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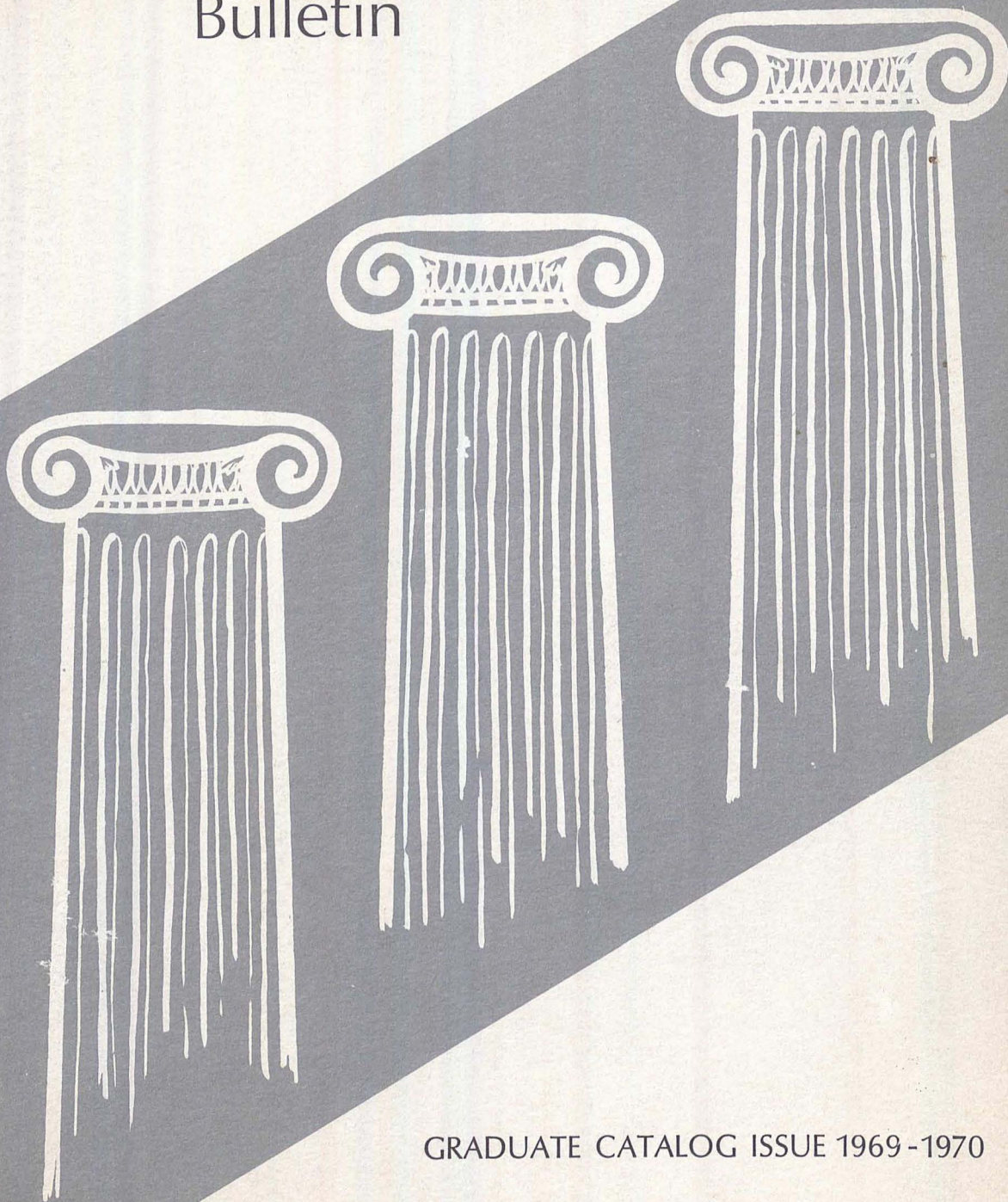
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University of Dayton Bulletin



GRADUATE CATALOG ISSUE 1969-1970



DAYTON, OHIO 45409

THE UNIVERSITY OF DAYTON BULLETIN

VOLUME LXXX

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NUMBER 4

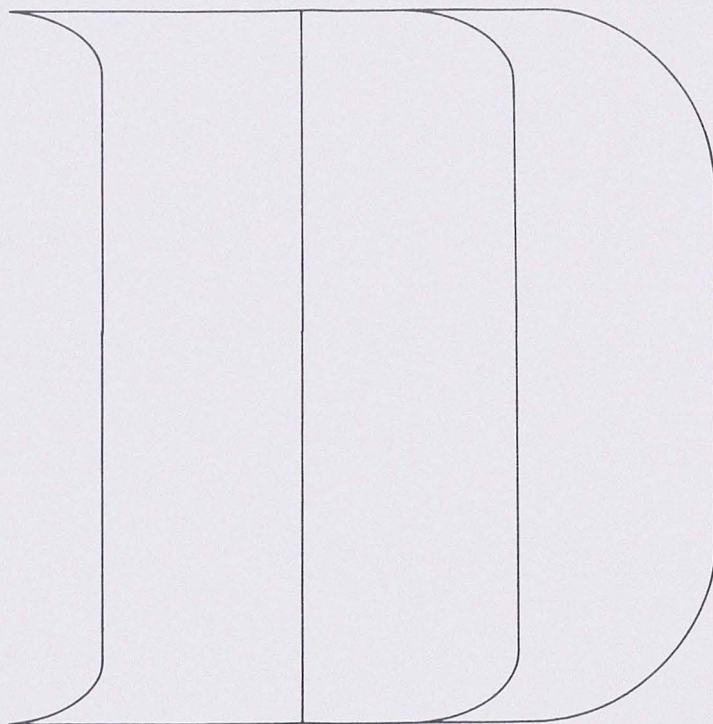
Published by the University of Dayton, 300 College Park Avenue, Dayton, Ohio 45409. Issued five times a year: once in January, twice in March, once in April, and once in June. Second class postage paid in Dayton, Ohio.

The University of Dayton Bulletin includes the admissions catalog issue, the undergraduate catalog issue, the graduate catalog issue, the evening session announcements, and the summer session announcements.

The provisions of the various issues of this Bulletin are to be considered directive in character and not as an irrevocable contract between the student and the University. The University reserves the right to make any changes that seem necessary or desirable.

The current number of any of these publications may be obtained by applying to the office of the Provost.

University of Dayton Bulletin



The Graduate Catalog Issue 1969-70

College of Arts and Sciences
School of Business Administration
School of Education
School of Engineering

DAYTON, OHIO 45409

Academic Calendar

1969-1970

FIRST TERM

Aug. 29	Fri.	Last day to complete registration
Sept. 1	Mon.	Labor Day—no class meetings
Sept. 2	Tues.	Classes begin at 8 a.m.
Sept. 9	Tues.	Last day for change in schedules
Sept. 23	Tues.	Last day to withdraw without record
Oct. 18	Sat.	Homecoming—Graduate and Saturday only classes conducted
Oct. 25	Sat.	Graduate Record Exam (file application 4 weeks in advance)
Nov. 8		National Teacher Exam
Nov. 26	Wed.	Thanksgiving recess begins after the last evening class
Dec. 1	Mon.	All classes resume
Dec. 11-17		Examinations in evening classes conducted during final class meeting
Dec. 15	Mon.	Examinations
Dec. 16	Tues.	Examinations
Dec. 17	Wed.	Examinations—Term ends after the last examination
Dec. 20	Sat.	Diploma exercises

SECOND TERM

Jan. 3	Sat.	Last day to complete registration
Jan. 5	Mon.	Classes begin at 8 p.m.
Jan. 12	Mon.	Last day for change in schedules
Jan. 17	Sat.	Graduate Record Exam (file application 4 weeks in advance)
Jan. 26	Mon.	Last day to withdraw without record
Jan. 31	Sat.	National Teacher Exam
Mar. 25	Wed.	Easter recess begins after the last evening class

1969-1970

Mar. 31	Tues.	All classes resume
Apr. 4	Sat.	National Teacher Exam
Apr. 20-24		Examinations in evening classes conducted during final class meeting
Apr. 21	Tues.	Examinations
Apr. 22	Wed.	Examinations
Apr. 23	Thurs.	Examinations. Term ends after the last examination
Apr. 25	Sat.	Graduate Record Exam (file application 4 weeks in advance)
Apr. 26	Sun.	Commencement exercises

***THIRD TERM (First Session)**

May 6	Wed.	Last day to complete registration
May 8	Fri.	Classes begin at 8 a.m.
May 12	Tues.	Last day for change in schedule
May 19	Tues.	Last day to withdraw without record
June 15-19		Examinations in evening classes conducted during the final class meeting
June 18	Thurs.	Examinations
June 19	Fri.	Examinations—Session ends after the last examination
June 20	Sat.	Examinations—Saturday classes only

*Courses in the MBA program will run from April 28 to June 20

***THIRD TERM (Summer Session)**

June 19	Fri.	Last day to complete registration
June 22	Mon.	Classes begin at 8 a.m.
June 25	Thurs.	Last day for change in schedules
July 2	Thurs.	Last day to withdraw without record
July 11	Sat.	Graduate Record Exam (file application 4 weeks in advance)
July 18	Sat.	National Teacher Exam
July 27-31		Examinations in evening classes conducted during the final class meeting
July 30	Thurs.	Examinations—4 p.m. on
July 31	Fri.	Examinations—Session ends after the last examination
Aug. 2	Sun.	Diploma exercises

*Courses in the MBA program will run from June 22 to August 12



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I General Information

STATEMENT OF PURPOSE

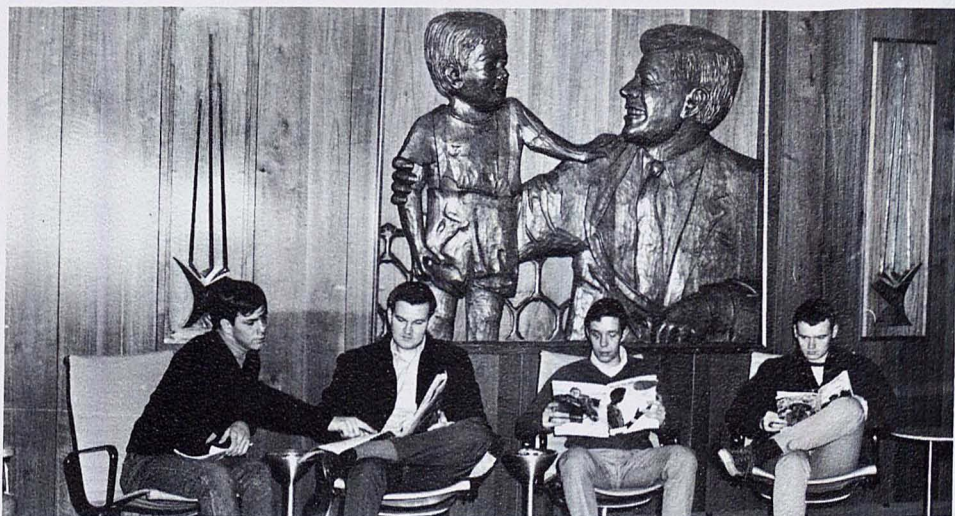
The ultimate purpose of graduate work at the University of Dayton is identical with the general purpose of the University itself, namely, "to provide an academic atmosphere in which Christian principles of thought and action are the essential integrating and dynamic forces impelling the students to pursue, to cherish, and to disseminate what is true, good and beautiful."

The immediate objectives of a graduate school distinguish it from every other type or level of educational institution. Through its faculty, it seeks to create and maintain an academic atmosphere that is essential to graduate work. Its influence, therefore, extends first to its own membership, by promoting all forms of scholarly activity.

It labors further to give its students a thorough grasp of a chosen field of knowledge, special skills in methods of research, and sharpened powers of independent thought. Under the guidance and inspiration of a scholarly staff, students are given the constant use of library, laboratories, and other educational facilities. Above all, a graduate student is expected to bring marked initiative to his work and to assume full responsibility for the progress of his studies. The courses of instruction can be no more than the point of departure and a basis for wide reading and personal investigation.

The number of credit hours demanded for a graduate degree is merely the material requirement; the form and substance of graduate work are conceived as the mastery of a subject-matter with understanding of its relations to kindred branches of knowledge.

In short, graduate work, for the student at the University of Dayton, has for its purpose an integrated program of advanced study based on adequate undergraduate preparation in a specific field of study. It presupposes academic and personal maturity and makes more than average demand upon the initiative, the industry, and the scholarship of the candidates for an advanced degree.



ACCREDITATION

The University of Dayton is officially accredited by the following agencies:

The State of Ohio, Department of Education.

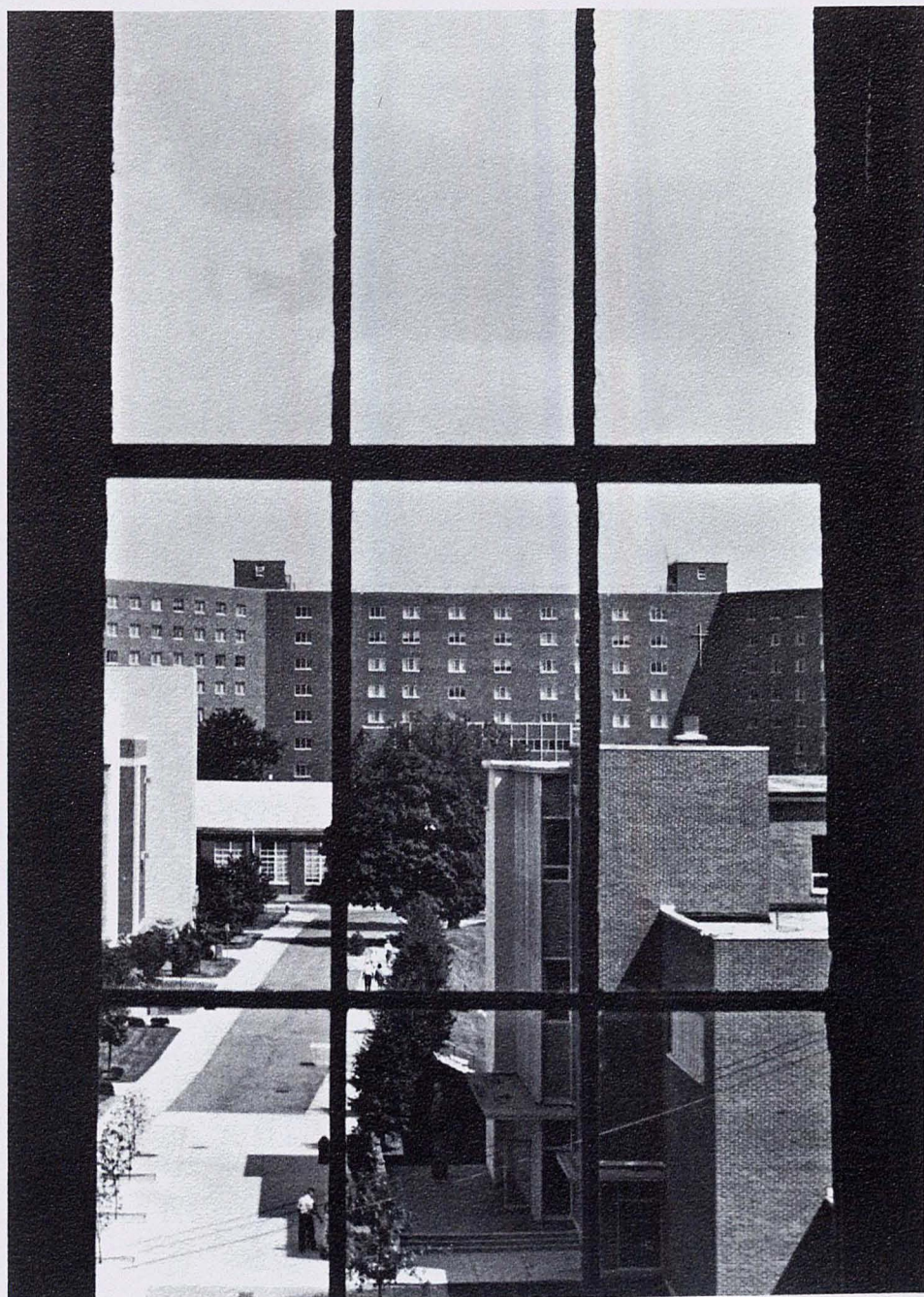
The North Central Association of Colleges and Secondary Schools.

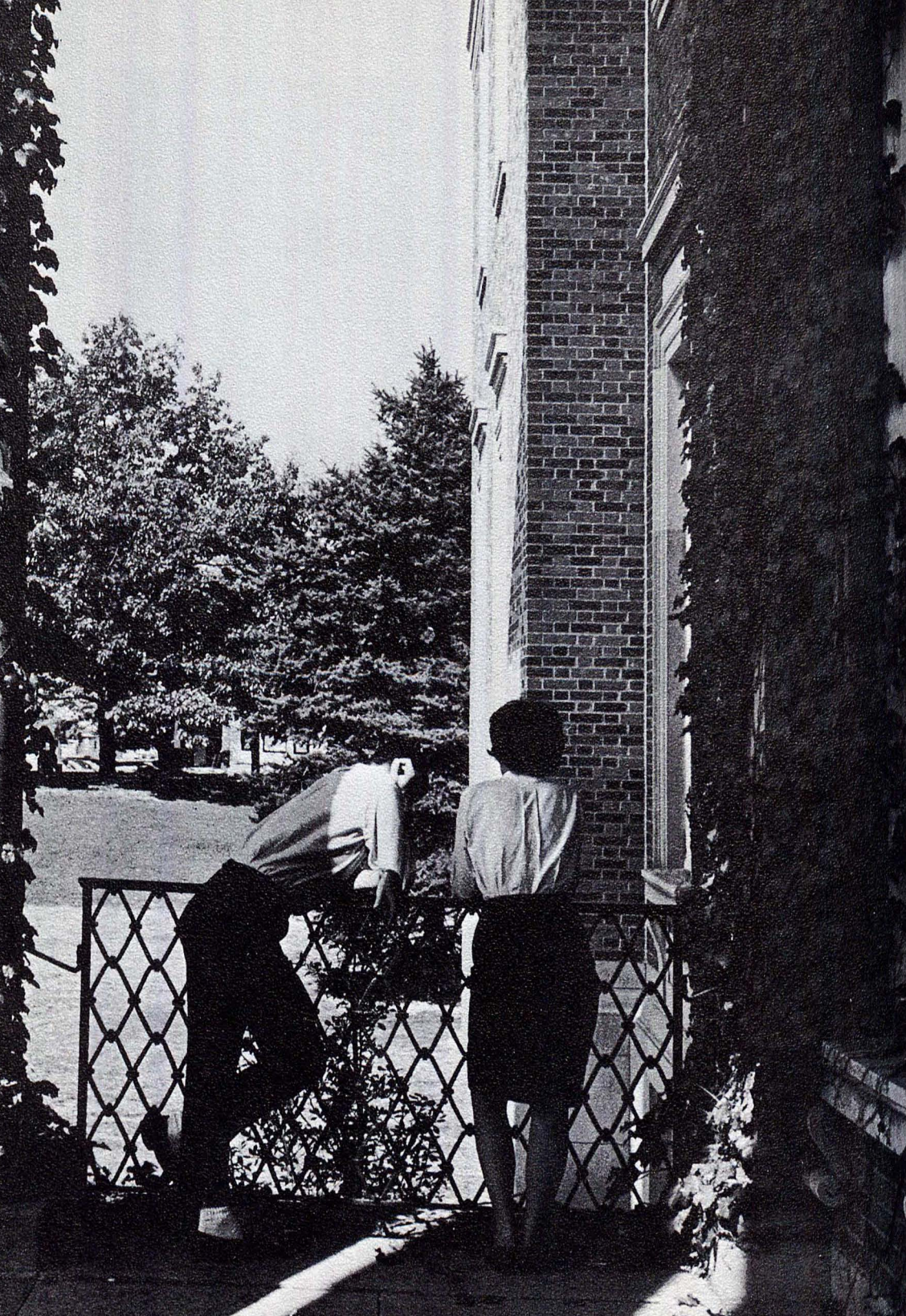
The National Council for Accreditation of Teacher Education (for preparation of elementary and secondary school teachers).

