (4 credits)

Theory and practice of synthetic and degradative methods of organic chemistry. Preparative reactions from the recent chemical literature will be emphasized.

Prerequisites: CHM 235, 245.

CHM 433 Organic Mechanisms (4 credits)

Application of modern electronic theory to the structures and reactions of organic compounds.

Prerequisites: CHM 235, 245.

CHM 434 Natural Products (4 credits)

The application of modern synthetic and analytical methods in selected areas of natural product chemistry.

Prerequisites: CHM 235, 245.

CHM 442 Kinetics (4 credits)

Kinetic theory of gases, equilibrium and transport properties of gases, intermolecular forces, collision theory of reaction rates, mechanism of reactions, homogeneous catalysis, transition-state theory, absolute rate theories, surface reactions, and photoreactions.

Prerequisite: CHM 245.

CHM 444 Quantum Chemistry (4 credits)

Lagrangian and Hamiltonian mechanics, derivation of quantization for simple systems, approximate methods for solution of more complex systems, angular momentum, molecular orbital and valence bond theory, and interpretation of molecular electronic spectra.

Prerequisites: CHM 245, PHY 371, MTH 254.

CHM 452 Advanced Biochemistry (4 credits)

A continuation of CHM 351, but more chemical in emphasis. Devoted primarily to metabolism and cellular regulation.

Prerequisite: CHM 351.

CHM 490 Research (2, 4, 6, or 8 credits)

Laboratory and library practice in undergraduate research.

Prerequisite: Permission of the Department.

CHM 514 Topics in Inorganic Chemistry (4 credits)

Discussion of areas of current interest in inorganic chemistry.

Prerequisite: CHM 413.

CHM 543 Statistical Thermodynamics (4 credits)

The statistical basis of thermodynamics, ensembles, partition functions, and

distribution functions; classical and quantum statistical mechanics; applications to simple physical and chemical systems.

Prerequisites: CHM 245, PHY 152, MTH 254.

CHM 545 Quantum Chemistry (4 credits)

The quantum mechanics of molecular energies and structure will be presented, and the interpretation of infrared, Raman, nuclear magnetic resonance, electron spin resonance, and other spectra will be discussed. Applications of spectroscopy to problems of molecular structure, intermolecular forces, and chemical reactions may be studied.

Prerequisite: CHM 444.

CHM 553 Genetic Biochemistry (4 credits)

The biochemical basis of heredity; genetic and biochemical functions of DNA, RNA, and proteins; genetic control of cell biochemistry; biochemical genetics.

Prerequisite: CHM 452.

CHM 690 Research (2, 4, 6, 8, 10, or 12 credits)

Graduate research and study under the supervision of a faculty member.

Prerequisite: Permission of the Department.

DEPARTMENT OF ENGLISH LANGUAGE AND LITERATURE

Professors:	Robert Hoopes, Chairman Maurice F. Brown Thomas Fitzsimmons William Schwab Gertrude M. White, Associate Chairman
Associate Professors:	John G. Blair Joseph W. DeMent Peter G. Evarts, Associate Chairman James F. Hoyle Richard S. Lyons Donald E. Morse Marilyn L. Williamson
Assistant Professors:	Charles M. Broh Jane Donahue Robert T. Eberwein Daniel H. Fullmer David W. Mascitelli
Instructors:	Robert L. Donald Nigel Hampton Brian F. Murphy Helen J. Schwartz
Special Instructor:	Phebe Chao

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 Department of English 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 a student of specially recommended ability, but with insufficient background — in extent or balance of previous studies — is admitted, he will be advised concerning improvement of his preparation and will usually be asked to take an appropriate number of departmental undergraduate courses before commencing graduate work. His degree program, 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.

READMISSION

A graduate student in English whose registration is interrupted for one or more semesters (excluding the Spring or Summer Session) may be readmitted only with the permission of the Department of English. Such readmission must be processed through the Office of Graduate Study at least one month prior to the date of re-entry.

TRANSFER CREDIT

Students who have completed graduate work in degree programs elsewhere within the last five years may petition the Graduate Programs Committee for the evaluation of such credits. Such a petition should be made as early as possible in the student's program and must be made before he has completed 12 credit hours at Oakland University. Final granting of transfer credit is contingent upon acceptance to degree candidacy. M.A.T. candidates desiring credit for education courses which might fulfill M.A.T. requirements must make their petitions to the School of Education. Up to 12 transfer credits may be accepted.

TEACHING ASSISTANTSHIPS

Teaching assistantships are available to students in either the M.A. or M.A.T. program, competitively, with stipend. An assistant is assigned to a senior faculty member, with duties that characteristically involve reading and grading undergraduate papers and examinations, holding student conferences, presenting an occasional classroom lecture — as these tasks may be delegated by the supervising professor. He may also (or instead) be asked to provide research assistance to a professor, and thereby be afforded opportunity to advance his learning beyond the limits of course work.

In 1969-70 an assistantship carried a stipend of \$2,500 for two semesters and required an average of ten to twelve hours of service per week. The stipend is expected to be somewhat higher in 1970-71.

A graduate student appointed assistant may register for 8 credits (two courses) per semester. Only students who can give full time to the combination of assisting and course work are eligible to apply. Renewal of an assistantship semester by semester is contingent upon satisfactory progress toward the degree. In a limited number of cases, full tuition remission may be granted along with the assistantship. Out-of-state tuition is waived for graduate students holding assistantships.

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 the student interested in increasing his proficiency in the study of English and American language and literature. Upon completion of the program, candidates may continue work toward the Ph.D. at another institution, or find the master's degree work useful in teaching and other professional activities.

Requirements for the Degree

Nine courses (36 credits) are required, three of which are specified: ENG 690 and two graduate seminars in English. The six 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 his 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. They will not be accepted to degree candidacy or allowed to continue course work beyond 12 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 the structure and history of the English language on the graduate level.

Admission to Course

Any student duly admitted into the M.A. program may, in consultation with his adviser, 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: the two undergraduate courses from the above list (ENG 376, 377, 382) which were not taken as prerequisite; 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 M.A. language requirement described on p. 32 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 addresses itself to the same ends as those of the program leading to the degree of Master of Arts in English, but 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 Department of English and the School of Education.

Requirements for the Degree

Nine courses (36 credits) are required, five of which are specified: ENG 510, ENG 690, one graduate seminar in English; one course chosen from the following group of four alternates: ED 601, ED 602, ED 603, or ED 604; and one course chosen from the following group of two: PSY 510 or PSY 520. The remaining four courses in English are to be chosen in consultation with the student's program adviser.

TYPICAL PROGRAMS

Master of Arts in English

- Semester 1: ENG 300-level course
ENG 500-level core course
ENG 500-level core course
- Semester 2: ENG 300-level course
ENG 500-level core course
ENG 600-level seminar
- Semester 3: ENG 500-level core course or cognate
ENG 600-level seminar
ENG 690 The Master's Project

Master of Arts with English Language Concentration

- Semester 1: ENG 376, 377, or 382
ENG 531, 532, or 533
ENG 531, 532, or 533
- Semester 2: ENG 376, 377, or 382

Semester 3: ENG 531, 532, or 533
ENG 647 Studies in the Structure of English
ENG 690 The Master's Project

Semester 1: ENG 300-level course
ENG 500-level core course
One of ED 601, ED 602, ED 603, or ED 604

Semester 2: ENG 510 (departmental requirement)
ENG 500-level core course
PSY 510 or PSY 520

Semester 3: ENG 500-level core course
ENG 600-level seminar
ENG 690 The Master's Project

The graduate programs of the Department of English offer three kinds of courses:

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 the student to take seminars in areas of language and literature with which he is not familiar. 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.

Core courses are designed to familiarize the student with principal approaches to language and literature and to 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.)

(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 stu-

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. Upon acceptance of a proposal, the Department Committee on Graduate Programs will appoint a faculty member to supervise and evaluate the undertaking. An application form for ENG 690 is available in the Department office. It must be used by the student in submitting a conspectus of his project and seeking approval to proceed.

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

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

Special topics and problems as selected by the instructor. (Not a core course.)

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. Open to M.A. candidates for credit only in lieu of a cognate. (Not a core course.)

The study of a single literary kind, whether genre (such as novel, lyric, or drama) or mode (such as tragedy or comedy) in an attempt to discover similarities and differences among individual works studied, as well as to relate the kind under discussion to the body of literature as a whole.

Through the examination of one literary period, the student will be made aware of the multiple interconnections among works, using such concepts as "school," "influence," "cultural movement," "history of ideas," and "social change."

The aims of the course are to give the student a sense of the relationship of the work to its human context as well as to place it in a proper historical perspective.

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 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 Eighteenth Century Literature (4 credits)

ENG 645 Studies in Nineteenth 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. For Master of Arts in Teaching candidates, permission of the School of Education.

DEPARTMENT OF MATHEMATICS

Professors: G. Philip Johnson, Chairman
Louis R. Bragg
John W. Dettman
George F. Feeman
William C. Hoffman
James H. McKay

Associate Professors: Harvey J. Arnold
Donald G. Malm
Harvey A. Smith
Beauregard Stubblefield

Assistant Professors: Michael Brand
J. Curtis Chipman
Ronald A. DeVore
Jon Froemke
C. Peter Lawes
Louis J. Nachman
Irwin Schochetman
Yel Chiang Wu

Instructor: Steven J. Takiff

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 Department of Mathematics and the School of Education.

THE MASTER OF ARTS IN MATHEMATICS

The curriculum leading to the degree of Master of Arts in mathematics is designed primarily to be the first part of a doctoral program. Nearly half of the program's graduates to date have transferred to other universities to continue work for the degree of Doctor of Philosophy. Of the remainder, who have gone to positions in teaching, government, or industry or have entered the armed services, the majority expect eventually to seek that degree. Oakland University hopes to offer a complete program leading to the Ph.D. in mathematics beginning within the next two years so that students entering in the fall of 1970 and subsequently could complete their Ph.D. in mathematics at Oakland. 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.

Teaching Assistantships

Teaching assistantships are available for most full-time gradu-

ate students. In 1969-70 each carried a stipend of \$2,500 for two semesters and a waiver, for non-residents, of out-of-state tuition. In 1970-71, the stipend is likely to be somewhat higher. Scholarship support in addition to the stipend is also available. The duties of an assistant ordinarily consist of six hours a week of recitation supervision in calculus and other elementary courses.

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 three department members. The committee is charged with passing on the acceptability of the student's program and with setting a comprehensive examination for him near the end of the program.

COURSE OFFERINGS

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

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 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 541-542 Applied Mathematics (4 credits each)

Vector spaces and vector fields; systems of ordinary differential equations;

qualitative theory of ordinary differential equations; partial differential equations of mathematical physics and of the life sciences; mathematical models in physical, life, and social sciences; scientific theories and 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)

Analytic functions, Cauchy's theorem, representation theorems, analytic continuation, Riemann surfaces, and 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 (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 jointly sponsored by the Department of Mathematics and the School of Education. The primary purpose of this program is to provide a Level IV preparation in mathematics as recommended by the Committee on the Undergraduate Program in Mathematics of the Mathematical Association of America. Students in the program have the opportunity to increase significantly their knowledge of mathematics and its teaching, and graduates are qualified for teaching advanced placement courses in high school (calculus, linear algebra, probability etc.) or for teaching at the freshman or sophomore levels in college.

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 take a single course which meets in the late afternoon to afford minimum disruption to the schedules of those engaged in high school teaching. Participation in the eight-week Summer Session, on the other hand, is usually full time. On this basis the degree requirements can be satisfied in a little less than two and one-half years.

Admission to Course

A background of at least 30 credits in undergraduate mathematics is required of applicants.

Requirements for the Degree

The requirements for the degree of Master of Arts in Teaching are 36 credits of graduate work. Normally a candidate will complete seven 4-credit courses in mathematics, one 4-credit course chosen from ED 601, ED 602, ED 603, or ED 604, and one 4-credit course chosen from PSY 510 or PSY 520. Among the mathematics credits must be included at least 4 credits in independent reading, and the candidate must present to the Department of Mathematics a critical essay based on his reading. A committee of three faculty members is charged with passing on the acceptability of the student's program and with setting a comprehensive examination for him near the end of the program. Schedules for degree work will vary considerably, but the following program is typical for a part-time student who is not seeking teaching certification.

SAMPLE PROGRAM

First Year

Fall Semester: MTH 514 Concepts in Abstract Algebra
Winter Semester: MTH 515 Concepts in Abstract Algebra
Summer Session: MTH 425 Probability
ED 602 Philosophy of Education

Second Year

Fall Semester: MTH 517 Concepts in Analysis
Winter Semester: MTH 518 Concepts in Analysis
Summer Session: MTH 416 Concepts of Geometry
PSY 520 Tests and Measurements

Third Year

Fall Semester: MTH 590 Directed Reading and Research

COURSE OFFERINGS

Mathematics courses offered for the program include the following sequences in algebra and analysis, which provide the core of most students' degree work. (One credit hour is equal to one semester hour.)

MTH 514-515 Concepts in Abstract Algebra (4 credits each)

Includes topics from groups, rings, fields, matrices, linear transformations, and vector spaces.

MTH 517-518 Concepts in Analysis (4 credits each)

Includes study of real and complex numbers, functions, limits, differentiation, integration, and infinite series, with emphasis on careful proofs of theorems.

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

Other Courses

Other mathematics courses can be taken from departmental offerings at the senior and graduate levels. When such courses are given during the Summer Session, they are likely to be modified to meet special interests of candidates for the degree of Master of Arts in Teaching.

DEPARTMENT OF PHYSICS

Professors: Ralph C. Mobley, Chairman
Robert M. Williamson

Associate Professors: John M. McKinley
Norman Tepley
Paul A. Tipler

Assistant Professors: Granvil C. Kyker, Jr.
Marshall J. Sheinblatt

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 seminar are the only fixed course requirements.

Teaching Assistantships

Teaching assistantships are available at the discretion of the Department. In 1969-70 an assistantship requiring twelve hours of work a week for two semesters paid a stipend of \$2,500 and carried in addition a waiver of out-of-state tuition for non-residents. In 1970-71 the stipend is likely to be somewhat higher.

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 candidate to demonstrate that the work done is relevant and com-

plementary to his Oakland program. Such a petition should be made as early as possible in the student's program and must be made before he has completed 12 credit hours at Oakland University.

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 II; 22 credits of 400-, 500-, or 600-level courses approved by the Department; 8 credits of research, including a final written report or critical essay; 2 credits of seminar.

RESEARCH FIELDS AND FACILITIES

The faculty of the Department of Physics now consists of two theoretical nuclear physicists, six low-energy experimental nuclear physicists, and one solid-state physicist. Research facilities include a 450 kv. Cockroft-Walton nuclear particle accelerator, two multichannel analyzers, a time-of-flight analyzer, and associated fast-pulse electronics for work in elastic and inelastic fast-neutron scattering and gamma-ray spectroscopy. An electrostatic ion buncher for d.c. nuclear accelerators, originated at Oakland, is under development. When combined with present equipment, the buncher is expected to provide a unique facility for low-energy nuclear research.

The Kettering Magnetics Laboratory, operated by the Physics Department and located on campus in a special non-magnetic building, also offers an unusual opportunity for studies in a near-zero magnetic field environment. Research in the gyromagnetic properties of solids and gases is currently being undertaken in the laboratory. For a description of this facility, see p. 12.

In addition, a solid-state program utilizing a high-field 9-inch Varian electromagnet and involving the magnetoacoustic properties of metals at microwave frequencies is now being initiated.

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, 361, and 371, or equivalent.

PHY 421 Thermodynamics (4 credits)
The zeroth, first and second laws of thermodynamics with applications to pure substances. Introduction to the kinetic theory of gases and to statistical mechanics.

Prerequisites: PHY 151 and MTH 254, or equivalent.

PHY 472 Quantum Mechanics I (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.
Prerequisite: PHY 341 or equivalent.

PHY 548 Advanced Electronics Laboratory (2 credits)
Prerequisite: PHY 348 or equivalent.

PHY 562 Mechanics II (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, with emphasis on current experimental techniques.
Prerequisites: PHY 472 and 562, or equivalent.

PHY 600 Seminar (1 credit)

PHY 673 Quantum Mechanics II (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 Quantum Mechanics III (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)

DEPARTMENT OF PSYCHOLOGY

Professors: Donald C. Hildum, Acting Chairman
Edward A. Bantel
David C. Beardslee
Harvey Burdick
Donald D. O'Dowd

Associate Professors: Jean S. Braun
Kenneth H. Coffman
David G. Lowy
Irving Torgoff

Assistant Professors: Robert N. Blockovich
Max Brill
Joseph S. Dumas
Evelyn W. Katz
L. Crocker Peoples
Ralph J. Schillace
David W. Shantz

Instructor: Lorna Middendorf

THE MASTER OF ARTS IN PSYCHOLOGY

The primary purposes of the program 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, developmental psychology, and general psychology.

Teaching and Research Assistantships

Teaching and research assistantships are available in varying amounts. The awarding of assistantships is at the discretion of the Department. An assistantship requiring twenty hours of work a week for two semesters paid \$2,500 in 1969-70 but is expected to be somewhat higher in 1970-71. A graduate student appointed assistant may register for 8 credits (two courses) per semester. Only students who can give full time to the combination of assisting and course work are eligible to apply. Some tuition scholarships are also available to graduate students; they are awarded on a competitive basis.

Admission to Course

An applicant for admission to the program leading to the degree of Master of Arts in psychology 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. Those who are not may be asked to take a core undergraduate curriculum as a prerequisite for admission to the program.

Readmission

A graduate student in psychology whose registration is interrupted for one or more semesters (excluding the Spring or Summer Session) may be readmitted only with the permission of the Department of Psychology. Such readmission must be processed through the Office of Graduate Study at least three months prior to the date of re-entry.

Requirements for the Degree

Nine courses (36 credits) are required, including satisfactory completion of a research project. All students, regardless of program, must take PSY 610 and 611.

TYPICAL PROGRAMS

Developmental Psychology

- Semester 1: PSY 515 Theories of Development
PSY 610 Pro-Seminar
- Semester 2: PSY 571 Perceptual and Cognitive Development
PSY 611 Research Methods and Project
- Semester 3: PSY 570 Social and Personality Development
PSY 572 Psychology of Adolescence and Aging
- Semester 4: PSY 670 Applied Developmental Psychology
Elective—to be chosen in consultation
with student's adviser
PSY 690 Research Project

Clinical Psychology

- Semester 1: PSY 530 Advanced Abnormal
PSY 610 Pro-Seminar
- Semester 2: PSY 611 Research Methods and Project
PSY 620 Individual Testing
- Summer: PSY 690 Research Project
- Semester 3: PSY 621 Projective Tests
Elective—to be chosen in consultation
with student's adviser
- Semester 4: PSY 630 Clinical Psychology
PSY 680 Practicum I or PSY 681 Practicum II

COURSE OFFERINGS

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

PSY 510 Developmental Psychology (4 credits)
Description and evaluation of the principles and theories of development from

birth to maturity. Maturation processes, learning, and emotional disturbances will be some of the issues considered.

Prerequisite: Permission of the instructor or acceptance into the Master of Arts in Teaching program.

PSY 515 Theories of Development (4 credits)

A review and critical analysis of major issues and theories concerning the developmental process from birth to old age. The approaches of such theorists as Lewin, Freud, Piaget, Erikson, and leading exponents of social-learning theory will be examined.

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

PSY 520 Tests and Measurements (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 525 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 520, or acceptance into the Master of Arts in Teaching program in special education, or undergraduate major in psychology, or permission of the instructor.