The Engineers' Council for Professional Development for Civil, Electrical, and Mechanical Engineering curricula; also for programs of Electrical, Industrial, and Mechanical Technology in the Technical Institute.

The University has the approval of the American Medical Association for its Pre-Medical program and of the American Chemical Society for its program in Chemistry.

The University holds institutional membership in the following associations: The Association of American Colleges; The American Association of Colleges for Teacher Education; The American Council on Education; The American Society for Engineering Education; Association of Graduate Schools in Catholic Universities; Council of Graduate Schools; The Institute for International Education; The International Council on Education for Teaching; Midwest Conference on Graduate Study; National Association of Foreign Student Affairs; The National Catholic Educational Association; The Ohio Association of Counselor Educators; The Ohio College Association; The Council on Social Work Education; The Ohio Council for the Advancement of Educational Administration; Ohio Council on Advanced Placement.





II Academic Information

ADMISSION

Men and women graduates of approved colleges or universities with a Bachelor's degree are eligible for admission. Applicants must have had an adequate undergraduate preparation in their proposed field of study and must show promise for pursuing higher studies satisfactorily. Additional requirements of specific curricula are noted in their respective portions of this bulletin.

A student is expected to assume full responsibility for knowing the regulations and pertinent procedures of the Graduate School as set forth in this publication and for meeting the standards and requirements expressed by these regulations.

APPLICATION FOR ADMISSION

Inquiries concerning admission and requests for application forms should be addressed to the Office for Graduate Studies or to the office of the Dean of the College or School. The application for admission to graduate work should be submitted by August 1 for the first term, by December 1 for the second term, by April 1 for the third term, and by June 1 for the second half of the split third term. It is the responsibility of the student that his application, with all the necessary supporting documents, be complete and in order before registration if he is to be admitted as a graduate student.

Students from foreign countries may be admitted to graduate courses for which they are prepared and, if found capable, may pursue a program leading to a degree. In addition to the information required of all students, the foreign student must submit an Institute for International Education request for application material form for evaluation before an admission application can be furnished. A foreign student must submit the following information along with his application for admission:

1. Test scores of the Graduate Record Examination (GRE) and the Test of English as a Foreign Language (TOEFL);
2. A medical questionnaire completed by a responsible medical authority certifying that the student's physical, mental, and emotional balance is adequate for the work he intends to undertake.

If the student is accepted he must deposit the sum of \$2,000 with the Treasurer, University of Dayton. This amount is to pay tuition costs for the first year and the balance to help defray return transportation to the student's home. Moreover, the foreign student must carry health insurance and be prepared to pay the first annual premium (\$21.00) upon arrival at the University.

Foreign students should complete the application for admission to graduate work by July 1 for the first term, by November 1 for the second term, by March 1 for the third term. Original inquiries should be made at least one year before the term to which the student seeks admission.

There are no exceptions for foreign students to the above rules.

CLASSIFICATION OF STUDENTS

Regular Status

On regular status are students who have met satisfactorily all the general requirements of the school and the specific requirements of the department in which they are working.

Conditional Status

On conditional status are applicants who must fulfill some prerequisite imposed by the school or department before their admission to regular status. Included likewise are students from foreign countries whose native language is not English and students whose preparation cannot be adequately determined.

Special Status

On special status are students who belong to any of the following categories:

1. Non-programmed students, that is, students who fulfill all the requirements and are taking courses for credit, but are not seeking a degree;
2. Auditors, that is, properly qualified students who wish to follow graduate courses without working for credit. Auditors may be admitted to graduate courses with the permission of, and under the conditions required by the Dean. Tuition for auditors is the same as for students on regular status;
3. Transient students, that is, properly qualified students working toward a degree in another institution who have written authorization from the Dean of that institution to take specific courses at the University of Dayton for transfer of credit. Such students must satisfy all registration requirements in the given course that are mandatory for students working toward a degree at the University of Dayton.

Full Time-Part Time Status

The determination of the status as full or part time of Graduate Assistants, those engaged in research, and in general of all graduate students is made by the respective Dean.

DEGREES

The University of Dayton offers advanced studies leading to a degree of Master of Arts, Master of Business Administration, Master of Public Administration, Master of Science, Master of Science in Education, Master of Science in Engineering, Master of Science in Civil Engineering, Master of Science in Electrical Engineering, and Master of Mechanical Engineering.

SPECIFIC REQUIREMENTS FOR ALL DEGREES

Course Requirements

The College of Arts and Sciences and the Schools of Business Administration, Education, and Engineering offer programs variously distributed in time, leading to the Master's degree. Specific requirements are listed in those sections of this Bulletin which describe these degrees.

Residence Requirements

Residence requirements at the University of Dayton call for the equivalent of time normally demanded by the successful completion of twenty-four credit hours of graduate work. During the initial years of operation of any program, exceptions to this limitation may be made with the approval of the Dean concerned.

Minimum residence time requirement for students attending various combinations of terms is shown in the following table:

COMBINATION of TERMS	MINIMUM RESIDENCE
Students attending <i>ONLY</i> during regular academic year.	Two terms.
Students attending <i>BOTH</i> during regular academic year and third term.	Two terms or one term and two half terms.
Students attending <i>ONLY</i> summer sessions.	For summer sessions, (i.e., four second-half of third term sessions).

The minimum residence time requirement will not in any case be reduced by the acceptance of transfer credit.

Time Limit

All requirements for a Master's degree must be satisfied within seven calendar years from the time of matriculation. (Period of service in the armed forces is not included.)

Graduate Work in Other Institutions

A maximum of two courses of graduate work may be allowed in transfer from other accredited institutions provided the work be of "B" grade quality or better. The quality points are not transferred.

No transfer credit will be allowed for courses taken more than five years previous to matriculation in the graduate schools of the University of Dayton.

During the initial years of operation of any new program, exceptions to this limitation may be made with the approval of the Dean concerned.

Registration of Undergraduate Students for Graduate Courses

An undergraduate student may register for graduate courses only under the following conditions:

- a. Graduate courses to count toward the undergraduate degree.
 1. Approval must be obtained from the Graduate Committee of the particular Graduate School offering the course.
 2. The student's total load must not exceed seventeen (17) hours.
- b. Graduate Courses to count toward the graduate degree.
 1. Approval must be obtained from the Graduate Committee of the particular Graduate School offering the course.
 2. The student must be within fifteen (15) semester hours of completing credit hour requirements for graduation in his undergraduate program.
 3. The student's total load must not exceed seventeen (17) hours.
 4. Credit obtained for the graduate courses may not be counted toward both the Bachelor's and the future Master's degrees.
 5. The graduate tuition rates must be paid when registering in graduate courses for graduate credit.

Language Requirement

A reading knowledge of a foreign language may be required for a Master's degree at the discretion of the Department. Language courses for the convenience of graduate students can be had by special arrangement on a class or tutorial basis, through the Chairman of the Language Department. No graduate credit is allowed for the fulfillment of these language requirements.

Grades and Examinations

Grades are expressed on the student's permanent record in the following manner:

A—Excellent 4 quality points

B—Average	3 quality points
C—Poor	2 quality points
F—Failed	0 quality points
K—Passed	

Credit is given but no corresponding quality points are given. This is used by certain departments when the thesis or special courses are not to affect the 3.0 cumulative quality point average needed to be in good standing.

P—In Progress

For the thesis or for courses which have not terminated at the end of a semester. After the courses or thesis are completed the P's are replaced on the permanent record by an A, B, C, F, or K with the corresponding credit and quality point average.

I—Incomplete

To be used when a course has terminated but the student has not completed his work. The I has 0 quality points per credit and does affect the cumulative quality point average. It can be changed to a letter grade when the student has completed his work.

Mid-Program Approval Form

To be in good standing a graduate student must have a 3.0 quality point average at all times. Midway through the graduate program, at the completion of 15 to 18 hours, the case of each student is reviewed. If the candidate has satisfactorily completed his program up to this point a "Mid-Program Approval Form" is submitted by his Chairman to the Office for Graduate Studies. Some departments also use this time for approving the thesis topic and frequently these departments prefer the term "candidacy."

Comprehensive Examination

A comprehensive examination is required in most programs. The examination may be oral or written, or both. Applications for all comprehensive examinations must be approved by the Chairman of the student's major department at least two weeks prior to the examination. Consult the explanation under each individual program for further details.

Thesis

In those departments requiring a thesis or an equivalent project, the work may not be undertaken without the approval of the Departmental Chairman or of an

advisor delegated by the Dean; both the form and the content of the thesis must have the approval of three members of the Department, including the faculty advisor and the Chairman.

Three final copies of an approved thesis in correct form must be submitted by the student, at least two weeks before graduation. Engineering students check Bulletin section from the School of Engineering.

Theses may not be published, in whole or in part, without the approval of the Administration of the University.

Withdrawals from Courses

Any withdrawal or change of course after the last date of registration is allowed only with written permission. Any change of course or withdrawal must be filed with each office that has a record of the student's admission form.

Use of Advanced Undergraduate Courses in the Graduate Program

1. Some but not all curricula permit the selection of designated upper-division (300-400) courses to be applied to the graduate program.
2. When upper-division courses are permitted for credit on the graduate level, in order to be accepted toward a degree, the work done shall be of "B" grade or better.
3. The graduate tuition rates must be paid when registering for graduate credit.

REGISTRATION

The responsibility for being properly registered rests with the student. Registration is required each term or session of all students who enter course work for credit; and of all students who wish to audit courses. The written approval of the proper dean or the designated advisor is required for admission to any course. Graduate Students must register by mail at least ten days prior to the registration dates listed in the academic calendar. Any student who has interrupted the normal sequence of his graduate program is required to apply to the designated advisor or departmental chairman for permission to resume graduate study, at least two weeks prior to the date assigned for registration.

LIBRARY RESOURCES

The Albert Emanuel Library houses all general holdings plus the concentration of titles in the field of Electrical Engineering.

Specialized libraries are also open to graduate students as follows:

1. Departmental Libraries

- a. Biology, Mathematics, Physics, Psychology . . . Sherman Hall Library, third floor.
 - b. Chemistry, and Chemical, Mechanical, and Civil Engineering . . . Wohlleben Hall Library, third floor.
 - c. Mariology . . . Marian Library, south wing of the Albert Emanuel Library.
 - d. Education . . . Curriculum Library on the first floor of Chaminade Hall.
2. Other Libraries in the Area:

There are several other libraries in the area available to graduate students. These include the public libraries, the Engineers' Club, Miami Valley Hospital, certain local industries, certain areas at Wright-Patterson Air Force Base, and the libraries of the affiliated institutions.

GRADUATE STUDENT ASSOCIATION

All University of Dayton graduate students are invited to be members of the Graduate Student Association. A small membership fee will be requested at the beginning of each academic year. This organization seeks to enhance the value of the academic experience by offering opportunities for graduate students from all fields to associate with one another and to become better acquainted with the faculty.

Through its student officers and committees it sponsors social events as well as discussion sessions, and it represents graduate student interests to the university administration.

SEPARATION FROM THE UNIVERSITY

Separation from the University may follow upon graduation, withdrawal by the student, or dismissal.

The admission of candidates, their continuance and status, the awarding of academic credits, and the granting of a degree, are all subject to the ordinary regulatory powers of the University. It reserves the right to cancel, at its discretion, any of these privileges for reasons considered sufficient by its own governing body.

The various Deans reserve the right to review at intervals the work of their graduate students, and, in consultation with the Chairman of the Department, to recommend that those who are not doing work of a high caliber be advised to discontinue courses leading to a degree.

The disciplinary authority of the University is vested in the President by right, and in the Deans and other officers on whom jurisdiction may be conferred for specific cases and in restricted areas.



III Financial Information

GENERAL REGULATIONS

It is the rule of the University that tuition and fees are to be paid in full at the time of registration.

Where voluntary withdrawal, dismissal, illness, physical disability, or any extraordinary contingencies require a student to leave, he must notify the Dean of the School in which he is enrolled.

VETERANS

Veterans admitted to graduate courses must submit with their formal registration the Certificate of Eligibility for studies by the V.A. under Title 38, United States Code. Lacking the necessary document applicable to his case, the prospective student must register as a non-veteran and pay the required tuition and fees.

Application for benefits under Chapter 33, 34 or 35, Title 38, United States Code, is made at the Veterans Administration in Cleveland, Ohio. Advice and consultation for veterans may be had at the Veterans Service Office of the University of Dayton in St. Marys Hall, room 108.

TUITION AND FEES

Tuition for Courses Taken for Undergraduate Credit

Per registered credit hour for lecture course	\$35.00
Per clock hour for laboratory course.....	22.00

Tuition for Courses Taken for Graduate Credit

Per registered credit hour for lecture course	44.00
Special rate for elementary teachers, high school teachers, and administrators.....	35.00
Per clock hour for laboratory course	(as listed in each bulletin)

Fees

Matriculation fee, payable once.....	10.00
Basic University Fee, each term.....	5.00
(This fee payable only once during the third term.)	

It is anticipated that if the economy continues to rise there will be a corresponding increase in tuition in future years.

A transcript of credits may be requested from the Office of the Registrar. The official transcript may be sent to the institution or organization desiring it or to the student himself. There is a fee of fifty cents for a transcript with less than twelve credit hours. The fee is one dollar for a transcript with twelve or more credit hours. For transcripts ordered in lots of two or more, the fee is one dollar for the first copy and fifty cents for each additional copy. The first copy requested after graduation is a free copy.

CANCELLATION AND REFUNDS

Cancellations will be allowed only after the completion of the proper withdrawal forms. For refund purposes the effective date of cancellation is the date the student notifies the proper Dean's office not the last day the student attended class. This date will appear on the withdrawal forms forwarded to the Treasurer's Office and will determine the amount of refund due.

Students who discontinue class attendance without officially completing the withdrawal procedures during the cancellation period will be responsible for the full amount of the applicable tuition and fees. Those called to military service before the end of a given term should consult with the Treasurer of the University regarding the special regulations that apply in this case.

During the four-week cancellation period for the first and second terms, the tuition charges will be made according to the following schedule:

During the first week of classes.....	20%
During the second week of classes.....	40%
During the third week of classes.....	60%
During the fourth week of classes.....	80%
During and after the fifth week of classes.....	100%

During the two-week cancellation period for each session of the split third term the tuition charges will be made according to the following schedule:

During first week of classes.....	35%
During second week of classes.....	70%
During or after third week of classes.....	100%

Fees of any sort are not refundable. Deposits for breakage are refundable in whole or in part.

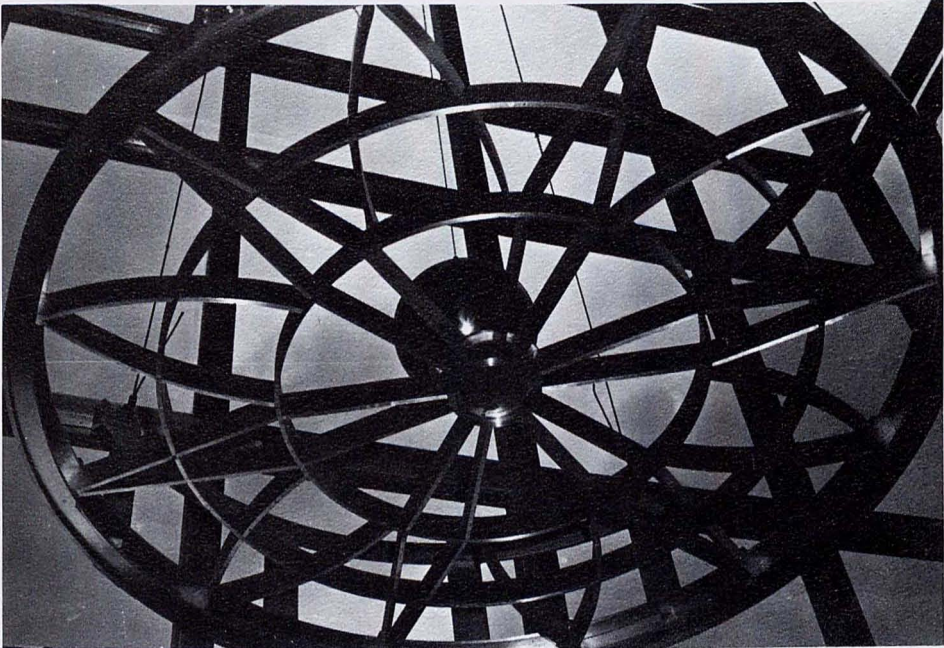
HOUSING

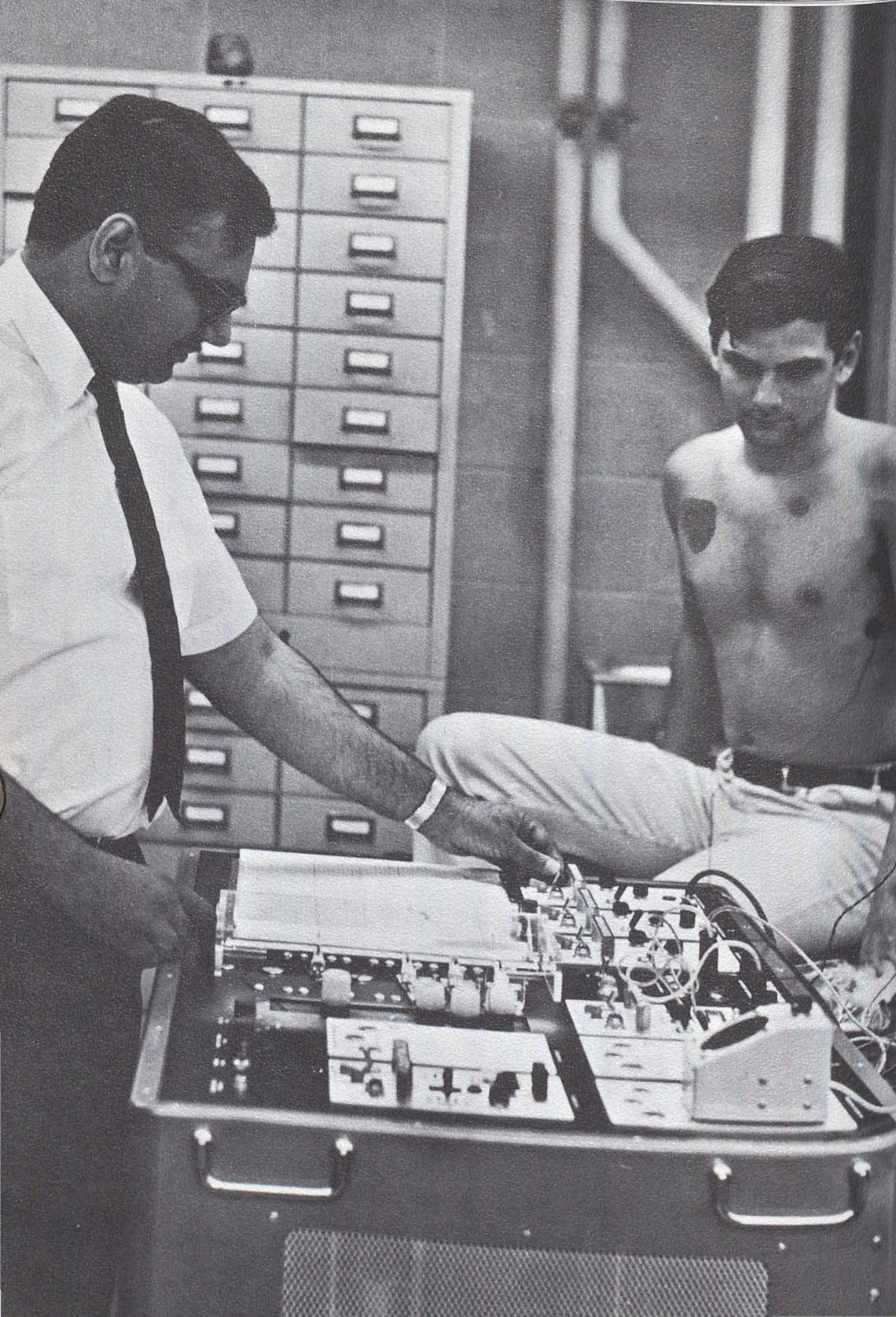
Ordinarily, there are no university-owned accommodations available during the first and second terms. Those interested in obtaining information regarding off-campus housing may contact either the Dean of Women (461-5500, Ext 588) or the Director of Men's Off-Campus Housing (Ext 571), Gosiger Health Center.