PSY 530 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.

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: Acceptance into the graduate program.

PSY 561 Advanced Statistics (4 credits)

Following a review of descriptive and simple inferential statistics, major emphasis will be given to analysis of variance procedures and non-parametric statistics. An introduction to functions and procedures of factor analysis will also be presented.

Prerequisite: An undergraduate course in statistics.

PSY 570 Social and Personality Development (4 credits)

A review and critical examination of major contemporary theoretical, research, and applied activity focusing on familial and extra-familial socialization, parent-child relations, peer influences, and the impact of social change on personality development. This material will be integrated with field experiences in relevant settings.

Prerequisite: Acceptance into the graduate program.

PSY 571 Perceptual and Cognitive Development (4 credits)

A review and critical examination of major contemporary theoretical, research, and applied activity in the developmental nature of perception, learning, reasoning, concept formation, cognitive style, problem-solving behavior, and

language. This material will be integrated with field experiences in relevant settings.

Prerequisite: Acceptance into the graduate program.

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.

PSY 595 Special Topics (4 credits)

Exploration of current findings and theory in an area of special interest.

Prerequisites: Four courses in psychology and permission of the instructor.

PSY 610 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.

PSY 611 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 collection, and data quantification methods. Attention will be given to problems of applied research and utilization of basic research in applied settings. Each student will be required to examine methodological issues and techniques of particular relevance to his area of specialization. Each student will be required to design an individual research project.

Prerequisite: Acceptance into the graduate program.

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

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.

PSY 630 Clinical Psychology (4 credits)

The nature and scope of clinical psychology and the role of the clinician. Assessment and behavior modification will be emphasized.

Prerequisite: Acceptance into the graduate program.

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.

PSY 680 Practicum I (4 credits)

Practical experience in the student's area of specialized technical training. May be in one of the following settings: schools, state hospitals, courts, psychological service centers, social work agencies, etc. Approximately 200 hours.

Prerequisites: Admission to degree candidacy in the graduate program and permission of the instructor.

PSY 681 Practicum II (4 credits)

Continuation of Practicum I at a more advanced level. Approximately 200 hours.

Prerequisites: Admission to degree candidacy in the graduate program and permission of the instructor.

PSY 690 Research Project (4 credits)

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

Prerequisite: Admission to degree candidacy in the graduate program.

SCHOOL OF EDUCATION

Laszlo J. Hetenyi, Dean

Roderic E. Righter, Associate Dean

TEACHING FACULTY

DEPARTMENT OF TEACHER EDUCATION

Professors: Edward A. Bantel
George E. Coon
Harry T. Hahn
Laszlo J. Hetenyi
Virginia B. Morrison

Associate Professors: Harold C. Cafone
William F. Moorhouse
Roderic E. Righter

Assistant Professors: David C. Bricker
Marc E. Briod
Kenneth R. Conklin
Ronald L. Cramer
Sidney W. Graber
James W. Hughes
Patrick J. Johnson
Jacqueline I. Loughheed

Instructor: F. James Clatworthy

COLLEGE OF ARTS AND SCIENCES

Professors: David C. Beardslee
Melvin Chernio
George F. Feeman
William C. Forbes
Edward J. Heubel
Donald C. Hildum
G. Philip Johnson
Carmine Rocco Linsalata
Jack R. Moeller
Donald D. O'Dowd
William Schwab

Associate Professors: Peter G. Evarts
Harold Gorvine
Don R. Iodice
David G. Lowy

W. Patrick Strauss
S. Bernard Thomas
Irving Torgoff

Assistant Professors: Henry J. Kennedy
Ralph J. Schillace

The School of Education is a genuinely interdisciplinary body. As the roster of the teaching faculty indicates, scholars from many departments contribute their talents to the education of teachers.

THE MASTER OF ARTS IN TEACHING

The College of Arts and Sciences and the School of Education jointly sponsor candidates for the degree of Master of Arts in Teaching in a variety of disciplines for secondary teachers. Programs are available now in English and mathematics; additional programs (social science, French, history) are projected for the future. For the degree requirements and typical programs for these degrees see below and see pp. 33-34 and pp. 39-40 of this bulletin.

The School of Education sponsors candidates for the degree of Master of Arts in Teaching in elementary education and in reading instruction. In the near future the School hopes to offer a program leading to the degree of Master of Arts in Teaching in special education (for emotionally disturbed children) and at a later date expects to offer work in counseling and guidance, in administration, and in the preparation of school diagnosticians.

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. (See p.69.) 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 the student has completed 12 credits (normally three courses), the committee will evaluate the student's progress and plan the remainder of his program. 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 his 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 special 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 in Mathematics

In general, most of the student's work will be in the discipline area of his major, with such cognates as his major department prescribes (see pp. 33-35 and pp. 39-40 of this bulletin), 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 Measurements (PSY 520); 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

Although each student's program will be developed by his guidance committee, the pattern below is a typical example. In planning the course of study, the guidance committee will not only take into account the student's current needs and interests, but will attempt to strengthen or supplement those areas of preparation in which the student may be deficient or in which new data have made further work desirable.

TYPICAL PROGRAM FOR THE MASTER OF ARTS IN TEACHING IN ELEMENTARY EDUCATION

I.	ED 601	History of Education	(4 credits)
	or		
	ED 602	Philosophy of Education	(4 credits)
	or		
	ED 603	Comparative Education	(4 credits)
	or		
	ED 604	Sociology of Education	(4 credits)
II.	PSY 510	Developmental Psychology	(4 credits)
	PSY 520	Tests and Measurements	(4 credits)
	ED 612	Curriculum Studies	(4 credits)
	ED 699	Terminal Project	(4 credits)

- III. Courses selected by the candidate and the guidance committee to produce a well-rounded program (16 credits)

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

The degree program in reading instruction includes a group of courses required for most students and an area of flexibility designed to adjust requirements to the needs and previous preparation of each student.

TYPICAL PROGRAM FOR THE MASTER OF ARTS IN TEACHING IN READING INSTRUCTION

- | | | | |
|------|--|------------------------------------|--------------|
| I. | ED 601 | History of Education | (4 credits) |
| | or | | |
| | ED 602 | Philosophy of Education | (4 credits) |
| | or | | |
| | ED 603 | Comparative Education | (4 credits) |
| | or | | |
| | ED 604 | Sociology of Education | (4 credits) |
| II. | PSY 510 | Developmental Psychology | (4 credits) |
| | PSY 520 | Tests and Measurements | (4 credits) |
| | ED 699 | Terminal Project | (4 credits) |
| III. | ED 632 | Diagnosis of Reading Disabilities | (4 credits) |
| | ED 633 | Correction of Reading Disabilities | (4 credits) |
| IV. | Courses selected by the candidate and the guidance committee to produce a well-rounded program | | (12 credits) |

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.

COURSE OFFERINGS

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

ED 509 The School and the Disadvantaged Child (2 or 4 credits)

A study of the difficulties and opportunities arising in the schooling of children from disadvantaged home environments. The course will concern itself with

such topics as: clashes between values in school and home environments, communication across subcultural barriers, problems of motivation, etc.
Prerequisite: Permission of the instructor.

ED 511 Interaction Analysis (4 credits)

The course seeks to improve effectiveness of instruction through a study of pupil-teacher interaction. Techniques of observation, methods of gathering data and analyzing behavior in both the affective and the cognitive fields are emphasized. Techniques will include video tapings of teachers and pupils, projects including observational schedules, and preparation and analysis of specific teaching situations.

Prerequisite: Admission to course in a graduate program or permission of the instructor.

ED 521 Education of Exceptional Children (4 credits)

The course is devoted to the special provisions, remedial procedures, care, treatment, education, and rehabilitation of several types of exceptional children. These include emotionally disturbed, mentally retarded, gifted, blind, deaf, physically handicapped, and other health-impaired children. Site visits to clinical and hospital as well as educational settings are included.

Prerequisite: Admission to a graduate program, or one year's teaching experience, or permission of the instructor.

ED 530 Advanced Topics in Literature for Children (4 credits)

The course centers on the critical analysis of child literature published in recent years. When the works of major authors and illustrators are studied in depth, the literature for children will be considered as part of the literary mainstream, but the course will emphasize specific approaches developed to help children read, understand, and enjoy literature.

Prerequisite: Admission to course in a graduate program or permission of the instructor.

ED 531 Current Trends in the Teaching of Reading (4 credits)

An intensive examination of current instructional practices, problems, and research in the teaching of reading. Prevailing trends in reading instruction will be evaluated in the light of cumulative research findings concerning the development of reading skills.

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

ED 532 Teaching Reading in the Primary Grades (4 credits)

This course is designed to examine principles, practices, and research related to early reading instruction. It will include an analysis of the relationship of the various language arts to reading skills and will place emphasis upon the developmental skills of pupils, starting with kindergarten.

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

ED 533 Teaching Reading in the Upper Grades (4 credits)

This course is designed to examine principles, practices, and research related to teaching of reading in Grade Four and higher grades. Emphasis will be placed upon the developmental reading skills in a reading program adjusted to the individual needs of pupils. Particular emphasis will be placed upon reading in the content areas.

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

ED 534 Language Arts Instruction in the Elementary Schools (4 credits)

This course is designed to provide a scholarly examination of research findings, materials, and procedures for the development of spelling, composition, speaking, and listening skills in children. Discussions will center on those areas of the curriculum which directly influence language development. The course will demonstrate how the coordinated-language-arts approach and the use of literature appropriate to each age level can balance the growth of communication skills.

Prerequisite: ED 331 or ED 531 or equivalent preparation in reading instruction.

ED 535 The Perceptually Handicapped in Reading (4 credits)

A study of theories of perception and their impact on the reading process. Identification of reading difficulties and implementation of corrective measures in the classroom will receive special emphasis.

Prerequisite: Permission of the instructor.

ED 536 Teaching Reading to the Special Child (4 credits)

A general discussion of the reading process as it relates to slow learners, emotionally disturbed, handicapped, but also gifted children. A study of remedial instructional materials is included.

Prerequisite: ED 521 or permission of the instructor.

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

A course dealing with specialized problems in various phases of education. Depending on the clientele and staff needs, the specific topics may differ from term to term. The course may be taken more than once, but for no more than a total of 8 credits. May be elected for independent study.

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

ED 591 Ecology of the Classroom (4 credits)

The course deals with the ecological context for learning in classroom, school, and community. The primary task will be to describe, to analyze, and to make inferences about the structure of the ecological environment. These findings will then be related to pupil learning.

Prerequisite: Permission of the instructor or acceptance into any graduate program.

ED 592 Research Techniques in Education (4 credits)

A study of research techniques in the behavioral sciences and education, methods of gathering evidence, elementary statistical concepts in education, research design, etc. Students preparing to start their terminal project will find the course especially helpful.

Prerequisite: Acceptance to candidacy in a master's program in education or permission of the instructor.

ED 601 History of Education (4 credits)

A study of the cultural forces (primarily in the West) as they shaped, and were shaped by, the education of the young. Characteristic patterns of educational institutions, changing conceptions of curricula, dominant social and philosophic ideas concerning education, and significant contributions by individual educators represent some of the professional topics which are discussed in their historical settings.

Prerequisite: Admission to course in any graduate program.

ED 602 Philosophy of Education (4 credits)

A study of philosophical inquiry in relation to education. Philosophic analysis of educational problems, educational conclusions by systematic philosophers, logical relationships between various philosophical and educational positions are among the topics considered.

Prerequisite: Admission to course in any graduate program.

ED 603 Comparative Education (4 credits)

An analysis of education and its relationship to social and economic change in various cultures. Lectures, readings, and discussions will deal primarily with existing educational systems originating in Western culture, such as those of Great Britain, U.S.S.R., Sierra Leone, and Kenya, but will also include some study of selected utopian educational systems.

Prerequisite: Admission to course in any graduate program.

ED 604 Sociology of Education (4 credits)

A study of social and cultural forces and their impact on the organization and practices of schools. An investigation of social dynamics within the schools and the impact of schools on other institutions of society.

Prerequisite: Admission to course in any graduate program.

ED 611 Problems in Elementary Education (4 or 8 credits)

A study of issues in the organization, curriculum, administration, and methodology of elementary schools. Student needs and preparation determine the specific topics included in a given semester. Students may register for this course once or twice, up to a total of 8 credits.

Prerequisite: Admission to course in a graduate program in elementary education or in reading instruction.

ED 612 Curriculum Studies (4 credits)

A study of practices in and research on curriculum in modern elementary schools. The course will investigate the sum total of experiences provided for young people in school settings and will challenge established practices on the basis of recent curricular developments.

Prerequisite: Admission to course in a graduate program in elementary education or in reading instruction.

ED 621 Management and Curriculum for Emotionally Disturbed Children (4 credits)

A study of the diagnosis and treatment, curriculum development, methods and material, and classroom procedures in programs for emotionally disturbed children in educational and clinical settings. The use of video tapes, role play, demonstrations, as well as direct observation of emotionally disturbed children will be included.

Prerequisite: ED 521 and one graduate course in psychology.

ED 622 Practicum in the Education of the Emotionally Disturbed (6 credits)

This is a specialized laboratory experience, including educationally related work in an interdisciplinary treatment setting with emotionally disturbed children. Observation, tutoring, diagnostic and prescriptive teaching on a one-to-one basis and in group instruction are part of the course. ED 623 must be taken concurrently.

Prerequisites: Completion of all other requirements for the degree of Master

of Arts in Teaching in special education or permission of the instructor.

ED 623 Seminar in the Education of the Emotionally Disturbed (2 credits)

A study and interpretation of psychological information, development of understanding of psychiatric intervention, the use of case study, and educational relevancy of case materials in dealing with the emotionally disturbed. Must be taken simultaneously with ED 622.

ED 624 Directed Teaching in Special Education (6 credits)

This is a supervised full-time teaching experience in classrooms corresponding to the student's concentration in special education. Those qualifying for exemption from the supervised teaching requirement in the certification code may not take this course.

Prerequisites: Acceptance to degree candidacy in a master's program in special education and approval by the director of the special education program.

ED 631 Problems in Reading Instruction (4 or 8 credits)

A study of diagnostic, methodological, organizational, and administrative issues in reading programs. Student needs and preparation determine the specific topics included in a given semester. Students may register for this course once or twice up to a total of 8 credits.

Prerequisites: Admission to course in a Master of Arts in Teaching program and at least one previous course in reading instruction.

ED 632 Diagnosis of Reading Disabilities (4 credits)

A laboratory course concerned with the analysis and study of factors which contribute to or precipitate reading disabilities in elementary and/or secondary school pupils. The course includes selection and administration of both informal and standardized tests and also deals with the preparation and evaluation of case reports.

Prerequisites: Admission to course in a Master of Arts in Teaching program and at least one previous course in reading instruction.

ED 633 Correction of Reading Disabilities (4 credits)

A laboratory course designed to focus attention on methods, materials, and practices pertaining to the instruction of disabled readers. The course provides opportunities to plan, organize, and conduct remedial instruction for children under the supervision of the instructor.

Prerequisites: Admission to course in a Master of Arts in Teaching program and at least one previous course in reading instruction.

ED 699 Terminal Project (4 credits)

The planning and execution of a significant research or action project in accordance with the advice of the student's guidance committee.

Prerequisites: Admission to degree candidacy in a graduate program in elementary education or reading instruction and 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.

Related Courses

Certain courses offered by the Department of Psychology are of special interest to graduate students preparing for a Master of Arts in Teaching degree: PSY 510, PSY 520, PSY 525, PSY 620. For descriptions of these courses, see pp. 45-47.

Other related courses appropriate for the Master of Arts in Teaching program are:

MTH 511 Mathematics for the Elementary School Teacher I (4 credits)

Study of the structure of the real number system, elementary number theory, introduction to abstract mathematical structures.

This course may not be taken for graduate credit by anyone who has received credit for MTH 314, 315, or 316 or their equivalents except by permission of the Department.

MTH 512 Mathematics for the Elementary School Teacher II (4 credits)

Study of set theory, logic, probability theory, statistics, and topics in geometry.

This course may not be taken for graduate credit by anyone who has received credit for MTH 314, 315, or 316 or their equivalents except by permission of the Department.

MTH 513 Topics in Elementary School Mathematics (4 credits)

Topics in elementary mathematics selected in keeping with latest trends in elementary school curriculum reform. Methods of teaching these topics are studied simultaneously with the topics themselves for the purpose of creating appropriate curriculum and testing materials.

Prerequisite: MTH 314, 315, and 316 *or* MTH 511 and 512 *or* permission of the Department.

SCI 505 Basic Concepts and New Developments in Science (4 credits)

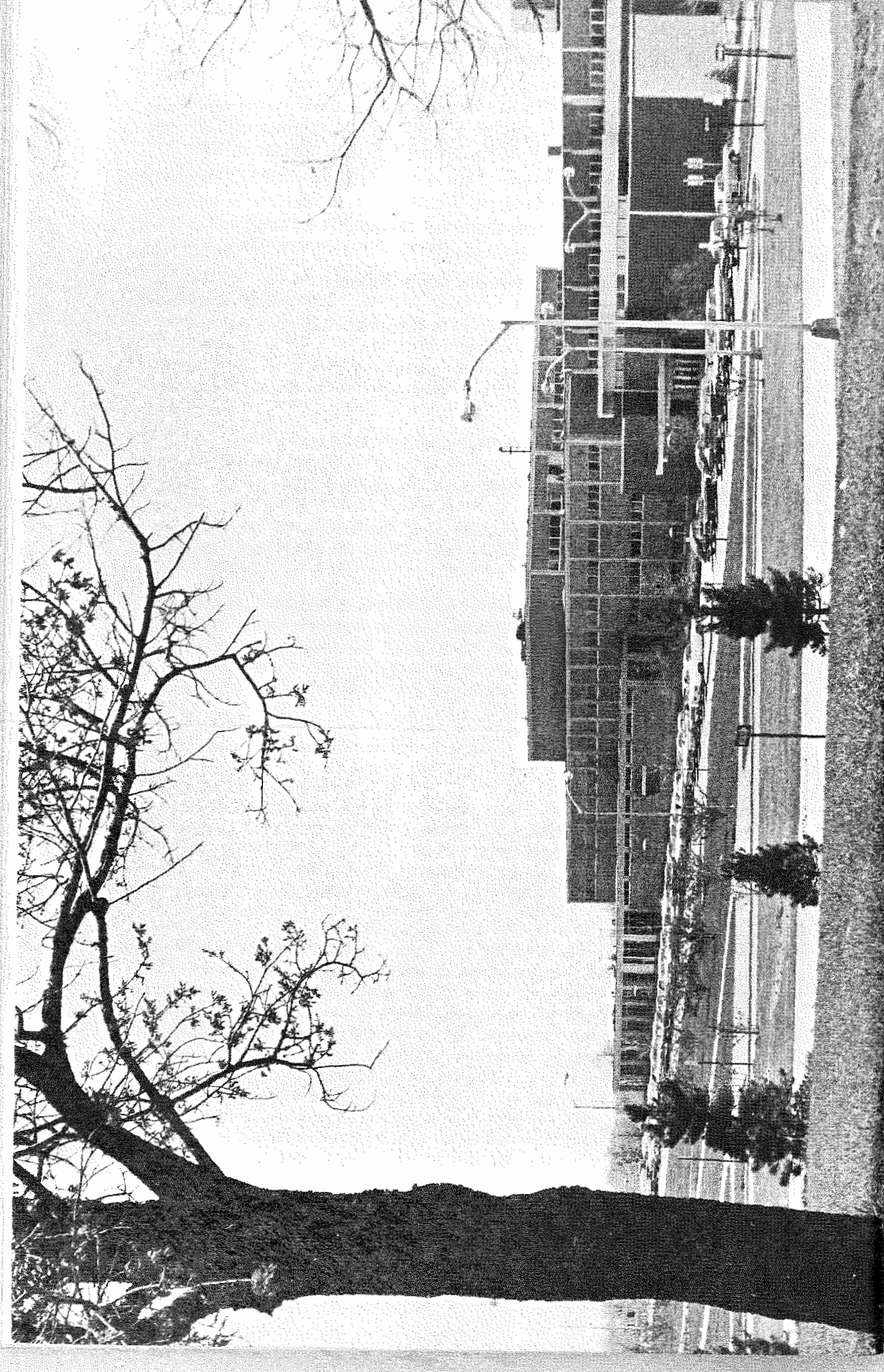
Basic concepts in science and science methodology. An intensive study of one science area (e.g., biology, chemistry, physics, etc.) and a study of the new curricula in science for the elementary school.