FELLOWSHIPS, SCHOLARSHIPS, ASSISTANTSHIPS

A limited number of Research Fellowships and Graduate Assistantships are available to students who are qualified. These carry a stipend and tuition refund provision which enable the recipients to complete the requirements for the degree in a two-year period.

Detailed information and forms for making application may be secured from the Dean of the School in which study is to be done.





IV College of Arts and Sciences

The objectives of graduate work in the Arts and Sciences coincide with the general aims and philosophy of education that characterize the University of Dayton. Specific objectives and requirements of the several departments are presented in the following programs:

THE MASTER'S PROGRAM IN BIOLOGY

Statement of Purpose:

The general objective of graduate work in the Department of Biology is to give the student a basis for a thorough understanding and appreciation of his chosen discipline. Specifically, the graduate program is intended:

- a. To prepare professional biologists.
- b. To qualify the student for academic, industrial and governmental careers in biology.
- c. To equip teachers for scholarly competence in biology.
- d. To prepare the student for further graduate training.

Specific Requirements of the Department:

a. Admission: An applicant is admitted if the Admissions Committee of the Department is satisfied that the applicant is fully qualified to undertake the degree program.

The following undergraduate prerequisites are recommended:

1. A total of twenty-four to thirty credit hours in the field of Biology, of which eighteen to twenty-four credit hours must correspond to the Department's 300-400 course designation.
2. Two semesters each of General Chemistry and Organic Chemistry.
3. Two semesters of Physics.
4. Two semesters of Mathematics.

The graduate student may be required to fulfill undergraduate prerequisites before being admitted to graduate courses for which, in the judgment of the Departmental Committee, he is not qualified.

b. Requirements for the Master's Degree in Biology:

1. Residence. Graduate studies require much more than merely completing more credit hours of course work. While it is possible to fulfill the requirements for the M.S. in Biology as a part-time student, our experience has shown that this is quite difficult. Therefore, we recommend that students in biology attend at least two terms as full-time students. This will enable them to benefit by discussion with the faculty, informal seminars, working with fellow students and participating in the general camaraderie of graduate scholarship and research.
2. A minimum of thirty credit hours of acceptable course work and research. At the discretion of the Chairman, this may include graduate and/or undergraduate courses in both biology and related areas. The graduate student is permitted three to six credit hours for thesis research.
3. While the degree is in biology rather than in a specific field, some amount of specialization is expected. This is determined by the particular interests of the student and accomplished by the selection of courses and the thesis topic.
4. Although the exact courses to be taken will be determined after conferring with the advisor, choice may be in any of the following areas of specialization.

Microbiology

Bacteriology
 Biochemistry
 Bacterial Physiology
 Immunology and Serology
 Virology

Pathogenic Bacteriology
 Parasitology
 Bioinstrumentation
 Cytology
 Non-vascular Plants

Biofunction

Bioinstrumentation
 Radiation Biology
 Plant Physiology
 Endocrinology
 Immunology
 Genetics

Biochemical Genetics
 Biochemistry
 Embryology
 Physiology
 Comparative Animal Physiology

Bioecology

Ecology
Population Ecology
Vertebrate Morphology
Lower Plants
Higher Plants

Invertebrate Zoology
Biometrics
Vertebrate Paleontology
Evolutionary Biology

5. Since advanced undergraduate courses may be taken for graduate credit with the permission of the Chairman, the student is advised to consult the list of courses in the Undergraduate Catalog. Normally, only two advanced undergraduate courses may be counted toward the graduate requirements.
6. A number of credits are common to all programs. These required areas are:

Bio 501 Seminar

2 credit hours

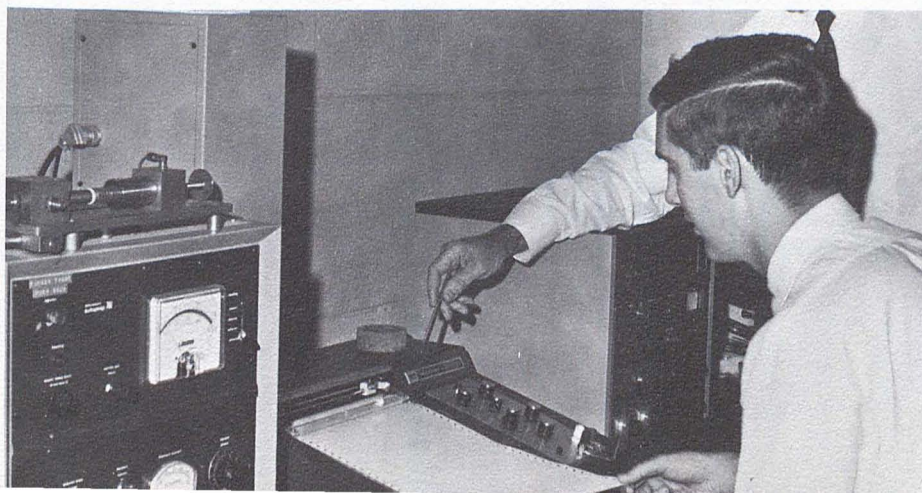
Bio 599 Thesis

3-6 credit hours

Although only two credits are required in Bio 501, Seminar, students are expected to attend and participate in this course each term they are enrolled.

The six credits in Bio 599, Thesis, are taken in two groups of three credits each. The first three credits are earned during the initial stages of literature work, experimental design and establishment of control methods. The actual research and presentation of an acceptable thesis will occupy the final three credits. All thesis work must be under the immediate direction of a member of the graduate faculty.

7. Following the completion of a major portion of the course requirements, the student will take a written and/or oral examination covering general principles of biology and the specific area in which he has concentrated. If this is satisfactory, the final oral examination will consist primarily of a thesis defense.



THE MASTER'S PROGRAM IN CHEMISTRY

Statement of Purpose:

The purpose of the Master's program in Chemistry is to present to the student a rigorous approach to modern theories in Chemistry, and to increase his desire and potential toward fundamental research through a program of literature search and laboratory experimentation.

Specific Requirements of the Department:

a. Undergraduate prerequisites: The undergraduate prerequisites shall be the minimum requirements specified by the American Chemical Society. Those students who have graduated from A.C.S. approved schools will have fulfilled these requirements. Others may have to take certain courses concurrently from the undergraduate program to meet A.C.S. requirements.

b. Undergraduate courses open to graduate students: Credit for certain undergraduate non-Chemistry electives may be allowed at the discretion of the Chairman of the Department.

c. Twenty-four credit hours of course work and six hours of research are normally required for the Master's degree in Chemistry. The twenty-four course credits must include three credits in each of the major fields of organic, physical and inorganic chemistry.

d. Electives in other departments may be chosen with the approval of the Chairman of the Department of Chemistry.

THE MASTER'S PROGRAM IN ENGLISH

Statement of Purpose:

The Master's program in English is designed to offer the opportunity for an intensified study of English and American literature, and to develop in the student a competence in independent research and in the exercise of sound literary judgment.

Specific Requirements of the Department:

a. Undergraduate prerequisites: The student seeking admission must have completed studies in English and American literature which will enable him to pursue his graduate studies with distinction. He will ordinarily have completed, with a grade point average of at least 3.00, twenty-four semester credit hours in literature, of which at least eighteen hours were in upper-division courses. Graduate Record Examination scores may be required as part of the applicant's materials.

b. Specific degree requirements: Two options are possible:

Option A: Twenty-four credit hours of course work, a thesis for which six hours are granted, a language examination, and a special examination in the area of the thesis.

Option B: Thirty credit hours of course work which culminates in a written comprehensive examination.

Neither option is regarded as a terminal master's. The selection would depend upon the student's preparation, interest and vocational objective.

c. Obligatory core courses: Eng 595, Research and Bibliography, to be taken in the first term in which it is offered, and Eng 592, Philosophical and Critical Foundations of Literature, are required of all applicants for the degree.

d. Occasionally and only by permission of the Chairman, certain of the 400-level course offerings in English, up to six hours maximum, can be included in the master's program if taken by a student enrolled in the graduate program. These are the 400-level courses listed in the University catalog.

e. Credit hours in an allied field: Six semester credit hours may be taken in an allied field upon approval of the Chairman of the Department.

f. Thesis: A thesis upon a topic approved by the Graduate Committee of the Department is required of all students who elect Option A.

g. Language requirements: Students electing Option A must demonstrate a reading knowledge of one foreign language. French or German is preferred.

h. Comprehensive examination: All students electing Option B must pass a written comprehensive examination upon six of seven periods of English and American literature. Detailed instructions concerning this examination may be obtained from the Chairman.

Course Offerings:

Courses will be offered during the late afternoons or evenings and on Saturday mornings during the First, Second, and first half of the Third Term and during the evening and in the day in the second half (the summer session) of the Third Term.

THE MASTER'S PROGRAM IN HISTORY

Statement of Purpose:

The Department of History through its graduate program seeks to develop in the student that combination of mature judgment and scholarly competence associated with the ability to make, compare, test, and evaluate historical conclusions and interpretations.

As a secondary purpose, the program is designed to prepare the student for a successful career in teaching, government services, or specific fields of private endeavor.

Specific Requirements of the Department:

a. Undergraduate prerequisites: Applicants for the graduate program in History must have completed a total of twenty-four semester credit hours of History, and must have achieved a grade point average of at least 3.00 in all History courses.

b. Undergraduate History courses on the 300 and 400 level may be taken for graduate credit to a maximum of six credit hours. Courses for which undergraduate credit has been received may not be repeated for graduate credit.

c. Courses required of all students in the Master's Program in History:

Hst 500 Historiography

Hst 550 The Philosophy of History

Hst 545 Seminar in Non-American History

or

Hst 595 Seminar in American History

d. Requirements for the Master's degree in History:

OPTION A:

1. Thirty credit hours of acceptable course work including nine credits of required courses (See c above) and six credit hours for thesis (Hst 599).
2. A reading knowledge of one foreign language (usually French, German, or Spanish).
3. An oral comprehensive examination which must be passed at least three weeks prior to the date of graduation.

OPTION B:

1. Thirty-three credit hours of acceptable course work including nine credits of required courses (See c above).
2. A written comprehensive examination which must be passed at least three weeks prior to the date of graduation.
3. This program is recommended only for students for whom the Master's degree is to be considered a terminal degree.

e. Six credit hours may be taken in an allied field, such as Education, English, Philosophy, Theology, etc., upon approval by the chairmen of both departments.

Course Offerings:

Courses will be offered in the late afternoon and evening hours for the convenience of teachers and other employed persons except during the Third Term, Second Session, when courses will be offered in the morning hours only.

Students who wish to do so may register for the 300- and 400-level courses in the full time undergraduate program. No more than six credits of such courses may be taken for graduate credit.

THE MASTER'S PROGRAM IN INFORMATION SCIENCE*Statement of Purpose:*

The Master of Science in Information Science program provides the training needed to attack problems men face in organizing and controlling mass amounts of data generated and used by individuals and institutions. The program provides an integrated outlook for the application of computer, psychological and engineering principals to the receipt, classification, communication, cataloging, storing, retrieval, presentry and use of data regardless of its subject matter. The program will provide cross-discipline training in the underlying concepts of information and its use as it relates to various fields, particularly to behavioral sciences, information processing, management, and communication technologies. Human parameters of the information process are emphasized.

Individuals completing the program are expected to be sufficiently trained to cope with problems emerging in the development and implementation of information handling systems in general and computer based systems in particular. Examples of such systems are automated library environments, military command and control, community data systems, medical diagnostic, and computerized educational systems.

Student Status

Each student admitted to the Graduate Program is placed in one of the following categories as defined.

a. *Regular Standing*

Student meeting all the entrance requirements of the department.

b. *Conditional Standing*

1. Students in this status are required to complete admission requirements as to preliminary examinations (GRE), letters of recommendation, or specific courses as determined by the Department.
2. Students are considered as probationary pending the results of nine to fifteen hours of graduate work.

c. *Special Standing*

Students enrolled in graduate courses of the department who may not be necessarily working for a degree.

Candidacy

A graduate student becomes eligible for candidacy when in the judgment of his advisor he has adequately demonstrated ability to satisfy the requirements stipulated in the program for which he was accepted. On the student's part, application for candidacy signifies the intention to complete the degree requirements at the University of Dayton.

Time Limit

The program must be completed within seven years after matriculation. (Period of service in the Armed Forces not included.)

Specific Requirements of the Department

a. Undergraduate prerequisites:

1. Completion of Differential and Integral Calculus
2. Semester of Statistics
3. 3.0 point average in major (behavioral, physical science, or engineering)
4. Knowledge of computer language, preferably ALGOL or Fortran.

b. Specific course requirements for the degree:

1. Students are required to complete 36 credit hours in the following areas:

9 credit hours in Behavioral Theory
9 credit hours in Computer Science
9 credit hours in Engineering
9 credit hours in Basic Science

According to the background of the students, however, substitution in the above hours and field requirements can be made.

2. All students are required to register for the graduate seminar (ISc 590) during the first and second terms each year they are in the program.
3. Minimum B average in course work.
4. Passing of a written comprehensive examination.
5. Thesis and oral examination of thesis.

Courses of Instruction:

The following courses meet the requirements in the respective areas outlined. Depending on the undergraduate background of the student, the student may, upon

approval of his advisor, substitute different concentration of courses to insure a balanced program of professional training required of an Information Scientist.

a. Behavioral Theory Segment 9 credit hours

- ISc 525 Foundations of Behaviorial Theory (3)
- ISc 553 Information Presentation (3)
- ISc 565 Sociology of Information Systems (3)
- ISc 570 Human Communication (3)
- ISc 571 Man-Machine Communication (3)
- ISc 576 Computational Linguistics
- ISc 580 Human Information Processing (3)
- Psy 508 Advanced Experimental Psychology (3)
- Psy 530 Learning
- Psy 531 Learning Theory
- Psy 532 Theories of Perception*
- Psy 533 Decision Processes (3)
- Psy 541 Computer Applications to Behaviorial Science (3)

b. Computer Science Segment 9 credit hours

- ISc 510 Computers and Research Design (3)
- ISc 510L Computers and Research Design Laboratory (1)*
- ISc 576 Computational Linguistics (3)
- Cps 399 Special Problems in Computer Science (1-3)
- Cps 481 Mathematical Logic (3)
- Cps 499 Special Topics (3)
- Ele 501 Analog and Digital Computers (3)

c. Basic Science (Methods) Segment 9 credit hours

- ISc 501 Introduction to Information Science (3)
- ISc 503 Introduction to Cybernetics (3)*
- ISc 510 Computers and Research Design (3)
- ISc 510L Computers and Research Design Laboratory (1)*
- ISc 515 Mathematics and Information Science (3)
- ISc 516 Advanced Statistical Application to Information Science (3)
- ISc 520 Communication Theory (3)
- ISc 550 Information System Technology (3)
- ISc 560 Organization and Retrieval of Information (3)
- ISc 570 Human Communication (3)
- ISc 575 Artificial Intelligence (3)

- ISc 576 Computational Linguistics (3)
- Ine 430 Engineering System Design (I) (3)
- Ine 521-2 Operations Research, I and II (3-3)
- Ine 544 Systems Analysis, Design and Evaluation (3)
- Cps 367 Statistics (3)
- Psy 501 Advanced Statistics (3)

d. Engineering Segment

9 credit hours

- ISc 550 Information System Technology (3)
- ISc 553 Information Presentation (3)
- ISc 571 Man-Machine Communication (3)
- ISc 575 Artificial Intelligence (3)
- Ine 421 Reliability Theory (3)
- Ine 422 Reliability Application (3)
- Ine 430 Engineering Systems Design (I) (3)
- Ine 502 Simulation Techniques in Operations Research (3)
- Ine 509 The Engineering Management (3)
- Ine 521-2 Operations Research, I & II (3-3)
- Ine 525 Reliability (3)
- Ine 544 Systems Analysis, Design & Evaluation (3)
- Ele 515/Egr. 525 Automatic Control Theory (3)
- Egr. 525 Automatic Control Theory (3)

THE MASTER'S PROGRAM IN MATHEMATICS

Statement of Purpose:

The Department proposes to offer graduate studies in Mathematics in order to give an opportunity for properly prepared persons to acquire skills in those branches of Mathematics normally studied after the Baccalaureate degree. The curriculum is intended to serve as a firm basis for doctoral studies and research.

Specific Requirements of the Department:

a. Undergraduate prerequisites:

- Mth 229 Differential Equations (or equivalent)
- Mth 361 Introduction to Abstract Algebra
(or equivalent)
- Mth 421-2 Advanced Calculus (or equivalents)

b. Graduate requirements:

The candidate selects his courses under the guidance of the Chairman.

He should have a proficiency in the following areas: Real and Complex Analysis, Algebra, and Topology.

c. Requirements for the Degree:

1. Thirty course hours: These may include 6 hours of undergraduate courses chosen from Mth 411, 412, 413, Probability and Statistics, I, II, and III; a maximum of 6 hours of approved courses outside the department; a maximum of 6 hours for a thesis in special cases.
2. A written examination in the three areas of analysis, algebra and topology must be passed successfully within three months of the expected date of graduation.
3. An oral examination must be passed successfully within a month of the expected date of graduation.
4. Although no foreign language is required, a student may be expected to read assigned papers in German or French.