Prerequisite: Admission to course in a graduate program in elementary education or in reading instruction or permission of the instructor.

SS 570 Social Studies in the Elementary School (4 credits)

An intensive study of current trends, challenges, characteristics, and content of effective social studies programs, with emphasis on the relationships among discipline areas comprising the social studies. The course will stress application of these studies in urban-area elementary schools.

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



SCHOOL OF ENGINEERING

John E. Gibson, Dean
Keith R. Kleckner, Assistant Dean
Howard R. Witt, Assistant Dean

Professors: Peter C. Bertelson (Visiting)
Benjamin F. Cheydleur
David H. Evans (Visiting)
John E. Gibson
William G. Hammerle
J. Carroll Hill
Keeve M. Siegel (Visiting)

Associate Professors: Robert H. Edgerton
Richard E. Haskell
Keith R. Kleckner
Gilbert L. Wedekind
Howard R. Witt

Assistant Professors: David E. Boddy
Robert G. Heeren
Glenn A. Jackson
Tung H. Weng

Instructors: Albert F. Houchens
Anthony G. Vasek

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. Minor concentrations in related fields of physics and mathematics are also available. 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. Highly specialized and narrowly defined research is perhaps more appropriately delayed for doctoral thesis preparation.

Some courses are arranged in the late afternoon and early morning 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.

Teaching and Research Assistantships

Graduate teaching assistantships and research assistantships are available on a competitive basis. In 1969-70 the stipend for two semesters was \$2,500, and it is expected to be somewhat higher in 1970-71. The holder may register for as many as 9 credits. Outstanding assistantship holders are recommended by the School of Engineering for tuition and fee scholarships, which are awarded on a University-wide competitive basis. Out-of-state tuition is waived for non-resident holders of assistantships. Summer research assistantships are also available to students who demonstrate superior academic performance. Renewal of the assistantship is contingent on satisfactory progress toward the degree.

A student proceeding on a full-time basis (three 4-credit courses per 15-week semester) can often complete the course requirements for the master's degree in one calendar year.

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. Each entrant consults individually with the faculty to plan a program of courses which best suits his background and interests.

Admission to graduate 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

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 36 credits of graduate courses in engineering and related areas of the sciences and mathematics, the whole to form an integrated program of study proposed by the student and approved by his program adviser.

Students are encouraged to arrange a program which best suits their special interests, subject only to the following general requirements.

(1) Each candidate for the degree of Master of Science shall be re-

quired 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 a 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 36 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, 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. Stu-

dents 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.

TYPICAL PROGRAMS

Systems Engineering

Semester 1:	EGR 500 Graduate Seminar	(1 credit)
	EGR 520 Analysis and Synthesis of Linear Control Systems	(4 credits)
	EGR 530 Introduction to Random Signals and Systems	(4 credits)
	MTH 531 Mathematical Methods in Engineering I	(4 credits)
Semester 2:	EGR 500 Graduate Seminar	(1 credit)
	EGR 509 Engineering Design Project	(2 credits)
	EGR 521 Modern Topics in Control Engineering	(4 credits)
	MTH 532 Mathematical Methods in Engineering II	(4 credits)
Semester 3:	EGR 509 Engineering Design Project	(4 credits)
	EGR 535 Large Scale Systems Engineering or physics elective	(4 credits)

Energy Engineering

Semester 1:	EGR 500 Graduate Seminar	(1 credit)
	EGR 510 Engineering Fields	(4 credits)
	EGR 551 Convective Transport Phenomena	(4 credits)
	MTH 531 Mathematical Methods in Engineering I	(4 credits)
Semester 2:	EGR 500 Graduate Seminar	(1 credit)
	EGR 509 Engineering Design Project	(2 credits)
	EGR 535 Large Scale Systems	(4 credits)
	EGR 552 Thermal Transport Phenomena	(4 credits)
Semester 3:	EGR 509 Engineering Design Project	(4 credits)
	EGR 555 Energy and Information Systems Engineering, mathematics, or physics elective	(4 credits)

Electromagnetic and Optical Engineering

Semester 1:	EGR 500 Graduate Seminar	(1 credit)
	EGR 510 Engineering Fields	(4 credits)
	EGR 530 Introduction to Random Signals and Systems	(4 credits)
	MTH 531 Mathematical Methods in Engineering I	(4 credits)
Semester 2:	EGR 500 Graduate Seminar	(1 credit)
	EGR 509 Engineering Design Project	(2 credits)
	EGR 540 Electromagnetic Signals and Waves	(4 credits)
	MTH 532 Mathematical Methods in Engineering II	(4 credits)
Semester 3:	EGR 509 Engineering Design Project	(4 credits)
	EGR 550 Coherent Optics Engineering or physics elective	(4 credits)

RESEARCH FACILITIES

The School of Engineering is located in the new Dodge Hall of Engineering. With 135,000 square feet of space and many well-equipped laboratories, Dodge Hall gives the School one of the fine facilities in the nation for engineering education. In addition to all the usual teaching and research laboratories a number of special facilities are worth noting. Communication ducts make it possible to wire experiments directly to the Computing and Data Processing Center for real-time data reduction. A recent development grant to the School from the National Science Foundation has permitted the installation of a complete hybrid computer facility which is designed to patch a large digital computer facility into an analog facility and to laboratory experiments. A special rooftop communication laboratory with sliding walls gives access to a one-mile free-space carry for propagation tests. Special explosion-proof test cells and control room are available for high-energy transformation tests of all sorts. Through cooperation with the Department of Biological Sciences, bioengineering finds itself in an enviable position for laboratory work. Dark rooms, machine shops, electronic shops, technicians, etc., are available to support the extensive research programs of the School.

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. Topics will vary from semester to semester, with emphasis on current research interests of the School. May be taken more than once.		

EGR 505 Special Topics in Engineering (4 credits)

Discussion of areas of current research interest. Topics vary from semester to semester. May be taken more than once. Recent topics have included mechanics, operations research, and hybrid computation.

EGR 509 Engineering Design Project (2 to 12 credits)

A project requiring independent design effort by the student. The student should develop theoretical studies first and subsequently design the appropriate hardware. Laboratory and computer studies will be included. Emphasis is placed on completing the project properly within time limits and on preparation of the final report.

EGR 510 Engineering Fields (4 credits)

A unified approach to engineering field theory: scalar, vector, and tensor fields; differential equations of elasticity; fluid dynamics and electrodynamics; potential theory; static and time-varying fields.

EGR 520 Analysis and Synthesis of Linear Control Systems (4 credits)

Analysis and synthesis of linear dynamical systems in both time and frequency domains. State-variable representations, frequency response and transform analysis, system stability, multi-input and multi-output systems, performance indices. Analog and digital simulation techniques are used extensively.

EGR 521 Modern Topics in Control Engineering (4 credits)

Time-domain analysis of control systems; Lagrange's equations; phase-plane analysis; stability; optimal control.

EGR 530 Introduction to Random Signals and Systems (4 credits)

An introduction to the analysis and design of control and communication systems which process random signals. Probability and the description of random signals; correlation functions; power spectra; filtering; and an introduction to detection theory.

EGR 535 Large Scale Systems (4 credits)

System management, PERT, CPM, operations research, simulation, man-machine interface problems, game theory, queuing theory, traffic control. Each term a specific system study will be conducted in an area such as a life support system for a moon colony, saline water conversion, or a specific mass transportation method. Major emphasis is placed on preparation of the project report.

EGR 540 Electromagnetic Signals and Waves (4 credits)

Reflection and refractions of electromagnetic waves; guided waves; anisotropic media; radiation and diffraction theory; partial coherence.
Prerequisite: EGR 510.

EGR 550 Coherent Optics (4 credits)

Current developments in the field of coherent optics; theory and application of laser sources; recent advances in holography; use of coherent optics in data processing and communication systems; laboratory work and demonstrations are included.

Prerequisites: EGR 510 and EGR 530.

EGR 551 Convective Transport Phenomena (4 credits)

The development of the fundamental equations expressing conservation of mass, momentum, and charge. Consideration of ideal and viscous fluids with mass transfer. Approximation techniques for solution of the conservation equations. Emphasis will be on convective transfer of momentum, mass, and charge. Introduction to turbulent transport processes.

EGR 552 Thermal Transport Phenomena (4 credits)

Development of the fundamental continuum equation expressing the principle of the conservation of energy. Radiation heat transfer; conduction heat transfer; extended surfaces; multidimensional conduction problems and one-dimensional unsteady conduction problems. Convective heat transfer; thermal boundary layer theory; forced and natural convection; and two-phase flow phenomena.

EGR 555 Energy and Information Systems (4 credits)

Energy and entropy considerations of conservative and non-conservative systems. Study of the information and energy transfer in transducers and sensors. Modeling of system components governed by thermodynamic processes. Availability analysis of energy conversion and transformation systems. Introduction to irreversible thermodynamics.

EGR 580 Digital Computer Methods in Engineering (4 credits)

The application of digital computer numerical methods to engineering problems. Classical methods for solving general algebraic equations, polynomial factoring, Runge-Kutta and predictor-corrector methods for solutions of ordinary differential equations, and matrix computer methods. Also included are various contemporary methods such as Laplace transform inversion, Latin Squares techniques, partial differential equations, and the Fast Fourier Transform. Emphasis is placed on student development of general purpose subroutines for use in engineering applications.

Prerequisite: Permission of the instructor.

EGR 581 Hybrid Computation and Simulation (4 credits)

An introduction to the application of hybrid and iterative analog computing techniques to large-scale engineering problems. Sampling, split simulation, nonlinear function generation, time-delay generation, parameter optimization, partial differential equations, and error analysis of hybrid computing systems.
Prerequisite: Permission of the instructor.

EGR 585 Switching Theory (4 credits)

Boolean algebraic symbolization for nets of binary switched circuits such as counters, timers, and coders for typical computer subsystems. Constructive computation of nonredundant expansions by formal matrix methods are considered and translated into laboratory devices with building block computer elements for computation and on-line data reduction. Introduction to sequential switching decomposition for control and programming of systems.
Prerequisite: Permission of the instructor.

Related Courses

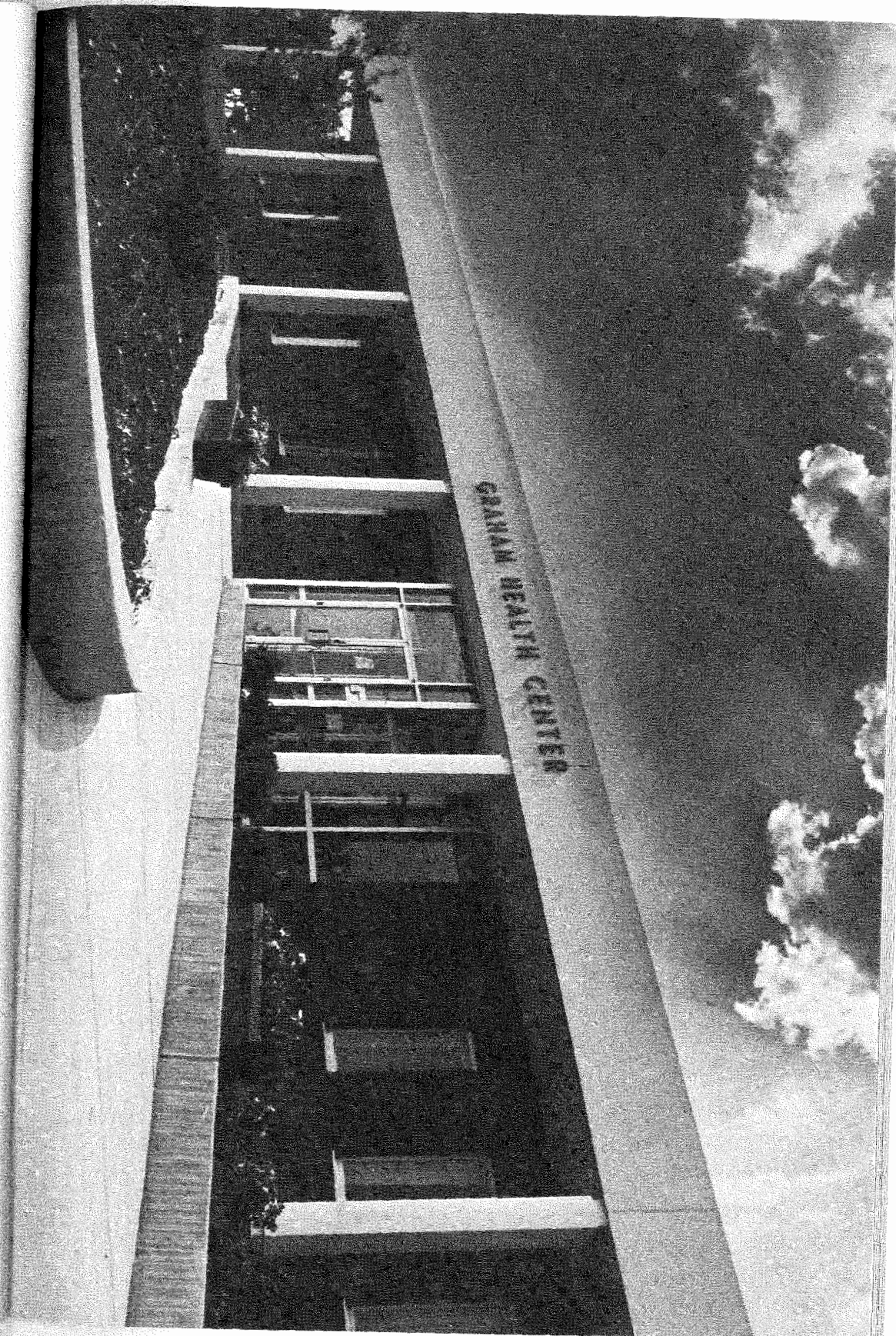
MTH 531 Mathematical Methods in Engineering I (4 credits)

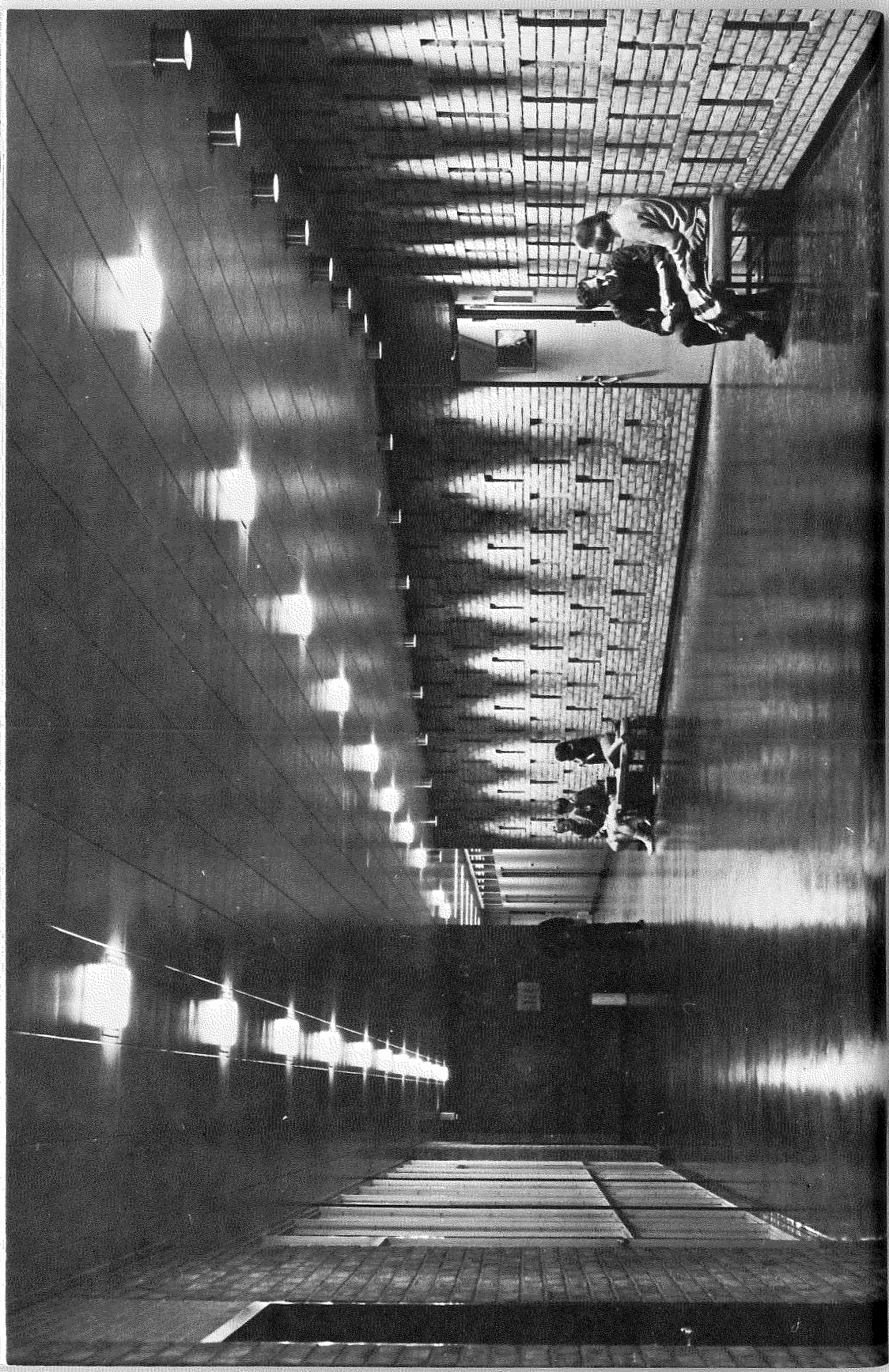
Vector spaces and matrices, eigenvalue problems, applications to systems of differential equations, numerical methods in linear algebra, Infinite series,

Taylor's series, power series methods in differential equations.
Prerequisite: Graduate standing.

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.
Prerequisite: MTH 531.





ADMISSION, DEGREE CANDIDACY, 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. Usually the degree must have been conferred within the past ten years; occasionally applicants with degrees awarded more than ten years ago may be admitted.

APPLICATION FOR ADMISSION BY FOREIGN STUDENTS

A foreign student should write to the Office of Graduate Study, 364 Dodge Hall, Oakland University, Rochester, Michigan 48063, at least six months prior to the date he hopes to enter the University. He will be sent instructions and application forms which he should complete and return at once. Assuming the application is approved, he will receive a certificate of permission to enter the University. Foreign students are normally required to submit scores from the Graduate Record Examination Aptitude Test prior to admission. One or more Advanced Tests of the Graduate Record Examination may be required at the discretion of the department or school to which the student is applying. Also required are scores from the Test of English as a Foreign Language or a comparable examination.