THE MASTER'S PROGRAM IN PHILOSOPHY

Statement of Purpose:

The purpose of the graduate program in Philosophy is to provide an atmosphere for independent study and research, in which the student can gain a more comprehensive knowledge and deepen his understanding of the major philosophical positions, develop his powers of critical analysis and his ability to apply philosophical principles to the solution of present-day problems.

Students working toward the Master of Arts degree in Philosophy will be subject to the general requirements of the College of Arts and Sciences program and to the specific requirements given below.

Specific Requirements of the Department:

a. Undergraduate Prerequisites: For a Master's degree in Philosophy, the student must have had at least twenty-four credit hours in undergraduate philosophy.

b. Advanced Undergraduate Courses Open to Graduate Students: Normally only one course will be permitted. In exceptional cases the Director of graduate studies could give permission for a second course. It is understood, however, that any graduate student taking an approved undergraduate course must give evidence of a deeper and more mature knowledge of this course than a regular undergraduate. Offerings will be restricted to the following courses:

- Phl 406 History of Greek Philosophy
- Phl 407 History of Medieval Philosophy

- Phl 408 History of Modern Philosophy
- Phl 409 History of Recent Philosophy
- Phl 430 Philosophy of Plato
- Phl 432 Philosophy of Aristotle
- Phl 434 St. Thomas Aquinas
- Phl 436 Descartes
- Phl 438 Kant
- Phl 440 Hegel

c. Requirements in Terms of Credit Hours for an M.A. in Philosophy: The student must take a minimum of thirty hours in graduate work, six of which are given for a thesis.

d. Graduate Courses Required: Every graduate student must take the three core courses: Phl 500, Phl 501, and Phl 502. The Chairman or the Director of Graduate Studies in Philosophy can waive one or more required courses on the following conditions:

- The student has already taken equivalent graduate courses at the University of Dayton.
- The student's undergraduate record indicates a good background on the given area. In this case the student will be asked to pass an oral or written test that will evidence a sufficient knowledge on the matter.

e. Thesis Requirement: A written thesis will be required of all students in this program. An outline of the thesis should be submitted by the student to his approved thesis director no later than the completion of his first twelve hours of graduate work. Three copies of the completed thesis will be submitted at least six weeks prior to the expected graduation date. The student must be prepared to make an oral defense of thesis no later than two weeks prior to graduation.

f. Comprehensive Examination: Each student must take a written comprehensive examination in partial fulfillment of the requirement for the degree. The examinations will be administered on the last Monday of November, March and June. The student taking the comprehensive must have completed his three core courses.

g. Language Requirement: All graduate students of Philosophy are strongly urged to learn at least one or two foreign languages as a means to improve their professional skills. However, there is no mandatory requirement of any language for their Master program at this University. Nevertheless, any student who should decide to take the language examination could do so and, if approved, will have this examination in his official records.

Courses of Instruction:

A distinctive feature of the graduate program in Philosophy is the emphasis on the continuity of philosophic inquiry from the ancient and medieval era to the modern period. Each graduate student will arrange his program upon consultation with the Director of graduate studies in Philosophy.

Core Courses:

- Phl 500 Plato and Aristotle in Ancient Philosophy
- Phl 501 St. Thomas and St. Augustine in Medieval Philosophy
- Phl 502 Descartes and Kant in Modern Philosophy

Elective Courses:

- Phl 503 Philosophy of Man
- Phl 510 Philosophy of Science
- Phl 540 Aristotle's *De Anima* and St. Thomas' Commentary
- Phl 541 Texts of Plato
- Phl 542 Texts of Aristotle
- Phl 543 Texts of Presocratic Philosophers
- Phl 545 Modern French Philosophy
- Phl 550 Philosophy of History
- Phl 553 Kantianism I
- Phl 554 Kantianism II
- Phl 555 Modern German Philosophy
- Phl 560 Modern British Philosophy
- Phl 565 American Pragmatism
- Phl 570 Existentialist Philosophy
- Phl 575 Contemporary Philosophies of Evolution
- Phl 580 Contemporary Naturalism and Realism
- Phl 585 Phenomenology
- Phl 590 Directed Studies
- Phl 591 Seminar
- Phl 592 Analytic Philosophy
- Phl 594 Symbolic Logic

THE MASTER'S PROGRAM IN PHYSICS*Statement of Purpose:*

Basically the Master's program in the Department of Physics serves the stated purpose of the University by giving the student a thorough understanding and appreciation of his chosen discipline. Advanced study in physics may be used in several immediate ways:

- a. To prepare for an advanced degree (Ph.D.) program;
- b. To qualify the student for research and development careers in industry and government;
- c. To enrich the backgrounds of teachers of physics on the secondary school level.

Specific Requirements of the Department:

a. Undergraduate requirements: An applicant will be admitted to advanced study in physics if the graduate admission committee of the Department determines he is qualified to take the degree program. In general, a properly prepared student should have the following background:

1. Physics courses which are approximately the equivalent of University of Dayton courses.

Phy 303-4 Intermediate Mechanics

Phy 408-9 Advanced Electricity & Magnetism

Phy 301 Thermodynamics

Phy 390 Introduction to Quantum Mechanics

Phy 421 Nuclear Physics

2. Mathematics through Differential Equations and preferably Advanced Calculus.

The applicant will be required to make up any deficiencies which the Department deems necessary to bring him to the level of the graduate course.

b. Specific requirements for the degree: The formal requirements for the degree are thirty credit hours of course work properly distributed plus examinations and possibly a thesis as indicated in the following:

1. The "core sequence" normally required of all degree students.¹

Phy 511	Classical Mechanics	three credit hours
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Phy 515	Statistical Mechanics	three credit hours
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Phy 523	Electromagnetic Theory I	three credit hours
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Phy 524	Electromagnetic Theory II	three credit hours
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Phy 525	Quantum Mechanics I	three credit hours
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Phy 526	Quantum Mechanics II	three credit hours
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2. Other recommended Graduate courses in physics.

Phy 512	Classical Theory of Fields	three credit hours
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Phy 520	Advanced Solid State Physics	three credit hours
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Phy 521	Advanced Nuclear Physics	three credit hours
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Phy 531	Advanced Graduate Laboratory	three credit hours
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¹Substitutions may be made with the approval of the Chairman of the Department.

3. Courses in related disciplines.

These may be chosen in related fields, mathematics, chemistry, etc. up to a maximum of six credit hours with the approval of the Chairman of the Department.

4. Advanced undergraduate courses.

A maximum of six credit hours of graduate credit may be granted for advanced undergraduate courses which are approved by the graduate student's Faculty Advisor.

NOTE: Courses for which undergraduate credit has been allowed may not be repeated for graduate credit.

5. Thesis credit.

A Master's degree thesis is recommended for those students who have no comparable experience. An oral examination before a committee designated by the Chairman of the Department must be passed before credit can be given. A maximum of six credit hours can be given for thesis work.

6. Comprehensive examinations.

A three-hour written and one-hour oral examination in the general field of physics is given under the direction of the student's Faculty Advisor. This examination must be passed satisfactorily by the candidate for a Master's degree.

7. Language requirement.

No specific language requirement is necessary for the degree of Master of Science in Physics.

THE MASTER'S PROGRAM IN POLITICAL SCIENCE

Statement of Purpose:

The Department of Political Science offers graduate students the opportunity for advanced study of governmental structures, processes, and theory within an integrated disciplinary context. The programs propose to develop professional competence and the research skills necessary to productive participation in the discipline.

Specific Requirements of the Department:

a. Undergraduate prerequisites: An applicant is admitted to graduate study if the admitting committee of the Department is satisfied that the applicant is fully qualified to undertake graduate study. Applicants may submit credentials in any substantive field.

b. Required course: One course in Political Theory is required for all master's degrees.

c. Specific requirements for the Master of Arts: Thirty hours of graduate credit, which may include six to nine hours in courses taken in an allied field. A comprehensive examination is required. A thesis, evaluated at six semester hours, may be written under the direction of a member of the faculty. If a thesis topic requires command of a foreign language, computer technology, or another tool of research, the candidate will be required to demonstrate competence in its use.

d. Specific requirements for the Master of Public Administration: Thirty hours of graduate credit, including the required core course. A candidate who has not had government experience at an administrative level must complete two terms of Pol 595, Government Internship. An applicant who wishes a research-oriented program in public administration should take the M.A. program with thesis.

A candidate may take up to six or nine hours in a cognate field related to his administrative or professional interests. A written comprehensive examination is required at the completion of the course work.

e. Under the general University regulations regarding transfer credit, an applicant may transfer six semester hours of graduate studies from another university under certain conditions. Courses taken in an accredited law school may be transferred under the same conditions.

THE MASTER'S PROGRAM IN PSYCHOLOGY

Statement of Purpose:

The Department of Psychology offers three graduate programs.

The Master of Arts program in Clinical Psychology is designed to prepare the student for further graduate work at the Ph.D. level, or to enable him to secure interim employment in a wide variety of clinical settings.

The Master of Arts program in Experimental Psychology prepares the student for duties as research psychologist in government, industry and the University. The objective of the program is to develop a capability to plan, conduct and report on experimental methodology and theory applied to human behavior. The laboratory and course work is preparatory to advanced degrees.

The Master of Arts degree in General Psychology is designed to prepare the student for teaching at the college or junior college level, or for certain subdoctoral professional activities requiring cross area specialization. Applicants admitted with special permission of the Graduate Committee.

Student Guidance

The student enrolled in the graduate program of the department is provided with

the *Student's Guide to Graduate Study in the Department of Psychology*. The Guide provides specific elaboration of the procedures to be followed by the student in completing his graduate studies.

Student Status

Each student *admitted* to the Graduate Program is placed in either of the following categories as defined.

- a. *Regular Standing*
Student meeting all the entrance requirements of the department.
- b. *Conditional standing*
 1. Students in this status are required to complete admission requirements as determined by the department.
 2. Students are considered as *probationary* pending the results of nine to fifteen hours of graduate work.
- c. *Special Standing*
Students enrolled in graduate courses of the department who may not be necessarily working for a degree.

Candidacy

A graduate student becomes eligible for candidacy when in the judgment of his advisor he has adequately demonstrated ability to satisfy the requirements stipulated in the program for which he was accepted. On the student's part, application for candidacy signifies the intention to complete the degree requirements at the University of Dayton.

Time Limit

The program must be completed within seven years after matriculation. (Period of service in the Armed Forces not included.)

Specific Entrance Requirements for all Programs

Undergraduate prerequisites for admission as a regular student:

1. Three credit hours of College Algebra
2. 3.0 point average in Psychology
3. As a minimum, 3 credit hours in Experimental Psychology and 3 hours in Statistics, plus 6 hours in upper level Psychology.

Course Requirements for Degree in Respective Programs

- a. Master of Arts in Psychology (Clinical)
 1. Formal Requirements

a. 41 credit hours of course work including thesis.

b. Minimum B average in course work.

c. Passing of a comprehensive examination.

Details on the examination are included in the *Student's Guide to Graduate Study*.

d. Thesis and oral examination of Thesis.

2. Course Requirements

Psy 501 Advanced Statistics (3)

Psy 515 Assessment of Intelligence (4)

Psy 516 Projective Techniques (4)

Psy 518 Social Adaptation (3)

Psy 519 Practicum in Projective Techniques (3)

Psy 535 History and Systems of Psychology (3)

Psy 560 Theories of Personality (3)

Psy 561 Clinical Psychology (3)

Psy 564 Theories of Psychotherapy (3)

Psy 566 Clerkship (3)

Psy 590 Mathematical Psychology (3)

Psy 596 Experimental Research (3)

Psy 599 Thesis (3)

b. Master of Arts in Psychology (Experimental)

1. Formal Requirements

a. 33 credit hours of course work including thesis.

b. Minimum B average in course work.

c. Passing of a comprehensive examination.

Details on the examination are included in the *Student's Guide to Graduate Study*.

d. Thesis and oral examination of Thesis.

2. Course Requirements

Psy 501 Advanced Statistics (3)

Psy 530 Learning (3)

Psy 532 Theories of Perception (3)

Psy 535 History and Systems of Psychology (3)

Psy 565 Psychophysiology (3)

Psy 590 Mathematical Psychology (3)

Psy 596 Experimental Research (6)

Psy 599 Thesis (3)

Psy — Electives with permission of the advisor (6)

c. Master of Arts in Psychology (General)

1. Formal Requirements

- a. 33 credit hours of course work including thesis.
- b. Minimum B average in course work.
- c. Passing of a comprehensive examination.
Details on the examination are included in the *Student's Guide to Graduate Study*.
- d. Thesis and oral examination of Thesis.

2. Course Requirements

- Psy 501 Advanced Statistics (3)
- Psy 535 History and Systems of Psychology (3)
- Psy 596 Experimental Research (3)
- Psy 599 Thesis (3)
- Psy — Electives (selected concentration with permission of Advisor) 21

THE MASTER'S PROGRAM IN THEOLOGICAL STUDIES

Statement of Purpose:

The graduate program in Theological Studies is conceived as a broad comprehensive approach to the study of Religion and Theology. Its major concern is to develop in the degree candidate a methodology whereby he may approach the field with five major concerns: a solid grasp of Sacred Scripture, the historical development of western theological thought, the comparative study of world religious phenomena, an ecumenical awareness, the establishment of an interdisciplinary mentality. The program is conceived both as a preparation for specialization on the doctoral level and as a terminal program for those with other interests and needs.

The unique facilities afforded by the Marian Library allow the offering of special electives in Mariology.

Specific Requirements of the Department:

a. Undergraduate prerequisites: An applicant is admitted to graduate study if the admitting committee of the Department is satisfied that the applicant is fully qualified to undertake graduate study. The applicant will be required during his first term of residence to make up any deficiencies which the Department deems necessary to bring him to the level of graduate studies.

b. Specific course requirements for the degree: The candidate must take a minimum of thirty-three hours of course work. The student must take six or seven courses in one program area and four or five courses in the other areas. The program areas are:

1. Scripture, either Old Testament or New Testament
2. Historical Theology
3. Systematic Theology

c. With permission undergraduate courses on the 300 and 400 level in Theological Studies and in Judaics may be taken for graduate credit to a maximum of six credit hours. Courses for which undergraduate credit has been received may not be repeated for graduate credit.

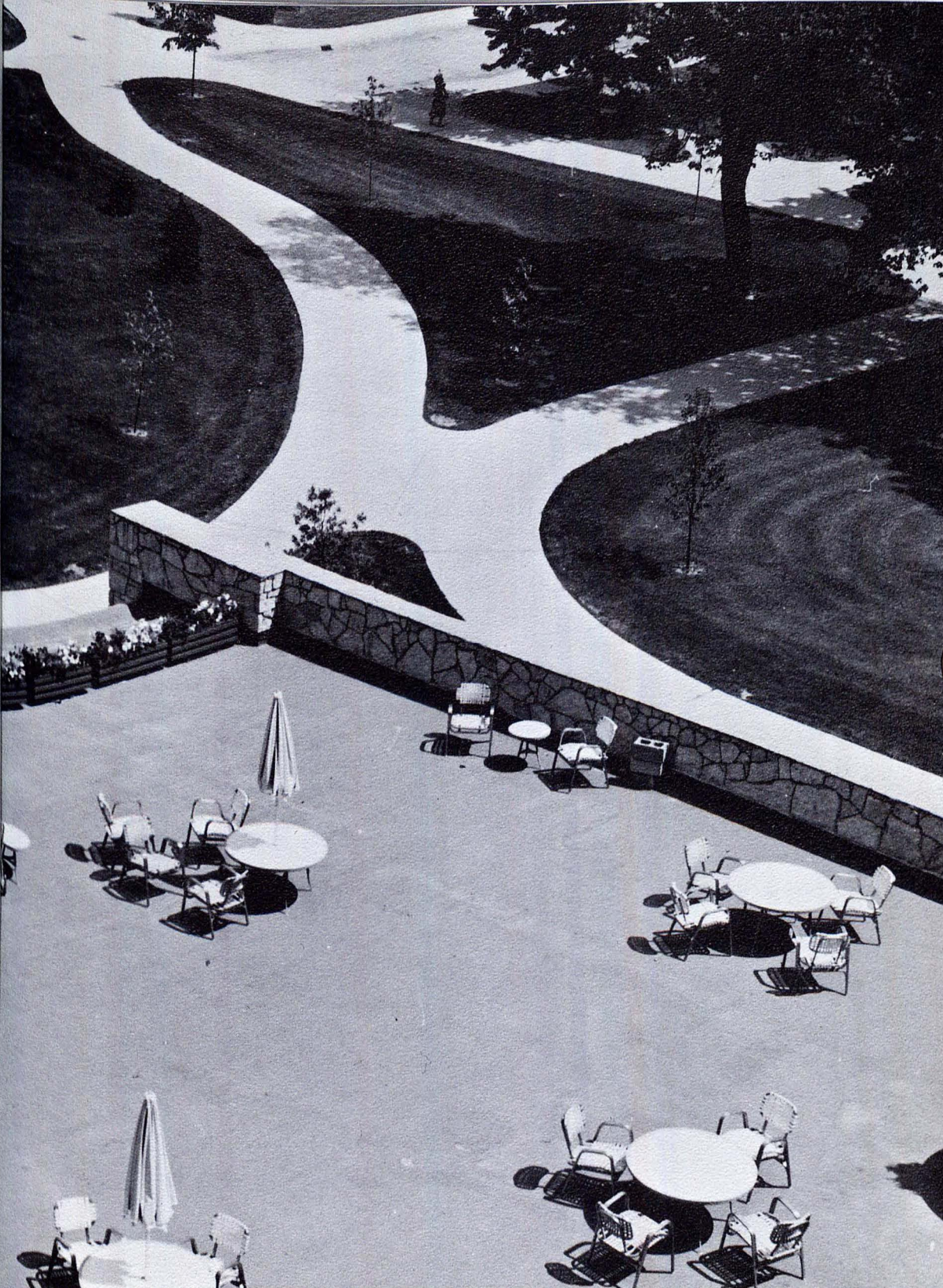
d. Language requirement: At the completion of 9 credit hours of one term of residence the candidate will be required to demonstrate a working knowledge of a modern language. At the completion of 18 credit hours or two terms of residence he must demonstrate a working knowledge of Latin, Greek, or Hebrew if one of these is required for his major area of study.