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

Application for admission to course must be accompanied by an official record of work done at undergraduate and graduate institutions.

Admission to course neither implies nor precludes admission to degree candidacy.

Upon completion of three graduate courses (12 credits), the student must apply to his sponsoring department or school for admis-

sion to degree candidacy. Normally, a maximum load is 12 credits per semester.

DEGREE CANDIDACY

A student must apply for admission to degree candidacy upon completion of 12 credits at Oakland University unless he is registered under Special Graduate Status. Application forms are available in the department or school in which the student is enrolled.

When the student applies for degree candidacy the sponsoring department or school will:

- (1) accept him as a degree candidate, or
- (2) permit him to continue on a non-matriculated basis, or
- (3) recommend that he withdraw from the University.

The recommendation of the department or school will be regarded as final unless the student wishes to make special petition to the Graduate Council.

TRANSFER OF CREDIT

A graduate student wishing to transfer credit from other colleges or universities must have such credit approved by his academic adviser. The credit to be transferred will be included on the Application for Admission to Degree Candidacy. A maximum of 12 semester hours or 16 quarter hours will be accepted toward a graduate degree, assuming the credit is approved by the academic adviser and the Dean of Graduate Study. Conversely, 24 semester hours constitute the normal minimum residence requirement. One semester hour equals one credit. 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 a student who wishes to take graduate courses but not to work toward a degree. An applicant wishing to strengthen his background in a particular field, to gain credits required for permanent teacher certification, to strengthen his background prior to admission to a graduate degree program, or to work toward provisional 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 later if it is appropriate to the degree objective. However, admission under Special Graduate Status in no way implies admission to a degree program. A Special Graduate Status student who wishes to apply for admission to course or degree candidacy must file a request for change of status with the Office of Graduate Study. Approval of this request is the

option of the academic department or school.

Although admission under Special Graduate Status may be granted prior to the receipt of transcripts and letters of recommendation, an official transcript verifying receipt of a baccalaureate or its equivalent from an accredited undergraduate institution must be on file before the end of the student's first semester on campus or re-enrollment will not be allowed.

Students attending under Special Graduate Status are normally limited to a maximum of 12 credits of graduate work at Oakland University.

TEACHER CERTIFICATION

A student who has his baccalaureate and wishes to work toward provisional teacher certification should apply as a Special Graduate Status student "for certification only." The application must be filed, and official transcripts from each undergraduate or graduate college or university attended must be submitted. Assuming admission is granted, the student will be referred to an appropriate faculty member who will assist the student in developing a certification program.

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. Students admitted under Special Graduate Status are encouraged to contact the Office of Graduate Study if advice regarding course selection is required.

WITHDRAWAL

A graduate student withdrawing from the University must do so through the Office of Graduate Study. For University policy on the refund of tuition and fees to students who withdraw voluntarily, see p. 78 of this bulletin. Grades are determined according to the effective date of withdrawal. All students who withdraw must obtain the permission of the Office of Graduate Study to re-enroll.

When a student has so recorded official voluntary withdrawal from the University, his grades will be determined as follows:

- (a) Before the end of the first two weeks of classes, no grades will be recorded.
- (b) From the third week through the ninth, a grade of "N" will be given.
- (c) After the ninth week, a grade of "N" or 0.0 will be assigned by the instructor in consultation with the Office of Graduate Study.

READMISSION

A graduate student whose registration is interrupted for one or more semesters (excluding the Spring or Summer Session) is encouraged to notify the Office of Graduate Study prior to the date of re-entry.

Special readmission policies pertaining to psychology and English majors are outlined on pp. 31 and 45.

PHYSICAL EXAMINATION

All graduate assistants and those graduate students who plan to take more than 8 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.

GRADES AND GRADE POINT SYSTEM

Oakland University uses a numerical grading system in which the scale of grades rises by tenths from 0.0 to 4.3. The grade numbers 0.1, 0.2, 0.3 and 0.4 are not used. No credit for a final grade below 2.0 may be applied toward a master's degree. That is to say, only grades from 2.0 to 4.3 are in the range necessary for credit toward a degree. However, 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.

ACADEMIC RECORD

A report of the student's grades in each course is sent to the student at the end of each semester. A permanent record of all the student's courses, credits, and grades earned is kept at the Office of the Registrar. Copies of the permanent record are available to the student upon request and payment of a small service charge.

QUALITY OF GRADUATE WORK

The quantitative grade requirements given above for graduate work at Oakland University must be considered to be minimum standards only. More is expected of every graduate student than merely to meet

these minimums and to compile a required number of credits. Prescribed courses should be regarded by the graduate student as introductions to subject areas in which he seeks to develop scholarly competence. As a graduate student he undertakes to work beyond requirement on his own initiative, to apply and interpret what he has learned, to derive from study orderly habits of critical and analytical thinking, to arrive at independent conclusions based on his own research, and to conceive of each degree earned primarily as certification of his readiness to proceed to new levels of scholarly attainment.

MASTER'S THESIS: BINDING, FORMAT, AND STYLE

Some departments and schools of the University require a master's thesis; some others accept, but do not require, a master's thesis. After the thesis has been approved by the Thesis Committee, the candidate will arrange with the Office of Graduate Study for the permanent deposit of two bound copies of his thesis in the University Library. One copy will be placed in the University Archives and the other in the circulating thesis collection. Costs of binding will be paid by the degree candidate to the Office of Graduate Study. Binding must conform to specifications established by the Library.

Paper used for deposit copies must be of good quality, of a weight not less than 16-pound rag bond, 8½x11 inches in size. The left margin must not be less than 1½ inches and the top, right, and bottom margins not less than 1 inch. The thesis must be typewritten, in either pica or elite type. Typing must be double spaced, except for footnotes and extended quotations, which should be single spaced. Clean copy is essential.

Bibliographical style must be consistent. The following style manuals are recommended:

Modern Language Association of America. *The MLA Style Sheet*.

Compiled by William Riley Parker. Rev. ed. New York, 1967.

Seeber, Edward D. *A Style Manual for Students*. Bloomington, 1964.

Turabian, Kate L. *A Manual for Writers of Term Papers, Theses, and Dissertations*. 3rd. ed. revised. Chicago, 1967.

University of Chicago Press. *A Manual of Style*. 12th ed. revised. Chicago, 1969.

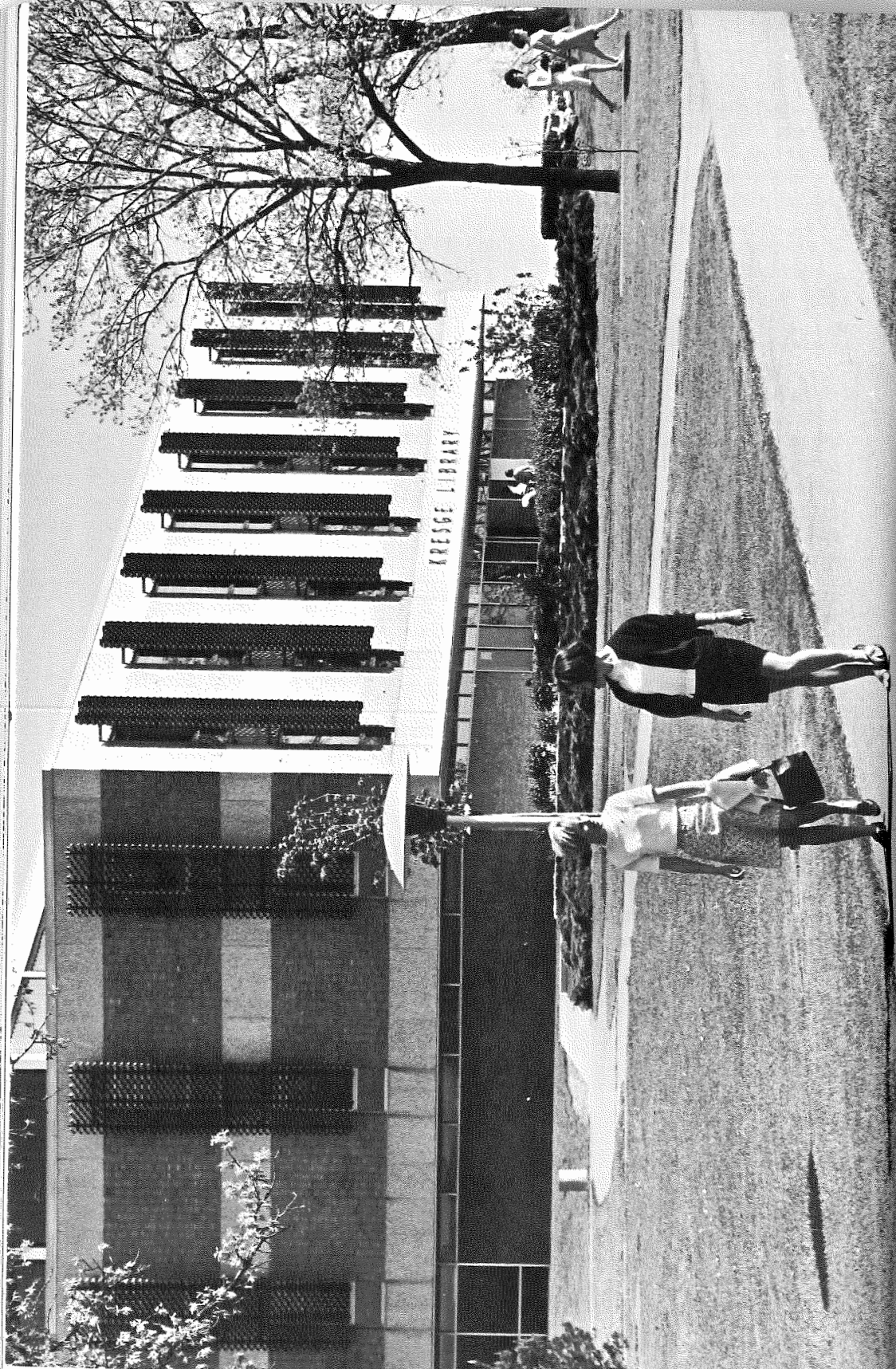
FINANCIAL AID

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 in the amount of tuition and fees are awarded on a University-wide competitive basis to students nominated by the various academic departments and schools. Inquiries concerning all other kinds of financial aid should be directed to the Financial Aid Office as early as possible before registration. Aid is offered in the form of National Defense Education Act Loans and employment under the College Work Study Program to graduate students who can demonstrate need. The Office of Graduate Study counsels graduate students on making application for a range of government fellowships and maintains information on other sources of aid. Part-time employment of other kinds is available to students both on and off campus.

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 are exempt from out-of-state tuition, but must pay in-state fees according to the schedule for the number of credits taken. (See schedule, p. 77.) The 1969-70 stipends for graduate assistants ranged up to \$2,500 for two semesters, depending on the nature of the assignment and on the hours of work. The 1970-71 stipends are likely to be somewhat higher. See foregoing sections of this bulletin for further details on the stipulations made by the various departments and schools. Inquiries and applications should be addressed to the chairman of the department or the dean of the school in which the assistantship is desired. An official University application form must be filled out and submitted. The student must apply for admission to graduate study, however, before he can be considered for an assistantship.

Graduate students enrolled in degree programs may apply for National Defense Education Act loans through the Financial Aid Office. The Office provides information on eligibility, terms of repayment, and other conditions of the loan program. It also receives applications and administers the program. Information and advice relevant to student loan programs of the State of Michigan and other states may be obtained through this Office.

Oakland University participates in the College Work Study Program



sponsored by the federal government. Under this program students demonstrating need may apply for part-time employment, which will be related, as far as possible, to the fields of their graduate study. Inquiries concerning work under the Program and other part-time campus employment should be directed to the Financial Aid Office. The maximum employment load is twenty hours per week.

Graduate students interested in career-oriented or other off-campus employment may use the services of the Placement Office. Other services of this Office open to graduate students are: occupational guidance and counseling, use of the vocational materials library, and assistance in obtaining career-oriented employment in business, government, education, and other professional fields. Employers regularly register openings with the Placement Office, and many direct referrals are made.

TUITION AND 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 AND TUITION

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

Credits	Michigan Residents*		Out-of-State Residents*	
	Per Credit	Total	Per Credit	Total
21	\$19.50	— \$409.50	\$46.50	— \$976.50
20	19.50	— 390.00	46.50	— 930.00
19	19.50	— 370.50	46.50	— 883.50
18	19.50	— 351.00	46.50	— 837.00
17	19.50	— 331.50	46.50	— 790.50
16	19.50	— 312.00	46.50	— 744.00
15	20.50	— 307.50	48.50	— 727.50
14	21.50	— 301.00	50.50	— 707.00
13	22.50	— 292.50	52.50	— 682.50
12	23.50	— 282.00	54.50	— 654.00
11	24.50	— 269.50	56.50	— 621.50
10	25.50	— 255.00	58.50	— 585.00
9	26.50	— 238.50	60.50	— 544.50
8	27.50	— 220.00	62.50	— 500.00
7	28.50	— 199.50	64.50	— 451.50
6	29.50	— 177.00	66.50	— 399.00
5	30.50	— 152.50	68.50	— 342.50
4	31.50	— 126.00	70.50	— 282.00
3	32.50	— 97.50	72.50	— 217.50
2	33.50	— 67.00	74.50	— 149.00
1	34.50	— 34.50	76.50	— 76.50

* Graduate and undergraduate fees are based upon the same charge per credit hour.

OTHER FEES

PROCESSING FEE

A fee of \$10 must accompany an application for admission to a program. 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 for the first day and \$2 per credit hour on the second and subsequent days.

REPEAT COURSE FEE

No additional fee will be charged to repeat a course.

STUDENT HEALTH FEE

A fee of \$7.50 per semester to cover the use of the student health facility is charged graduate students enrolled for 10 or more credits.

PARKING FEE

Parking of automobiles on campus is regulated by the University's Department of Public Safety. A yearly parking fee of \$16 is payable at the time of registration by those students who will find it necessary to park on campus before 5:00 p.m.

RESIDENT HOUSING: RESERVATIONS, DEPOSIT, FEES

Graduate students interested in University housing can procure information from the Director of Housing, 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 \$499 per semester.

REFUNDS

A student who withdraws voluntarily before the eighth week of the semester will receive a refund of one-half of his course fees. No refund will be given after this time. Housing fees are refunded on a prorated basis.

OUT-OF-STATE TUITION RULES

1. A resident of Michigan (except for aliens) is defined as a

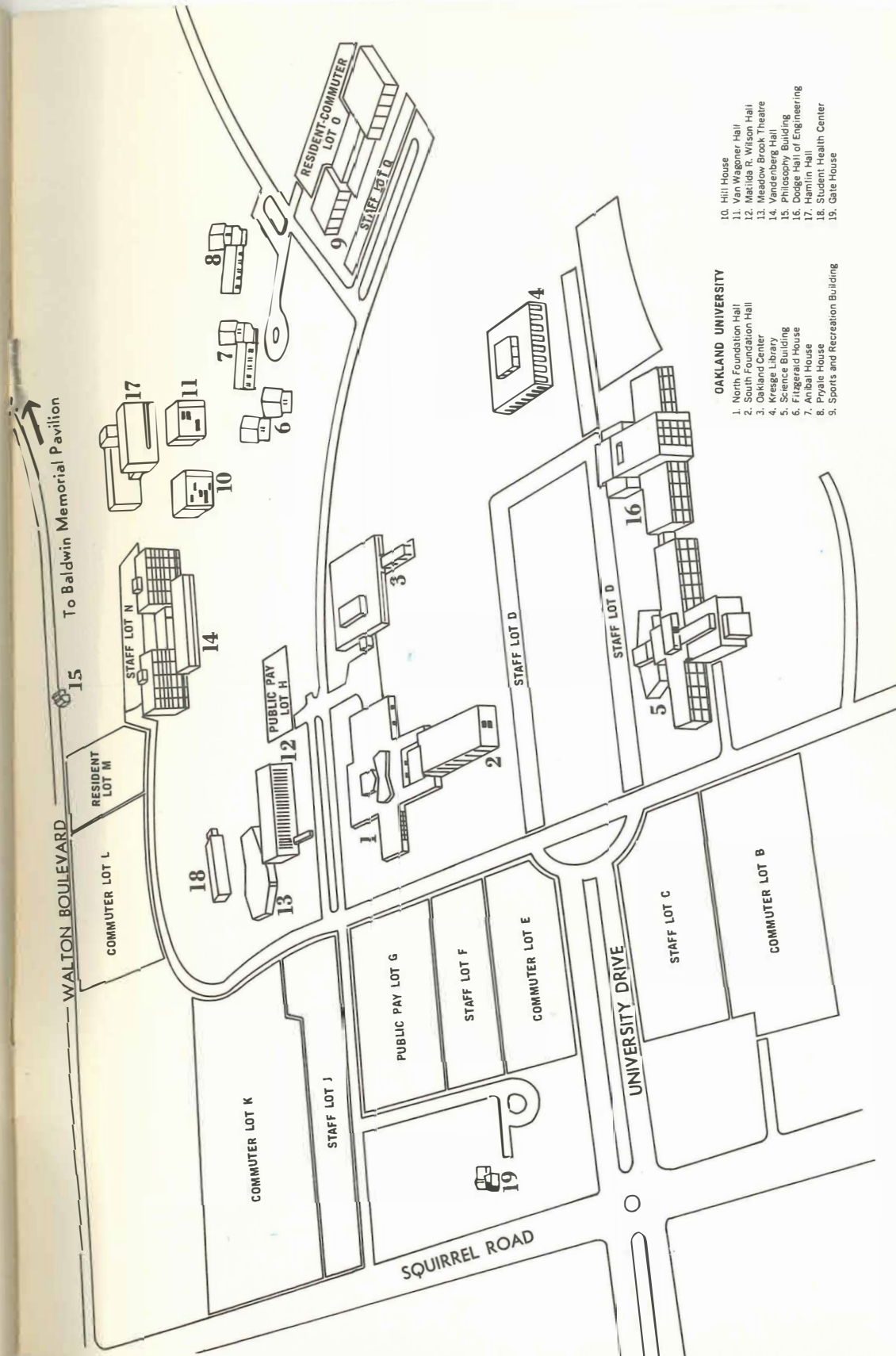
person who has resided in this State for six months immediately preceding his first enrollment.

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 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 payment of University fees shall in no way affect the residence status of the student.



OAKLAND UNIVERSITY

1. North Foundation Hall
2. South Foundation Hall
3. Oakland Center
4. Kresge Library
5. Science Building
6. Fitzgerald House
7. Anibal House
8. Pryle House
9. Sports and Recreation Building
10. Hill House
11. Van Wagner Hall
12. Matilda R. Wilson Hall
13. Meadow Brook Theatre
14. Vandenberg Hall
15. Philosophy Building
16. Dodge Hall of Engineering
17. Hamlin Hall
18. Student Health Center
19. Gate House

15 To Baldwin Memorial Pavilion

WALTON BOULEVARD

RESIDENT LOT M

COMPUTER LOT L

STAFF LOT N

18

COMPUTER LOT K

STAFF LOT J

PUBLIC PAY LOT G

STAFF LOT F

COMPUTER LOT E

19

SQUIRREL ROAD

PUBLIC PAY LOT H

3

STAFF LOT D

4

UNIVERSITY DRIVE

STAFF LOT C

COMPUTER LOT B

16

STAFF LOT D

5

14

10

11

17

6

7

RESIDENT LOT O

9

STAFF LOT R