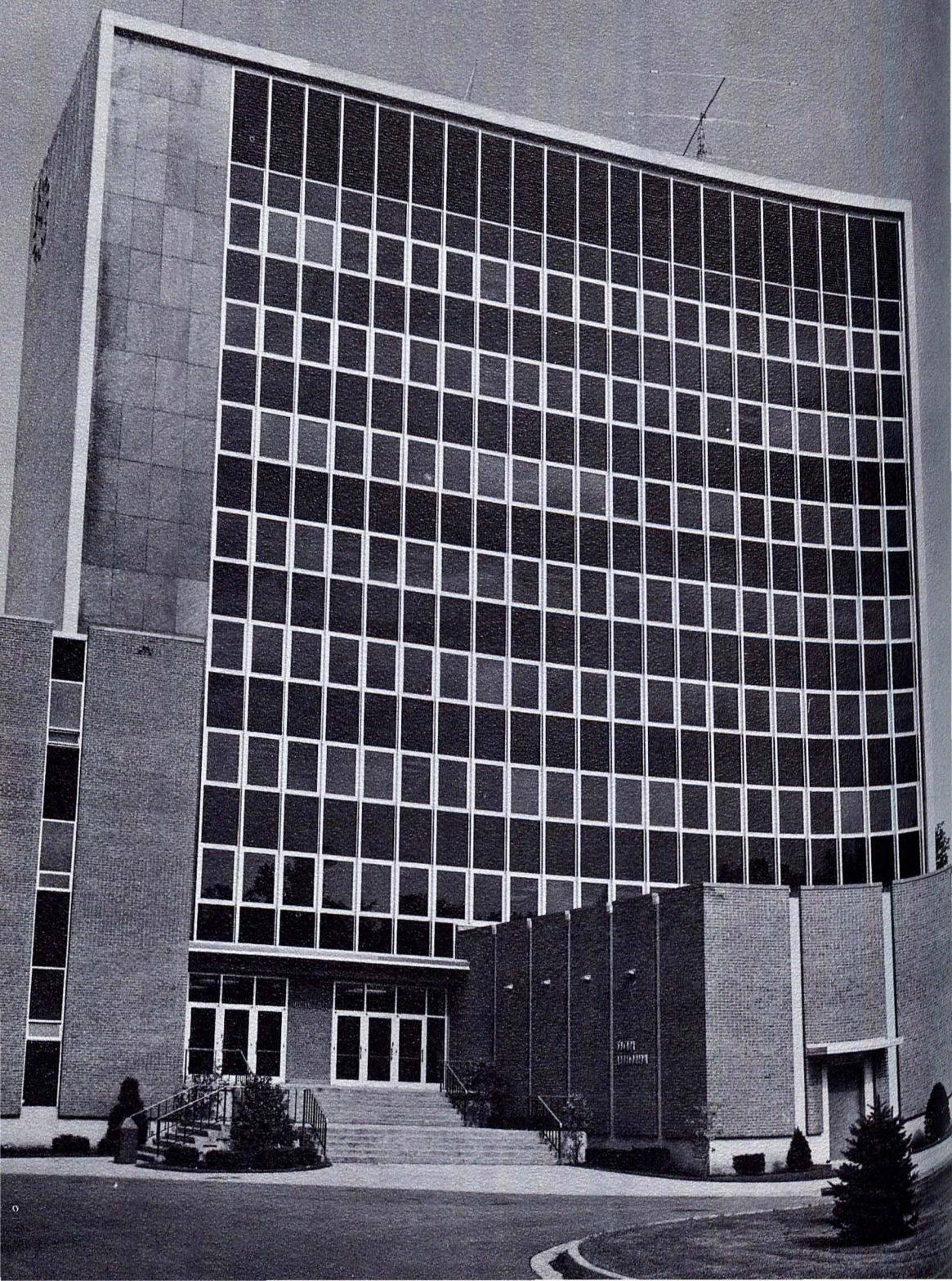
e. Comprehensive examination: At the completion of the program of studies a written and oral comprehensive examination must be taken.

f. Major papers: Each student must write four major papers, usually one each term. Two of these are in his major area; the other two in two other areas.

Program for the M.A. in Theological Studies:

The program leading to a Master's degree in Theological Studies may be pursued in Summer Sessions or full-time, throughout the year. It must be completed within seven calendar years. Other programs in Theological Studies are offered conjointly by the University of Dayton and St. Charles Seminary, and by the University of Dayton and St. Leonard College. Details of these programs, along with the descriptions of the courses offered at St. Charles and at St. Leonard, can be found in the Catalogs of St. Charles Seminary, Carthagen, Ohio, and of St. Leonard College, Centerville, Ohio.





V

School of Business Administration

AIMS AND OBJECTIVES

Graduate Work in Business at the University of Dayton

In the fall term of 1963, the Master of Business Administration program at the University of Dayton was launched. The decision to embark upon graduate education in business resulted from several years of careful study and planning. It was determined that such an undertaking afforded the University an opportunity to meet a growing need in an area in which it was in a position to offer a program consistent with the University's objectives of purpose and quality.

Philosophy of the Master of Business Administration Program

The M.B.A. program is designed to provide advanced work on a professional level for those whose occupational and personal objectives can be thus served. The University recognizes that a society characterized by heavy industrialization and organized activity requires an increasing input of skilled managers and administrators. It also recognizes that the increased complexities of enterprise and organization places demands upon managers and administrators that require more exacting mastery of the business disciplines.

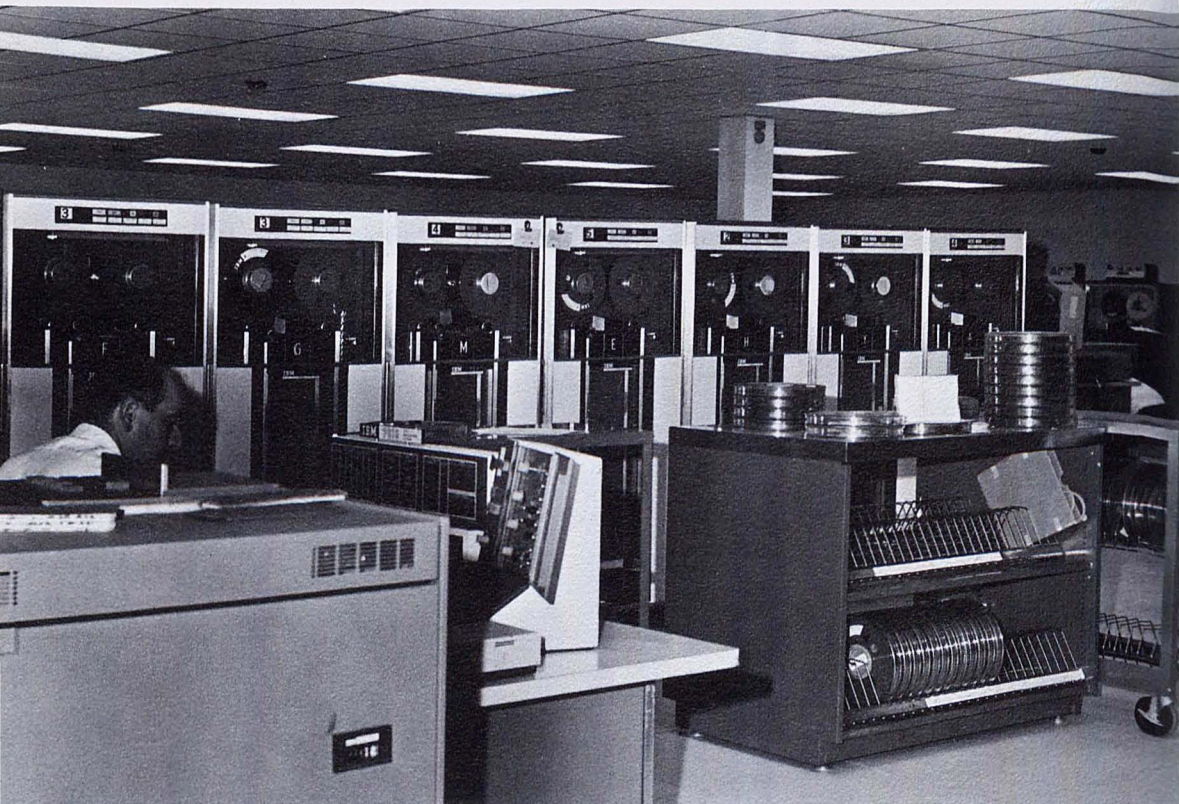
The manager today must view his function as a professional activity. One aspect of professional competence is the mastery of a body of knowledge. Another is the development of proficiency in applying such knowledge in the decision-making situation. The manager's knowledge must encompass certain basic categories: The social, economic and political environment of business enterprise; the basic business functions such as marketing, finance, operations, and accounting; the management process; and the methodologies for research and problem-solving.

The emphasis of the M.B.A. program is on management practice and decision-making. Although some degree of specialization is afforded, most of the student's work is in courses designed to provide a solid grounding in all the basic business functions, the management process, and the economic and social environment. In

the final analysis, most truly managerial decisions require this broad-based educational background.

In summary, then, the objective of the program is to enable the student to achieve the following:

1. An understanding of the factors and forces in the social, economic and political environment that bear directly and indirectly on managerial decision-making.
2. A knowledge of the principles, methods, and applications of the basic business functions of marketing, finance, accounting and operations.
3. An understanding of managerial processes, administrative practices and organizational relationships.
4. Methodologies for problem analysis and decision-making.





ADMISSION

The program is designed for holders of a bachelor's degree from an accredited college in: (1) business administration or (2) a field other than business administration.

Those in the first group usually can meet the requirements for the M.B.A. degree by completing thirty credits of graduate work.

Those in the second group may find it necessary to remove certain undergraduate deficiencies by taking basic courses in accounting, economics, management, statistics, and marketing before starting the program.

Applicants for admission to the M.B.A. program should demonstrate a readiness for graduate study, personal integrity, and aptitude for successful business performance. The admissions committee carefully evaluates the following:

1. Undergraduate and other collegiate record as indicated by official transcripts of all universities and colleges previously attended by the applicants.
2. Results of the Admission Test for Graduate Study in Business (ATGSB).
3. Personal interview may be suggested where questions arise regarding either of the above requirements.



The admissions committee is not only interested in the overall undergraduate grade average but the trend of these grades.

All applicants are required to take the Admission Test for Graduate Study in Business (ATGSB). This should be done prior to the beginning of course work in the program. To register for the examination, request an application form from the School of Business Administration and forward the completed form to the Educational Testing Service, Princeton, New Jersey, thirty days before the examination is to be held.

Two copies of the application for admission to the M.B.A. program are required.

If a personal interview is desired, this may be arranged by contacting the Director of the program, after you have been accepted into the program.

Applicants who are not graduates of the University of Dayton must submit official transcripts of all previous college studies. These transcripts should be sent directly by the degree granting institution at least twenty days before the opening of the session in which the student expects to enroll. All applications and transcripts should be sent to the Dean, School of Business Administration, University of Dayton, Dayton 9, Ohio.

Admission with Advanced Standing

A maximum of six hours of appropriate graduate courses earned at another approved graduate school of business may be applied toward the M.B.A. degree at the University of Dayton. No graduate credit earned at either the University of Dayton or another school may be applied to the M.B.A. degree if such course work was completed more than five years prior to the date of graduation.

Prerequisite Courses

Certain undergraduate courses in business and economics are required before a student is permitted to begin courses at the graduate level. These are in the areas of Economics, Accounting, Principles of Marketing, Principles of Management, and Statistics. If a student is deficient in one or more of these courses, he may remove such deficiency by successful completion of the appropriate course or courses as follows:

- Eco 202 Principles of Economics (MBA section)
- Acc 203 Survey of Accounting (MBA section)
- Mkt 305 Principles of Marketing (MBA section)
- Bus 215 Principles of Management (MBA section)
- Bus 313 Statistics (MBA section)

Each of the above courses is especially designed for students in the M.B.A. program who lack such courses in their undergraduate work. If the student or a prospective student contemplates taking prerequisites at a school other than the University of Dayton, he should consult with the Director in advance to assure that such courses are acceptable as prerequisites.

REQUIREMENTS

Thirty hours of graduate level course work are required for the M.B.A. degree.

Twenty-four of the thirty hours are prescribed as follows:

MBA 570 (Business and Society) and MBA 599 (Business Policies and Administrative Management) *ARE REQUIRED*. MBA 570 may be taken at any time, provided no prerequisites remain to be taken. MBA 599 may be taken *only* after twenty-one hours of graduate courses have been completed.

Six of seven courses designated CORE COURSES must be taken.

The seven core courses are:

- MBA 501 Managerial Accounting
- MBA 510 Business Investigation and Analysis
- MBA 520 Financial Policies of Enterprise
- MBA 530 Marketing Management
- MBA 540 Managerial Economics
- MBA 550 Government and Business
- MBA 560 Operations Management

The six remaining hours may be elected from among the remaining M.B.A. courses listed in the catalogue. With the approval of the Director, certain designated advanced undergraduate courses offered by the School of Business Administration may also be taken as electives. Likewise with the approval of the Director, graduate level courses offered by other schools and departments of the University may be taken as electives. It is emphasized that prior approval of the Director is required before the student may enroll in the latter two categories of courses for graduate credit.

All course work must be completed within five calendar years.

Comprehensive Examination

Successful completion of a comprehensive examination is required for graduation. The examination is given once during each of the three regular terms and may be taken in the student's last term of course work, or after he has completed his course work. The student must receive a passing grade in all of the areas covered by the examination, which are Economics, Accounting, Finance, Marketing, Management, and Business and Society. In each area, the scope of the examination generally corresponds with the content of the required and core courses.

To be eligible to take the Comprehensive Examination, the student must have at least a 3.00 grade average for all graduate courses completed up to the term in which the examination is given. Unless special permission has been granted, the student must have completed twenty-seven (27) graduate hours of work by the end of the term preceding the term in which he is taking the examination.

Academic Standards

Academic standing is determined on a point system in which corresponding letter and quality points are as follows:

A	4.00
B	3.00
C	2.00
F	0.00

A 3.00 or B average is required for graduation. As indicated earlier, a 3.00 average for course work completed is required for eligibility to take the comprehensive examination. To maintain good academic standing, the student must not have received more than six hours of C. He must achieve a 3.00 cumulative average for the first 15 credit hours in order to be permitted to continue in the program. A student whose average is not above 3.00 after nine hours of graduate credit is strongly urged *and may be required* to limit his load to below the maximum permitted according to his work status as indicated below.

Course Load

Graduate work may be pursued on a part-time basis. If the student is employed in a full-time position, he is permitted to carry a maximum of six hours. If the student is employed in a part-time position, he may carry a maximum load of nine hours.

Schedule of Courses

Most courses are scheduled for evening and Saturday morning class periods. The courses are scheduled in such a manner as to permit a student to complete his entire program by attending week night classes exclusively or Saturday morning classes exclusively. Courses are scheduled for all three terms. With the exception of the split Third Term, all required and core courses are normally offered each term. While certain required and core courses may not be offered in the Third Term, most of them are and a maximum load for either part-time or full-time students is available for either or both of the two half-term periods.



VI School of Education

AIMS AND OBJECTIVES

The general objective of the School of Education coincides with the purpose of the University of Dayton: "To provide an academic atmosphere in which Christian principles of thought and action are the essential integrating and dynamic forces impelling the student to pursue, to cherish, and to disseminate what is true, good, and beautiful."

The particular objective of the School of Education is to develop those special capabilities of the student which enable him to become an effective practitioner in the field of professional education.

The programs leading to the Master of Science in Education degree are designed primarily to meet the following three purposes:

1. Develop Master Teachers on the elementary and secondary school levels.
2. Enable certified teachers to work toward certification as school counselors, school psychologists, or educational research specialists.
3. Enable teachers with at least three years' successful teaching experience to qualify for certification as principal, or as supervisor, or as executive head.

Development of Master Teachers

In undertaking the task of developing master teachers, the School endeavors to provide a continuation on the graduate level of a recognized baccalaureate teacher education program. It addresses itself to the needs of graduates who carry initial certification as teachers. Hence, the program represents an additional year beyond the professional baccalaureate degree involving work at a more advanced level than that which characterizes undergraduate study.

a. Master High School Teachers: To develop master teachers on the secondary school level, a program is provided to enable the teacher to advance himself primarily in the SUBJECT-MATTER of his teaching field.

b. Master Elementary School Teachers: To develop master teachers on the elementary school level, a program is planned to fit the special needs of each

teacher, involving provision on the graduate level for greater depth in general education, or greater mastery of an academic subject field, or greater proficiency in professional practice, or a combination of two or all three of the above. Considerable attention is directed to those objectives which are established through a clear conception of what the competencies and qualities of a skilled teacher should be.

Preparation of School Counselors:

This program is designed to prepare school personnel for specialized services in the area of school guidance and counseling. This preparation calls for the development of competencies that enable the counselor to perform such duties as:

- a. Counseling pupils on their curricular programs, extra-curricular activities, in their personal-social adjustment, in occupational adjustment, in placement problems, and in other related matters.
- b. Working with teachers in studying, diagnosing, and understanding students; planning and conducting group guidance activities; utilizing community resources; and participating in in-service teacher-education activities.
- c. Working with the administrative staff and other school personnel in planning, developing, and conducting the total guidance program, curriculum, study, and research.
- d. Working with lay groups, parents, and individuals in coordinating school and community resources and activities which contribute to improve pupil personnel services.

Preparation of School Psychologists:

This program requires an intensive psychological study of children and adolescents designed to prepare specialists who can serve both the school and the community:

- a. As experts in educational and personality diagnosis and remediation.
- b. As consultants in problems relating to curriculum and instruction, group testing, counseling and guidance, pupil personnel policies, special education—particularly as these problems affect the adjustment of children and adolescents to school situations.
- c. As resource persons in such areas as child development, mental health, and psychological therapy.

Preparation of School Administrators:

This program endeavors to develop in the candidate such attributes as the following:

- a. Knowledge of the purposes of the work to be administered and a sincere loyalty to those purposes.

b. Appreciation and use of the strategic institutional structure to carry out the purposes.

c. Knowledge of the large principles of administration (the science of administration) to apply them particularly in elementary and secondary school administration.

d. Knowledge and practice of the principles of effective supervision.

e. Understanding of the processes of evaluation of the whole school program in the light of the school's philosophy and objectives, plus the ability to apply these processes to curriculum improvement.

f. Ability in social and professional leadership in both school and community which will cause the candidate to be recognized as an organizer and leader.

g. Ability to locate and solve problems within a school or school system on the basis of sound research, understandings, and practices.

h. Functional knowledge of the ethics of the teaching profession.

i. Functional knowledge of the principles and procedures of guidance.

Preparation of Educational Research Specialists:

This program is designed to prepare individuals to perform the varied research and evaluative functions which are becoming increasingly vital for school systems. This preparation stresses the development of the following competencies:

a. Developing and testing creative hypotheses congruent with the functioning of a particular school or school system.

b. Working with administrators, teachers, and those in pupil personnel toward the end of researching the effectiveness of regular practices as well as innovative programs.

c. Assisting administrators in the task of efficient data collection and scheduling, utilizing the latest scientific instruments.

d. Becoming able to assume the unique dual role of administrator and researcher by earning the administrative specialist in research certificate.

e. Perceiving clearly, actively, and practically the relationships between research and the following: curriculum development, teaching and learning strategies, guidance services, and effective administrative and institutional structures.

Preparation of Certified High School Teachers:

This program is restricted to students who (1) hold a non-professional bachelor's degree; (2) have earned the degree within a period of ten years prior to application to the program; (3) have an undergraduate cumulative point average of 3.0 or higher (on a 4.0 scale); (4) desire certification to teach in secondary school; (5) have a major teaching field which can be serviced by graduate courses offered at the University of Dayton. (Students who desire high school certification but

cannot meet these requirements may take Program E-9 on the undergraduate level. Cf. Undergraduate Catalog.)

The program described here, leading to the Master's degree, involves professional education courses on the graduate level, graduate courses in the student's major (principal teaching field), and a teaching internship.

THE MASTER'S PROGRAM IN EDUCATION

Title and Meaning of the Degree:

The title of the Master's degree to which all the indicated programs lead is the Master of Science in Education.

The awarding of this degree means that the candidate has completed a program of graduate work designed to give him the following characteristics:

- a. Broader knowledge of an advanced nature of the tested psychological and philosophical theories of education.
- b. Essential understandings and skills necessary for intelligent consumption of educational research.
- c. More extensive knowledge and skill involved in teaching, or in school counseling, or in school administration.
- d. Ability to contribute toward the improvement of school conditions and/or professional practice through consumer research.

Authorization:

The University of Dayton's offerings in graduate work leading to the Master of Science in Education degree have the official approval of the State of Ohio, Department of Education, of the North Central Association of Colleges and Secondary Schools, and of the National Council for the Accreditation of Teacher Education.

The programs in School Counseling, in School Psychology, and in School Administration lead to Provisional Certification by the State of Ohio.

The Master Teacher program may lead to Eight Year Professional or to Permanent Certification depending on the years of successful teaching performed under the previous provisional certificate held.

Admission Requirements:

The School of Education accepts those students into its graduate program who can present undergraduate records which show them capable of meeting the standards of graduate work and of becoming leaders in their respective fields of professional education.

In order to qualify for registration in any graduate course, both special students and regular students must hold a teacher's certificate on a bachelor's degree from an accredited institution (at least State Accreditation) and must have attained an undergraduate quality-point average of at least 2.50 out of a possible 4.00. An exception to the latter requirement may be made if the applicant has a cumulative point average of 3.0 or higher for his junior and senior years.

An applicant who is not a graduate of the University of Dayton must submit complete official transcripts of all of his previous college studies. These transcripts should be sent directly to the Office for Graduate Studies from the degree-granting institution at least twenty days before the opening of the term or summer session in which the student expects to enroll.

Admission to graduate study as a special student or as a regular student does not imply admission to candidacy for a degree.

Besides meeting the above requirements, an applicant for the School Psychologist Program must receive a favorable recommendation from the School Counseling staff. In deciding whether or not to make such a recommendation to the Admissions Committee, the staff will take into account the applicant's physical and mental health, his personality adjustment as determined by appropriate tests, and his general character as determined by reference appraisals solicited from former professors and employers.

Entrance Examination:

Either the Graduate Record Examination (GRE) or the National Teacher Examination (NTE) is required of all graduate students, and the results must be on file with the Graduate Committee, School of Education, prior to application for degree candidacy.

The GRE is given four times annually at a number of universities, including the University of Dayton. Arrangements should be made through the Educational Testing Service, Box 911, Princeton, New Jersey 08440. Both the Aptitude Test and one Advanced Test should be taken.

The NTE is also given four times a year on the dates listed in the calendar of this Bulletin. The Common Examinations and one Teaching Area Examination should be taken. Further information may be requested from the Education Office.

Admission to Candidacy for Degree:

A student becomes a candidate for the Master of Science in Education degree if his graduate work to date, the reference appraisals, and the GRE or NTE results are judged to be acceptable by the Graduate Committee. At this time the candidate's Preliminary Plan for his Research Project is approved, and he is assigned an official advisor to direct the Project.

The most important consideration in the admission of a student to candidacy is the qualitative aspect of his graduate work to date. He must give evidence of being able to meet all the graduation requirements. Applicants who are deemed unqualified at this point will be advised to discontinue their program.

Students may apply for admission to candidacy after the completion of twelve semester credit hours of graduate work (including EdF 503 Research Methodology and Statistics) by filing with the Graduate Committee the official application form. They should be sure that all the required credentials are in order and that their Preliminary Plan for the Research Project is ready for evaluation.

Applicants with a concentration in Administration must present evidence of at least three years of successful teaching and a letter of recommendation to the program from an administrator in position to judge their potential for educational leadership.

Students following the School Psychologist Program are admitted to candidacy at the time they are approved for internship. Since no Research Project is included in this program, completion of EdF 503 and submission of the Preliminary Plan are not requirements for candidacy.

Students following Plan C in the School Counseling Program are admitted to candidacy upon completion of 36 semester credit hours or in the term in which the final courses are taken.

Requirements for the Degree:

a. Research Project: At least ten days before graduation the student must submit three acceptable copies of his Research Project and three copies of an abstract of the Project.

b. Required Average: Students must achieve an average of at least 3.00 ("B" average) in all work undertaken in order to qualify for graduation.

c. Comprehensive Examination: The student must pass a final comprehensive examination conducted by his examining board. This examination covers the whole field of the student's graduate studies.

A student who fails his comprehensive examination may be given permission to take a second examination at the discretion of the examining board at least one semester or summer term (but no later than one academic year) after the first examination. No third examination is given.

Advisement:

The Dean of the School of Education acts as general advisor to all graduate students regardless of the program they are following. In this capacity, he will counsel students with a view toward orienting them in the purposes and require-

ments of graduate work and will assist them in planning their programs and schedules.

PROGRAMS OF STUDY

PROGRAM I: MASTER HIGH SCHOOL TEACHER

<i>Core Courses</i>	<i>Nine credit hours</i>
EdF 501 Advanced Psychology of Learning	three credit hours
EdF 502 Comparative Philosophies of Education	three credit hours
EdF 503 Research Methodology and Statistics	three credit hours
<i>Area of Concentration</i>	<i>Twelve credit hours</i>
Content courses in a selected teaching field	
<i>Electives</i>	<i>Six credit hours</i>
Further courses in the selected teaching field or in allied field; or (with the approval of the advisor) courses in general or professional education.	
<i>Graduate Seminar (EdF 592)</i>	<i>Three credit hours</i>

PROGRAM II: MASTER ELEMENTARY TEACHER

<i>Core Courses</i>	<i>Nine credit hours</i>
EdF 501 Advanced Psychology of Learning	three credit hours
EdF 502 Comparative Philosophies of Education	three credit hours
EdF 503 Research Methodology and Statistics	three credit hours
<i>Possible Concentrations</i>	<i>Eighteen credit hours</i>
1. GENERAL ELEMENTARY EDUCATION	
EdE 500 Mathematics in the Elementary School	
EdA 511 Elementary School Curriculum	
EdE 564 Advanced Science in the Elementary School	
EdE 568 Diagnosis and Correction of Reading Difficulties	
*EdE 325 Social Studies in the Elementary School	
*EdE 451 Adv. Kindergarten-Primary Instruction	
— — Electives	
2. SPECIAL EDUCATION	<i>Eighteen credit hours</i>
*EdE 480 Psychology of Slow Learning Children	
*EdE 484 Language Arts for Slow Learning Children	
*EdE 485 Social Studies for Slow Learning Children	
*EdE 486 Arithmetic for Slow Learning Children	
*EdE 487 Occupational Orientation and Job Training	

- *EdE 488 Materials of Instruction for Slow Learning Children
- EdA 511 Elementary School Curriculum
- EdE 547 Psychology of Exceptional Children
- — Elective

3. *READING SPECIALIST*

Eighteen credit hours

- EdA 511 Elementary School Curriculum
- EdE 567 Survey of Research in Reading
- EdE 568 Diagnosis and Correction of Reading Difficulties
- EdE 569 Practicum in Reading
- EdE 570 Supervision and Curriculum in Reading
- — Electives

4. *COOPERATING TEACHER*

Eighteen credit hours

- EdE 500 Mathematics in the Elementary School
- EdE 560 Unit Teaching
- EdE 561 Analysis of Instruction
- EdE 562 New Media and Methods in Elementary Education
- EdE 563 Supervision of Student Teaching
- EdE 568 Diagnosis and Correction of Reading Difficulties
- — Elective

Note: Other possible concentrations to fit the needs of students may be worked out in conference with the Dean.

Graduate Seminar (EdF 592)

Three credit hours

PROGRAM III: SCHOOL COUNSELOR

Three options are available to students following this program:

- Plan A: Requires 30 credit hours, a Research Project, and an oral comprehensive examination.
- Plan B: Requires 30 credit hours, a Study in Guidance and Counseling, and a written comprehensive examination.
- Plan C: Requires 36 credit hours, a Research Paper, and a written comprehensive examination.

As early as possible in their program students should choose a departmental advisor and with him decide upon which Plan they will follow.

Core Courses

Nine credit hours

- EdF 502 Comparative Philosophies of Education three credit hours
- EdF 503 Research Methodology and Statistics three credit hours
- EdF 504 Advanced Child and Adolescent Psychology three credit hours

*Concentration**Twenty-five to Twenty-seven credit hours*

EdC 531	Dynamics of Personality	three credit hours
EdC 522	Principles and Techniques of Guidance, <i>or</i>	three credit hours
EdC 580	Guidance in the Elementary School	three credit hours
EdC 583	Group Guidance	three credit hours
EdC 524	Educational and Occupational Information	two credit hours
EdC 533	Psychometrics	two credit hours
EdC 543	Principles and Techniques of Counseling, <i>or</i>	three credit hours
EdC 581	Counseling in the Elementary School	three credit hours
EdC 545	Practicum in Counseling Techniques	three credit hours
EdF 592	Graduate Seminar (Plan A)	three credit hours
EdF 599	Individual Study in Guidance & Counseling (Plan B)	three credit hours

Electives

EdC 525	Use of Community Resources in Guidance	two credit hours
EdC 530	Psychology of Individual Differences	two credit hours
EdC 535	Practicum in Test Interpretations and Case Studies	two credit hours
EdC 539	Administration of a School Guidance Program	two credit hours
EdF 501	Advanced Psychology of Learning	three credit hours
EdF 593	Interpretation of Statistics	three credit hours
EdS 455	Practicum in High School Reading Improvement	two credit hours
EdE 480	Psychology of Slow Learning Children	two credit hours
EdE 547	Psychology of Exceptional Children	three credit hours
EdE 568	Diagnosis and Correction of Reading Difficulties	three credit hours
Psy 533	Decision Processes	three credit hours
Psy 579	Practicum in Interviewing and Counseling College Students	three credit hours

Students who desire to qualify for a SUPERVISOR'S CERTIFICATE IN SCHOOL COUNSELING should add to the above program the following courses:

EdA 509	School Supervision	three credit hours
EdA 511	Elementary School Curriculum	two credit hours
EdA 512	Secondary School Curriculum	two credit hours
EdA 515	School Law, <i>or</i>	two credit hours
EdA 521	School Public Relations	two credit hours
EdF 518	School and the Social Order	three credit hours
EdC 530	Psychology of Individual Differences, <i>or</i>	two credit hours
EdE 547	Psychology of Exceptional Children	three credit hours
EdF 593	Interpretation of Statistics	two credit hours

PROGRAM IV: SCHOOL PSYCHOLOGIST*Core Courses*

EdF 501	Advanced Psychology of Learning	<i>Nine credit hours</i> three credit hours
EdF 502	Comparative Philosophies of Education	three credit hours
EdF 504	Advanced Child and Adolescent Psychology	three credit hours

*Concentration**Twenty-five credit hours*

EdC 531	Dynamics of Personality	three credit hours
EdE 547	Psychology of Exceptional Children	three credit hours
EdC 533	Psychometrics	two credit hours
EdC 543	Principles and Techniques of Counseling	two credit hours
EdE 568	Diagnosis and Correction of Reading Difficulties	three credit hours
EdC 572	The School Psychologist: Role and Function	two credit hours
EdF 593	Interpretation of Statistics, <i>or</i>	two credit hours
Psy 501	Advanced Statistics	three credit hours
EdC 576	Child & Adolescent Personality Evaluation I	four credit hours
EdC 577	Child & Adolescent Personality Evaluation II	four credit hours

*Internship (EdC 594-595)**Twelve credit hours***PROGRAM V: SCHOOL ADMINISTRATOR***Core Courses**Nine credit hours*

EdF 502	Comparative Philosophies of Education	three credit hours
EdF 503	Research Methodology and Statistics	three credit hours
EdF 504	Advanced Child and Adolescent Psychology, <i>or</i>	three credit hours
EdF 501	Advanced Psychology of Learning	three credit hours

*Concentration**Thirteen credit hours*

Students interested in *Elementary School Administration* should take the following courses:

EdA 506	School Administration	three credit hours
EdA 509	School Supervision	three credit hours
EdA 511	Elementary School Curriculum	two credit hours
EdA 513	Elementary School Evaluation	two credit hours
EdC 522	Principles and Techniques of Guidance	three credit hours

Students interested in *Secondary School Administration* should take the following courses:

EdA 506	School Administration	three credit hours
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EdA 509	School Supervision	three credit hours
EdA 512	Secondary School Curriculum	two credit hours
EdA 514	Secondary School Evaluation	two credit hours
EdC 522	Principles and Techniques of Guidance	three credit hours

Electives *Five credit hours*

EdA 515	School Law	two credit hours
EdA 516	School Plant	two credit hours
EdA 517	School Finance	two credit hours
EdF 518	School and the Social Order	three credit hours
EdA 521	School Public Relations	two credit hours
EdC 522	Principles and Techniques of Guidance	three credit hours
EdC 530	Psychology of Individual Differences	two credit hours
EdC 533	Psychometrics	two credit hours
EdC 539	Administration of a School Guidance Program	two credit hours
EdC 543	Principles and Techniques of Counseling	three credit hours
EdE 547	Psychology of Exceptional Children	three credit hours

Graduate Seminar (EdF 592) Three credit hours

(Note: Programs can be arranged for students who desire to work for higher administrative and supervisory certificates.)

PROGRAM VI: EDUCATIONAL RESEARCH SPECIALIST

Core Courses *Six credit hours*

EdF 501	Advanced Psychology of Learning	three credit hours
EdF 502	Comparative Philosophies of Education	three credit hours

Concentration *Thirteen credit hours*

EdA 514	School Evaluation	two credit hours
EdC 533	Psychometrics	two credit hours
EdF 593	Interpretation of Statistics	three credit hours
	Data Processing and Computer Techniques	three credit hours
EdF 590	Educational Research Design	three credit hours

Internship in Educational Research (EdF 596-597) *Twelve credit hours*

PROGRAM VII: TEACHER CERTIFICATION

Core Courses *Nine credit hours*

EdF 501	Advanced Psychology of Learning	three credit hours
EdF 502	Comparative Philosophies of Education	three credit hours
EdF 518	School and the Social Order	three credit hours

Concentration

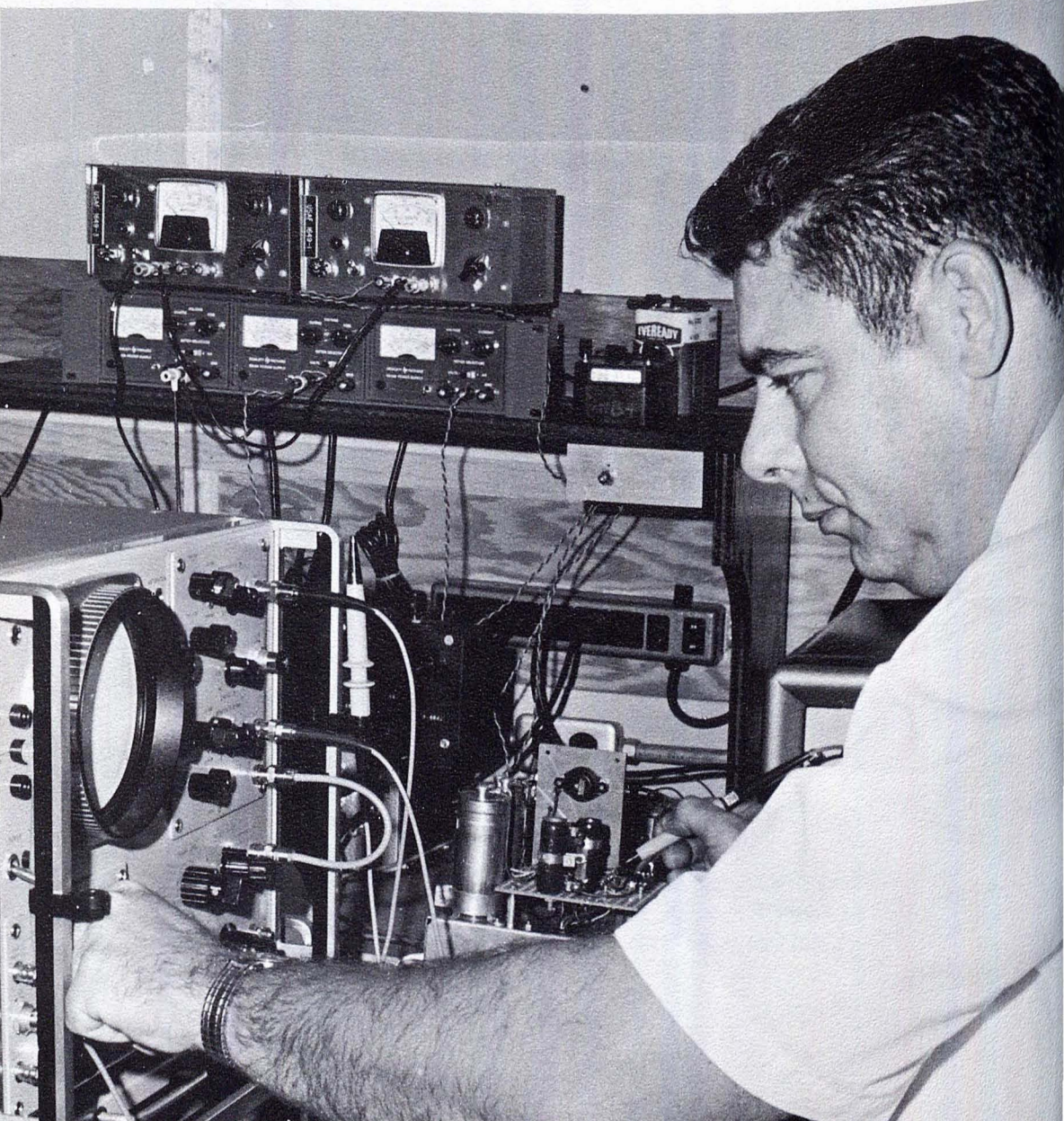
EdS 351 The Secondary School: Purposes and Practices
Special Methods in Principal Teaching Field
Content Courses in Principal Teaching Field

Internship in Teaching (EdS 598)

Nineteen credit hours

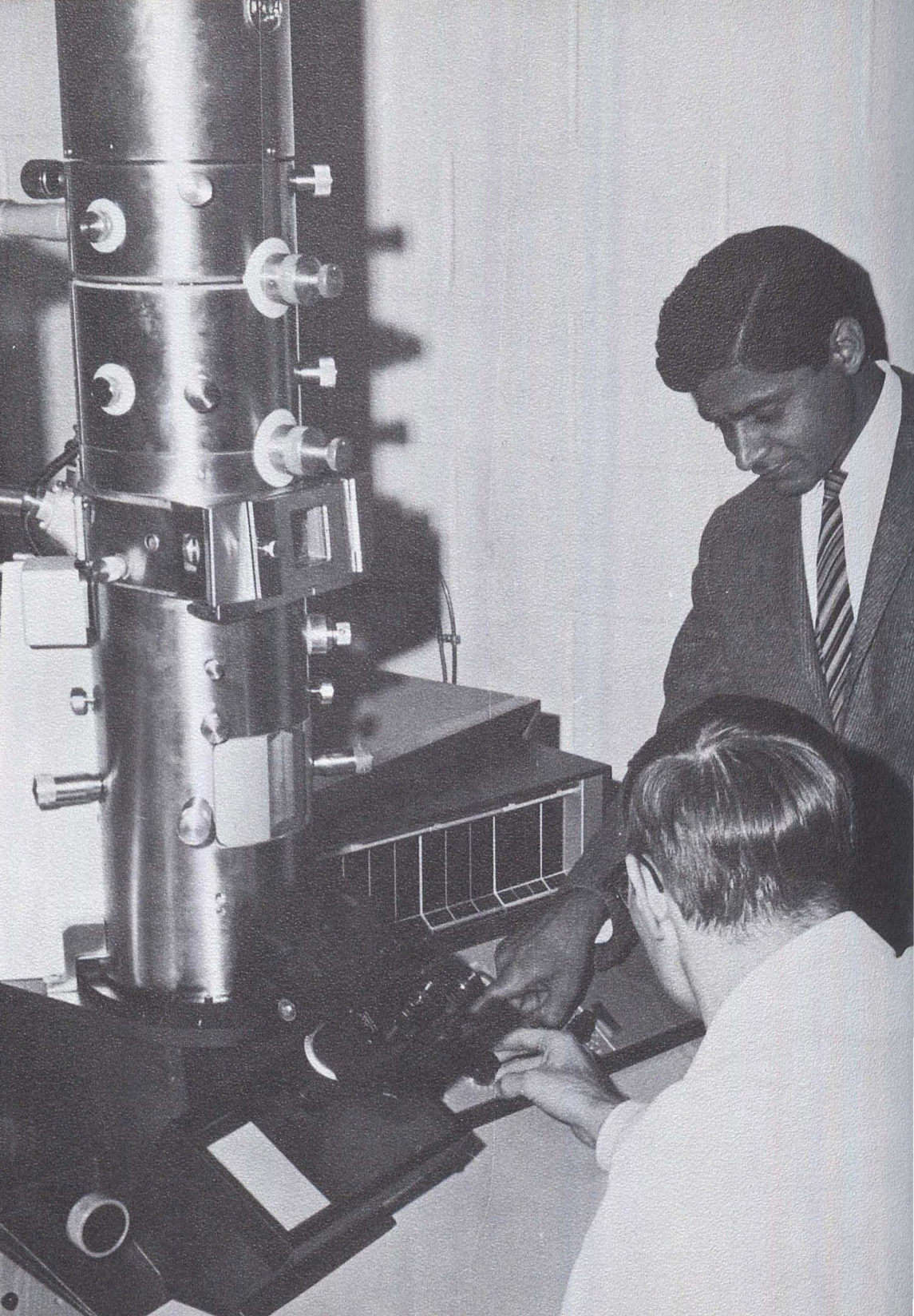
two credit hours
two credit hours
fifteen credit hours

Eight credit hours



JOHN F. KENNEDY
MEMORIAL UNION





VII School of Engineering

FOREWORD

The general objective of the School of Engineering is identical with the purpose of the University of Dayton in meeting its objective of serving the community and fulfilling its motto, *Pro Deo et Patria*. The specific purpose of the graduate program in engineering is to provide the best possible education for men and women at the graduate level for enriched careers in engineering. This purpose is achieved by developing those special capacities and capabilities of the student which enable him to become a thoroughly competent professional in his chosen field.

The programs leading to the several Master's degrees in the Engineering areas, are designed to meet the professional needs of the engineer. They are also a preparatory step toward a Ph.D. degree.

TYPES OF ADMISSION

A. REGULAR—Regular admission is granted to applicants who satisfy the requirements for admission to a degree program of the Graduate School of Engineering. Applicants in this category must be holders of a bachelor's degree from an institution having curricula accredited by the Engineer's Council for Professional Development and must have demonstrated superior academic performance in their respective major fields.

B. CONDITIONAL—Conditional admission is granted to applicants who do not qualify for regular admission but show promise of being able to complete the requirements for the graduate degree. Conditional admission may be granted to qualified applicants:

1. Holding a bachelor's degree in engineering from an institution not having curricula accredited by ECPD.

2. Holding a bachelor's degree from a college or university, located in a foreign country; whose native language is not English and whose preparation cannot be adequately determined.
3. Holding a bachelor's degree in mathematics or the physical sciences, whose academic performance indicates an ability to do satisfactory graduate work.
4. Whose preparation cannot be determined adequately and for whom any part of their qualifying education was obtained more than seven years before the proposed date of initiation of studies in the graduate program.
5. In their final term of work toward their bachelor's degree pending the filing of supplementary transcripts and evidence of the awarding of the degree.
6. Who are undergraduates at the University of Dayton and who are within six credit hours of graduation. Their admission to the graduate program will be for a single term during which the undergraduate work must be completed and the bachelor's degree obtained. The combined elections in both the undergraduate and graduate programs for one term may not exceed 12 hours and only students who have excellent records should seek admission to the graduate program.

Applicants in categories 1 to 4 inclusive may be required to complete additional qualifying work beyond the normal degree requirements. Applicants in these categories will be permitted to complete 12 credit hours of graduate work at the end of which a cumulative graduate grade point average of B or 3.00 must have been maintained. Otherwise, dismissal from the graduate program may result. Applicants in categories 5 and 6 will be subject to re-evaluation and reclassification upon completion of the indicated program.

C. SPECIAL—See General Academic Information regarding Special Status.

THE MASTER'S PROGRAM

The Director of Engineering Graduate Programs will assign each student admitted to graduate study to the Chairman of the Department of the student's major interest. After consultation with the student, the Chairman will arrange for a member of the Department to be the student's permanent advisor. The advisor will guide the student in the development of a Program of Studies deemed best for his particular interests and objectives. The Program of Studies approved by the advisor and the Chairman of the Department will be filed with and

approved by the Director of Engineering Graduate Programs. A graduate student may not change from one advisor to another without written permission from the Director.

It is the student's responsibility to meet with the Chairman of the Department and the advisor as soon as possible after being formally accepted by the Office for Graduate Studies. Conditional attendance for one term is permitted until the Program of Studies has been filed. Amendment to the original program is permitted with the approval of the advisor and the Department Chairman and must be filed with the Director of Engineering Graduate Programs.

All programs and amendments must be prepared in quintuplicate. One copy will be retained by the student, department chairman, advisor, Director's office, and the Office of Graduate Studies.

GENERAL DEGREE REQUIREMENTS

A student admitted for a master's program in engineering must have met the requirements for the bachelor's degree in his field of engineering.

He must successfully complete the minimum number of hours of graduate work which are approved by his advisor and which are required in the program for which he is registered. He must obtain a cumulative average of B, 3.00, or better. At the discretion of the advisor an oral or written examination may be required to confirm the student's ability to complete the program satisfactorily.

Satisfactory completion of a thesis or an engineering project represents an important part of the degree requirements and the indicated credit becomes a part of the cumulative average.

THESIS EXAMINATION

A satisfactory final oral thesis examination is a requirement for the completion of certain programs. Where specified such examination will be conducted by the departmental advisory committee under the supervision of the advisor as chairman. An application form for the examination should be obtained from the Office of the Director of Engineering Graduate Programs, filled out, signed by the advisor, and filed with the Office of the Director at least two weeks prior to the date of the oral examination. The final oral thesis examination record, showing satisfactory completion, shall be filed with the Office of the Director at least 10 days prior to the date of graduation.

THESIS

Joint authorship is not permissible. Students following a program which requires a thesis examination, must have copies of completed theses in the hands of the advisory committee for approval two weeks prior to the date for the final oral

thesis examination. After the final oral examination, three completed and approved typewritten copies shall be deposited with the library. These copies must be deposited at least one week prior to commencement. The University of Dayton Thesis Manual, prepared by the Engineering Graduate School, shall be used as a guide in preparing the thesis. If thesis research is conducted at the candidate's place of employment, confidential aspects of research projects will be observed. When requested, arrangements will be made to delay public disclosure of the thesis or its subject matter for any reasonable time to permit filing of patents or taking any other measure to protect the rights of the employer to the findings of the research program.

THE MASTER OF SCIENCE IN ENGINEERING PROGRAM

The Program of Study must include a minimum of 30 credit hours consisting of the following:

1. 6 credit hours in Basic Sciences;
2. 12 credit hours in Engineering Sciences;
3. 3 credit hours in Philosophy;
4. 3 credit hours in Thesis Supporting Courses approved by the student's advisor;
5. 6 credit hours on an approved thesis project.*

Courses:

1. Basic Sciences
6 credit hours are to be selected from the general basic science group taught by the Mathematics and Science Departments.
2. Engineering Sciences
12 credit hours of engineering subjects approved by student's advisory committee.
3. Philosophy
Egr. 522** Philosophical Foundations of Engineering three credit hours

*Students who have completed registration in all courses including thesis, but have not completed the thesis, must request approval for continuance in the graduate program by means of a Graduate Student Approval form each term until graduation. A regular grade will be assigned upon satisfactory completion of the thesis and will be included in the final cumulative grade point average. Prior to completion, cumulative averages will be calculated only on the basis of course performance, and a grade of "P" will be given for the thesis.

**Suitable graduate philosophy courses may be substituted.

4. Thesis Supporting course
A 3 credit hour course approved by the student's advisory committee.
5. Thesis
6 credit hours on an approved investigational project.

Examinations:

A final examination at the completion of the thesis is required.

THE MASTER OF SCIENCE IN CIVIL ENGINEERING PROGRAM

The Program of Study must include a minimum of 30 credit hours consisting of the following:

1. 3-6 credit hours in Basic Sciences;
2. 18-21 credit hours in Civil Engineering, Engineering Science, or thesis related subjects;
3. 6 credit hours on an approved thesis project*.

*See first footnote on page 70, under Master of Science in Engineering Program.

Courses:

1. Basic Sciences
3-6 credit hours are to be selected from the general basic science group taught by the Mathematics and Science Departments.
2. Civil Engineering, Engineering Science, or Thesis Supporting Courses
18-21 hours to be selected from the following courses:

Civil Engineering

Cie 500	Advanced Structural Analysis	three credit hours
Cie 502	Prestressed Concrete	three credit hours
Cie 520	Advanced Soil Mechanics	three credit hours
Cie 524	Foundation Design	three credit hours
Cie 540	Highway Geometric Design	three credit hours
Cie 544	Traffic Engineering	three credit hours
Cie 558	Traffic Engineering Research	three credit hours
Cie 560	Advanced Sanitary Engineering	three credit hours
Cie 562	Industrial Waste Treatment	three credit hours
Cie 580	Hydrology and Seepage	three credit hours
Cie 582	Advanced Hydraulics	three credit hours
Cie 598	Special Problems in Civil Engr.	two to six credit hours

Engineering Sciences

Egr 501	Applied Elasticity	three credit hours
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Egr 502	Mechanics of Fluids	three credit hours
Egr 503	Thermodynamics	three credit hours
Egr 504	Mass and Energy Transport	three credit hours
Egr 505	Properties of Materials	three credit hours
Egr 506	Solid State Devices	three credit hours

Thesis Supporting Courses

Thesis Supporting Courses approved by the student's advisor.

3. Thesis

Cie 599 6 credit hours on an approved thesis project.

Examinations:

A final examination at the completion of the thesis is required.

THE MASTER OF SCIENCE IN ELECTRICAL ENGINEERING PROGRAM

The program of study must include a minimum of 30 credits hours consisting of the following:

1. 6 credit hours in Basic and Engineering Sciences;
2. 12 credit hours in Electrical Engineering;
3. 6 credit hours in Thesis Supporting Courses approved by the student's advisor;
4. 6 credit hours on an approved thesis project.*

*See first footnote on page 70, under Master of Science in Engineering Program.

Courses:

1. Basic and Engineering Sciences
6 credit hours are to be selected from either the general basic science group taught by the Mathematics and Science Departments, or from the Engineering Sciences group listed in the Master of Science in Engineering Program. It is permissible to combine three credit hours from each program. Selected courses must meet with the approval of advisor.
2. Electrical Engineering
12 credit hours to be selected from the following courses:

Ele 501	Analog and Digital Computers	three credit hours
Ele 502	Adv. Circuit Analysis	three credit hours
Ele 505	Quantum Electronics	three credit hours
Ele 507	Electromagnetic Fields I	three credit hours

Ele 508	Electromagnetic Fields II	three credit hours
Ele 509	Analysis of Linear Systems	three credit hours
Ele 513	Communication Theory	three credit hours
Ele 514	Analysis of Non-Linear Systems	three credit hours
Ele 515	Automatic Control Theory	three credit hours
Ele 516	Gaseous Electronics and Plasmas	three credit hours
Ele 520	Magnetic Materials & Superconductors	three credit hours
Ele 521	Conductors and Dielectrics	three credit hours
Ele 522	Magnetic Measurements	three credit hours
Ele 523	Permanent Magnets	three credit hours
Ele 598	Special Problems	three credit hours

3. Thesis Supporting Courses

6 credit hours in Thesis Supporting Courses approved by the student's advisor.

4. Thesis

Ele 599 6 credit hours on an approved Thesis Project.

The Thesis may be replaced by two additional courses (6 credit hours) when a candidate can provide evidence of previous experience in engineering research. Permission to substitute courses must be obtained by the student's Advisory Committee.

Examinations:

A final examination at the completion of the thesis is required.

THE MASTER OF MECHANICAL ENGINEERING PROGRAM

The Program of Study leading to the degree of Master of Mechanical Engineering with major areas of study in Thermal Engineering, Fluid Mechanics and Mechanical Design must include a minimum of 30 credit hours consisting of the following:

1. 15 credit hours in Mechanical Engineering;
2. 6 credit hours in Mechanical Engineering Project;
3. 9 credit hours of electives.

Courses:

1. Mechanical Engineering

15 credit hours to be selected from the following courses:

Material Science

Mee 501	Physical Metallurgy I	three credit hours
Mee 502	Physical Metallurgy II	three credit hours

Thermal Engineering

Mee 511	Classical Thermodynamics	three credit hours
Mee 512	Conduction Heat Transfer	three credit hours
Mee 513	Jet Propulsion	three credit hours
Mee 514	Direct Energy Conversion	three credit hours
Mee 515	Statistical Thermodynamics	three credit hours
Mee 516	Convection Heat and Mass Transfer	three credit hours
Mee 517	Radiation Heat Transfer	three credit hours

Fluid Mechanics

Mee 521	Viscous Flow	three credit hours
Mee 522	Potential Flow	three credit hours
Mee 523	Compressible Flow	three credit hours
Mee 524	Magnetohydrodynamics	three credit hours

Mechanical Design

Mee 531	Kinematic Synthesis of Mechanisms	three credit hours
Mee 533	Structural Analysis I	three credit hours
Mee 534	Structural Analysis II	three credit hours
Mee 535	Mechanical Vibrations	three credit hours
Mee 536	Automatic Process Control	three credit hours

2. Mechanical Engineering Project

Mee 550	Mechanical Engineering Project	six credit hours
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With the approval of the Chairman, equivalent course work may be substituted for the 6 hours of Mechanical Engineering Project.

3. Electives

Electives from other Engineering Departments and from Science may be taken with the approval of the Faculty Advisor and the Department Chairman.

Examinations:

A final examination at the completion of the project is required.

SUMMARY

The School of Engineering at the present time offers graduate programs of study leading to the degrees of Master of Science in Engineering, Master of Science in Civil Engineering, Master of Science in Electrical Engineering and Master of Mechanical Engineering.

The requirements for the degree are the following:

1. Earn a minimum cumulative grade point average of 3.00 and successfully complete all courses on an approved Program of Study.
2. Submit an acceptable thesis or engineering project.
3. Satisfactorily pass an oral thesis or project examination.

In fulfilling the requirements for the degrees, certain specified conditions prevail and should be noted carefully by the student. These are the following:

1. Transfer Credits

Transfer credit is determined on an individual basis by the Committee charged with this responsibility. Refer to Page 14 for further details.

2. Course Load

Any person who is not a full-time student may register for more than six credit hours per term only with the permission of the Director of Engineering Graduate Programs.

3. Use of Advanced Undergraduate Courses

Certain undergraduate level courses may be used if approved by the student's advisor. See Page 16.

RESEARCH FACILITIES

The facilities for research at the University of Dayton are administered by the academic departments and the University of Dayton Research Institute.

FINANCIAL AID

Assistantships and industrial fellowships are available at the University of Dayton for the encouragement of graduate work and the promotion of research. They are administered by the academic departments. Detailed information for making application may be secured from the office of the Director of Engineering Graduate Programs.



VIII Departments of Instruction

Biology (BIO)

Dr. George B. Noland, *Chairman*

Any 300-400 upper level undergraduate course in biology may be taken for graduate credit under the usual conditions.

Bio 501. SEMINAR

ZERO-ONE CREDIT HOUR

The development, presentation, and discussion of papers dealing with Biological problems. Open only to advanced undergraduate and graduate Biology Majors.

Bio 502. VERTEBRATE ZOOLOGY

FOUR CREDIT HOURS

An advanced course dealing with the morphology, physiology, ecology and distribution of representative vertebrate groups. Three hours lecture and one three-hour lab per week.

Bio 509. ECOLOGY

THREE CREDIT HOURS

The course deals with the mutual relations between organisms and their environment. Some aspects of biological productivity of lakes will be included. Three hours lecture.

Bio 512. RADIATION BIOLOGY

FOUR CREDIT HOURS

A course in the theory and principles of ionizing radiation. Application of radioactive tracers to biological problems will be considered. Two hours lecture and two two-hour labs per week.

Bio 514. BIOCHEMISTRY

FOUR CREDIT HOURS

Lectures, selected readings and laboratory assignments dealing with carbohydrates, lipids, amino acids, proteins, enzymes, nucleic acids and the metabolism of those compounds. Three hours lecture and one three-hour lab per week.

Bio 515. BACTERIAL PHYSIOLOGY

THREE CREDIT HOURS

A study of the metabolic and biosynthetic activities of bacteria, accompanied by a laboratory period designed to familiarize the student with some of the basic biochemical techniques used in the study of bacterial physiology. Three hours lecture.

Bio 517. ENDOCRINOLOGY

FOUR CREDIT HOURS

A functional analysis of the mechanisms and activity of the endocrine system. Emphasis will be placed on hormonal regulation of metabolism and growth. Three hours lecture and one three-hour lab per week.

Bio 518. CYTOLOGY**FOUR CREDIT HOURS**

A study of cell structure at the organelle and the molecular levels. Where possible, fine structure will be related to cell function. Two hours lecture and two three-hour labs per week.

Bio 519. VIROLOGY**THREE CREDIT HOURS**

Lectures, selected readings and laboratory assignments dealing with the biology of plant, animal and microbial viruses. Tissue culture techniques will be considered. Two hours lecture and one three-hour lab per week.

Bio 521. BIOCHEMICAL GENETICS**THREE CREDIT HOURS**

An analysis of the nature of the gene and gene action. Particular attention will be given to genetic control of protein synthesis and to recent advances in biochemical and physiological genetics. Two hours lecture and one three-hour lab per week.

Bio 522. IMMUNOLOGY AND ADVANCED PATHOGENIC BACTERIOLOGY**THREE CREDIT HOURS**

Discussion of epidemiology, host-parasite relationships, and antigenicity with emphasis on the chemical aspect of immune response.

Bio 523. ADVANCED MICROBIOLOGY**THREE CREDIT HOURS**

Lectures and readings dealing with current concepts in basic and applied microbiology.

Bio 530. COMPARATIVE ANIMAL PHYSIOLOGY**FOUR CREDIT HOURS**

Organized on a function-system basis, the course deals with environment-organism interaction and with integrative systems of the principal phyla of animals. Three hours lecture and one three-hour lab per week.

Bio 531. EXPERIMENTAL EMBRYOLOGY**FOUR CREDIT HOURS**

Morphological and physiological aspects of development will be considered along with an introduction to teratology. Three hours lecture and one three-hour lab per week.

Bio 532. VERTEBRATE MORPHOLOGY**FOUR CREDIT HOURS**

The general biology of vertebrates with emphasis on their structural, functional and behavioral adaptations, comparative anatomy and evolutionary history. Three hours lecture and one three-hour lab per week.

Bio 534. VERTEBRATE PALEONTOLOGY**FOUR CREDIT HOURS**

The origin, evolution, dispersal and geologic history of the major groups of the Chordates with emphasis on the morphology and paleoecology of the higher classes. Three hours lecture and one three-hour lab per week, plus one field trip. Laboratory sessions to take place at the Dayton Museum of Natural History.

Bio 537. BIOSYSTEMATICS**THREE CREDIT HOURS**

A study of the principles of classification, stressing the evidence used in phylogenetic and evolutionary schema.

Bio 538. ECOLOGY II**FOUR CREDIT HOURS**

A study of the coactions of animals and plants within their environment. Particular emphasis will be given to trophic structure and bioenergetics. Three hours lecture and one three-hour lab per week.

Bio 540. PHYSIOLOGY OF HIGHER PLANTS**FOUR CREDIT HOURS**

Principles covering photosynthesis, respiration, mineral nutrition, solute transport and growth in higher plants. Three hours lecture and one three-hour lab per week.

BIO 550. BIOMETRICS**THREE CREDIT HOURS**

The design and analysis of experiments in quantitative biology. Rectilinear and curvilinear regression, correlation, and the distribution function of various statistics will be considered.

BIO 552-553. BIOLOGICAL INSTRUMENTATION**THREE CREDIT HOURS EACH TERM**

A course designed to introduce the student to the theory and use of techniques and instruments of modern biology. Required of all graduate students. One hour lecture and two three-hour labs per week.

BIO 554. ELECTRON MICROSCOPY**FOUR CREDIT HOURS**

Principles and application of electron microscope in the study of biological materials. Emphasis will be placed on fixation, dehydration, embedding, and sectioning of animal and plant tissues. Two hours lecture and two three-hour labs per week.

BIO 596. CURRENT BIOLOGICAL PROBLEMS**THREE CREDIT HOURS**

The consideration of recent developments in biological thought and procedure. By permission of Chairman only.

BIO 599. THESIS**THREE-SIX CREDIT HOURS****Business Administration (MBA)****William J. Hoben, *Dean*****MBA 501. MANAGERIAL ACCOUNTING****THREE CREDIT HOURS**

Practical emphasis on the accountant's role in business measurement techniques, communication, prediction, and decision-making based upon the use of relevant accounting information.

MBA 502. CONTROLLERSHIP**THREE CREDIT HOURS**

Analysis of the functions of controllership; emphasis upon the integration of the related areas of accounting, organization, finance, and business decision-making; the role of the chief accounting executive in planning, recording, coordinating, and controlling the financial aspects of the enterprise.

MBA 503. ACCOUNTING SYSTEMS**THREE CREDIT HOURS**

Latest concepts, methods, and advanced developments in accounting systems emphasizing the implementation of office automation; the business survey, selection of methods, designing the system, and preparing the report; the problems of communication with technical staff specialists.

MBA 510. BUSINESS INVESTIGATION AND ANALYSIS**THREE CREDIT HOURS**

Meaning of research and types of business research problems; sources of information, interpretation and application of research to special projects; use of modern machine methods in research procedure.

MBA 512. QUANTITATIVE METHODS FOR BUSINESS DECISIONS**THREE CREDIT HOURS**

Application of mathematical and statistical methods to business decision-making in the fields of marketing, production, finance and related areas; basic nature and method of operations research; the use of such techniques as linear programming, queuing problems, Monte Carlo method and Bayesian statistics.

MBA 520. FINANCIAL POLICIES OF ENTERPRISES THREE CREDIT HOURS
A study of finance with emphasis upon the financial policies and problems of business, especially within the corporation. Consideration is given to institutions and other investors in supplying funds for enterprise.

MBA 521. PROBLEMS OF FINANCE THREE CREDIT HOURS
The application of principles of finance to the financial management of corporate enterprise with special attention to the financing of expansion. Reading assignments, cases, individual reports and discussion of current financial problems.

MBA 530. MARKETING MANAGEMENT THREE CREDIT HOURS
Major areas of marketing are examined from the viewpoint of the marketing executive. Presents and develops concepts for analytical purposes, but is primarily oriented to decision-making.

MBA 531. SEMINAR IN CONSUMER BEHAVIOR THREE CREDIT HOURS
Identification and analysis of the consumer market through use of concepts from the behavioral sciences emphasizing the family life cycle, social class and family life styles.

MBA 532. PHYSICAL DISTRIBUTION MANAGEMENT THREE CREDIT HOURS
The logistics of business as a basis for marketing action. Integrates plant location, warehousing and transportation into modern marketing strategy.

MBA 540. MANAGERIAL ECONOMICS THREE CREDIT HOURS
Examination of the scope and method of managerial methods; introductory cases in managerial economics; demand analysis, forecasting demand, cases in demand; short-run cost analysis; long-run costs and production functions, cases in cost analysis; pricing, selected topics in pricing, cases in pricing decisions; capital budgeting, risk and uncertainty, cases in capital budgeting and uncertainty.

MBA 541. LABOR RELATIONS AND LABOR ECONOMICS THREE CREDIT HOURS
A study of labor relations and labor economics; collective bargaining, wage determination, structure and operation of labor markets, direction of the labor movement, theories of industrial peace and conflict; current problems and trends in labor relations.

MBA 550. GOVERNMENT AND BUSINESS THREE CREDIT HOURS
Analysis of the economic aspects and consequences of government regulations over social and business activities; a study of government and business relations.

MBA 560. OPERATIONS MANAGEMENT THREE CREDIT HOURS
An analysis of the principles of organization and management; the theory of organization and the principles of planning, directing and controlling product development, plant layout and location, equipment, inventory and production standards.

***MBA 570. BUSINESS AND SOCIETY** THREE CREDIT HOURS
Business is presented as a private and quasi-public institution between community and society with definite functions of its own as well as those which foster the dignity of man and the interests of the common good.

*Required of all students.

MBA 581. ADMINISTRATIVE MANAGEMENT PRACTICES THREE CREDIT HOURS
An in-depth analysis of concepts, principles, and theories of the management process with emphasis upon application in administrative decisions and practice. The relating of administrative management practices to the systems concept and environmental factors.
Prerequisite: A Principles of Management course.

MBA 582. HUMAN RELATIONS IN INDUSTRY**THREE CREDIT HOURS**

The application of psychology to the problems of human behavior and human relations; the problems of motivation, morale, conflict, discipline, leadership, emotions and decision-making are considered and analyzed in lectures, cases and discussions.

MBA 583. ADVANCED MANAGEMENT SEMINAR**THREE CREDIT HOURS**

An analysis in depth of several strategically important areas of management in which theory, research, and practice have progressed significantly in recent years; the applicability, potential and actual, of the newer concepts. Areas considered are: long range planning, management organization development, systems management, executive decision-making, organizational behavior, control techniques, and other selected topics.

MBA 584. MULTI-NATIONAL BUSINESS POLICY**THREE CREDIT HOURS**

Examines changes in the structure, organization, and policies of Multi-National business firms and international trade in general. Analyzes their implications relative to the composition of exports, international marketing processes, terms of trade, and determinants of payments and exchange-rate movements.

MBA 599. BUSINESS POLICIES AND ADMINISTRATIVE MANAGEMENT*THREE CREDIT HOURS**

The correlation of theory and practice in the development of business policies. Emphasis will be on the problems of executive management, decision-making and administrative action.

*Required of all students.

Chemistry (CHM)**Dr. John J. Lucier, S.M., *Chairman***

The courses marked with an asterisk are intended primarily for graduate students in Education. Prerequisite for enrolling in any of these courses for credit toward the M.S. in Education degree is standard teacher certification in the field of Physical Science or in Chemistry.

CHM 501. PRINCIPLES OF CHEMISTRY I*THREE CREDIT HOURS**

The subjects treated in this course are: atomic structure, chemical bonding, chemical equilibrium, inorganic nomenclature, theory of solutions, acid-base concepts, periodic properties of the elements, radiochemistry and nuclear reactions. Prerequisite: One year of College Chemistry.

CHM 502. PRINCIPLES OF CHEMISTRY II*THREE CREDIT HOURS**

The subjects treated in this course are: thermodynamics, chemical kinetics, redox reactions, organic chemistry (nomenclature, functional groups, preparation and properties of organic compounds). Prerequisite: Chm 501.

***CHM 525-526. PRINCIPLES OF ORGANIC CHEMISTRY** **THREE CREDIT HOURS EACH TERM**
An introduction to the fundamentals of Organic Chemistry. Prerequisite: Chm 124.

***CHM 525L-526L. PRINCIPLES OF ORGANIC CHEMISTRY** **ONE CREDIT HOUR**
Laboratory course to accompany Chm 525-526. One three-hour lab per week.

CHM 527-528. THEORETICAL PRINCIPLES OF CHEMISTRY*THREE CREDIT HOURS EACH TERM**

Prerequisite: Chm 215 or equivalent. Corequisite: Mth 218.

***CHM 527L-528L. THEORETICAL PRINCIPLES OF CHEMISTRY** **ONE CREDIT HOUR**
Laboratory course to accompany Chm 527-528. One three-hour lab per week.

- *CHM 529. INORGANIC CHEMISTRY THREE CREDIT HOURS
The nature of the chemical bond, periodicity, electron distribution in atoms, coordination compounds, the nucleus and its reactions. Prerequisite: Chm 303-304.
- *CHM 530. PHYSICAL CHEMISTRY THREE CREDIT HOURS
A concise treatment of Theoretical Chemistry. Prerequisite: Chm 124.
- *CHM 531. IDENTIFICATION OF ORGANIC COMPOUNDS ONE CREDIT HOUR
An analytical course, applying functional groups, physical properties and instrumental methods to the identification of organic compounds. Prerequisite: Chm 315-316.
- *CHM 531L. IDENTIFICATION OF ORGANIC COMPOUNDS TWO CREDIT HOURS
Laboratory course to accompany Chm 531. Two three-hour labs per week.
- *CHM 532. SPECIAL TOPICS IN THEORETICAL CHEMISTRY THREE CREDIT HOURS
A treatment of special topics surveyed in Chm 527-528. Prerequisite: Chm 304.
- *CHM 533. INTERMEDIATE ORGANIC CHEMISTRY THREE CREDIT HOURS
Modern theory of Organic Chemistry and reaction mechanisms. Prerequisite: Chm 215 or equivalent.
- CHM 540. INTRODUCTION TO QUANTUM MECHANICS THREE CREDIT HOURS
An introduction to the concepts of quantum mechanics with applications to chemical systems.
- CHM 541. TOPICS IN PHYSICAL CHEMISTRY THREE CREDIT HOURS
Crystalline state, diffraction of X-rays by crystals, methods of crystal structure analysis.
- CHM 542. STATISTICAL THERMODYNAMICS THREE CREDIT HOURS
A treatment of ensembles and their partition functions with applications to chemical systems. Bose-Einstein and Fermi-Dirac statistics will be developed.
- CHM 543. THERMODYNAMICS AND KINETICS THREE CREDIT HOURS
First, second, and third laws will be covered to develop free-energy functions for use in chemical equilibrium. Phenomenological and mathematical characterization of kinetic systems.
- CHM 544. COORDINATION CHEMISTRY THREE CREDIT HOURS
A course dealing in recent developments in the Chemistry of coordination compounds. Special emphasis will be placed on ligand field theory, substitution processes, and ligand stabilization of metal ions.
- CHM 545. INORGANIC REACTIONS AND STRUCTURE THREE CREDIT HOURS
A survey of modern inorganic chemistry including non-aqueous solvents, trends in the periodic table, acid base theory, and reaction mechanisms.
- CHM 546. CHEMICAL SPECTROSCOPY THREE CREDIT HOURS
An introduction to the treatment of molecular rotations and vibrations, including some applications of group theory, as well as applications of infrared spectroscopy, nuclear magnetic resonance, and ultraviolet spectroscopy as aids in determining molecular structure.
- CHM 547. BONDING IN INORGANIC COMPOUNDS THREE CREDIT HOURS
Topics will include atomic theory; bonding theories, especially molecular orbital theory; the ionic model; band theory of metals; and the structure of solids. Prerequisite: Quantum Chemistry.

CHM 548. ADVANCED ORGANIC CHEMISTRY I THREE CREDIT HOURS
A course dealing with nucleophilic substitution, B elimination, and condensation reactions, free radicals, carbanions, acidities, and linear free energy relationships.

CHM 549. ADVANCED ORGANIC CHEMISTRY II THREE CREDIT HOURS
Topics discussed include the Chemistry of multiple bond systems, resonance aromaticity, electrocyclic additions, carbenes, oxidation reduction, electrophilic substitution and addition reactions.

CHM 550. SPECIAL TOPICS IN ORGANIC CHEMISTRY THREE CREDIT HOURS
Modern physical organic chemistry, spectroscopy, photochemistry, molecular rearrangements, stereochemistry and natural products.

CHM 551. BIOCHEMISTRY THREE CREDIT HOURS
Review of structure of carbohydrates, lipids and proteins, followed by the metabolic path of each group; energy metabolism, inorganic metabolism and enzyme systems will also be treated. Prerequisite: Chm 420 or equivalent.

CHM 552. SPECIAL TECHNIQUES IN BIOCHEMISTRY THREE CREDIT HOURS
This course comprises the study of cellular respiration, enzyme kinetics, chemical and physical methods of biochemical analysis, and the use of radioisotopes in metabolism by means of special equipment such as the Warburg microrespirometer, recording spectrophotometer, recording oxygen cathode, fluorometer, high speed centrifuge, paper electrophoresis, and radioisotope scintillation tube with attached scaler.

CHM 560-561. RESEARCH THREE CREDIT HOURS EACH TERM

Economics (ECO)

Dr. George E. Matlin, *Chairman*

Prerequisite for enrolling in any of the following courses for credits toward the M.S. in Education degree is Eco 201-202 Principles of Economics or the equivalent.

ECO 501. ADVANCED PRINCIPLES OF ECONOMICS THREE CREDIT HOURS
A review and analysis of the fundamental principles underlying the economic system.

ECO 503. HISTORY OF ECONOMIC DOCTRINE THREE CREDIT HOURS
Development of economic concepts and theories from the Mercantilists to the present period.

ECO 505. CONSUMER ECONOMICS THREE CREDIT HOURS
A study of the economic forces which influence the consumer in his choice and use of goods and services; and of the public and private agencies which afford protection, information, and assistance to the consumer.

ECO 507. CURRENT ECONOMIC PROBLEMS THREE CREDIT HOURS
An analysis and discussion at an advanced level of current economic issues and problems.

ECO 520. ECONOMICS OF GOVERNMENT THREE CREDIT HOURS
A survey of government and business relationships in the American economy and the impact of government on private enterprise.

ECO 525. GRADUATE SEMINAR IN ECONOMICS THREE CREDIT HOURS
Special studies and discussions of economic problems and trends.

EducationDr. Joseph J. Panzer, S.M., *Dean*

- EdE 325. SOCIAL STUDIES IN THE ELEMENTARY SCHOOL THREE CREDIT HOURS
- EdE. 431. VISUAL AND OTHER SENSORY AIDS IN EDUCATION TWO CREDIT HOURS
- EdE. 451. ADVANCED KINDERGARTEN-PRIMARY INSTRUCTION THREE CREDIT HOURS
Prerequisite: EdE 219 Kindergarten Instruction or equivalent.
- EdS. 455. PRACTICUM IN HIGH SCHOOL READING IMPROVEMENT TWO CREDIT HOURS
Prerequisite: EdS 405.
- EdE 480. THE PSYCHOLOGY OF SLOW LEARNING CHILDREN TWO CREDIT HOURS
Enrollment limited to teachers with positions (or prospective positions) in special education.
- EdE 484. LANGUAGE ARTS FOR SLOW LEARNING CHILDREN TWO CREDIT HOURS
Prerequisite: EdE 480.
- EdE 485. SOCIAL STUDIES FOR SLOW LEARNING CHILDREN TWO CREDIT HOURS
Prerequisite: EdE 480.
- EdE 486. ARITHMETIC FOR SLOW LEARNING CHILDREN TWO CREDIT HOURS
Prerequisite: EdE 480.
- EdE 487. OCCUPATIONAL ORIENTATION AND JOB TRAINING TWO CREDIT HOURS
A course in special education for teachers of slow learning children. Prerequisite: EdE 480.
- EdE 488. MATERIALS OF INSTRUCTION FOR SLOW LEARNING CHILDREN TWO CREDIT HOURS
Prerequisite: EdE 480.
- EdE 500. MATHEMATICS IN ELEMENTARY GRADES TWO CREDIT HOURS
A graduate course (or workshop) designed for teachers and school supervisors of the Modern Arithmetic Program. Demonstration of how the logical patterns of mathematical thought which are inherent in arithmetic can be readily acquired by pupils.
- EdF 501. ADVANCED PSYCHOLOGY OF LEARNING THREE CREDIT HOURS
A conscious effort to relate learning theories and current issues in the psychology of learning to major aspects of growth and development.
- EdF 502. COMPARATIVE PHILOSOPHIES OF EDUCATION THREE CREDIT HOURS
The historical development of educational philosophies; evaluation of major current philosophies; significant problems of the present day in educational philosophy. Prerequisite: EdF 419 Philosophy of Education, or equivalent where the student has already achieved a norm for evaluating the theories of modern education.
- EdF 503. RESEARCH METHODOLOGY AND STATISTICS THREE CREDIT HOURS
Designed to develop an understanding of the nature of research: methods, research techniques, sources, evaluation of research studies. Considers basic statistical concepts and their application in the analysis of education data.
- EdF 504. ADVANCED CHILD AND ADOLESCENT PSYCHOLOGY THREE CREDIT HOURS
Deals with the principal areas of growth and development through adolescence with special emphasis on mental development.

EdA 506. SCHOOL ADMINISTRATION**THREE CREDIT HOURS**

General principles governing the administrative functions of planning, organizing, and controlling are presented and applications are made in the administration of both elementary schools and secondary schools.

EdA 507W. THE PRINCIPALSHIP OF THE CATHOLIC ELEMENTARY SCHOOL**TWO CREDIT HOURS**

This workshop seeks to apply the principles of administration to the Catholic Elementary School. Particular attention is placed upon human relationships, in-service education of the professional staff, securing community participation in school policy formation, pupil personnel problems, curriculum development, and managerial responsibilities of the principal.

EdA 509. SCHOOL SUPERVISION**THREE CREDIT HOURS**

A course in planning, organizing, and administering instructional supervision in public and private (parochial) school systems. Field observation required.

EdA 510W. CURRICULUM OF THE CATHOLIC ELEMENTARY SCHOOL**TWO CREDIT HOURS**

A curriculum development workshop designed for implementation in the Catholic elementary schools. It includes consideration of the necessity of a complete system of Catholic education and the principles which dictate this necessity.

EdA 511. ELEMENTARY SCHOOL CURRICULUM**TWO CREDIT HOURS**

A fundamental course in curriculum development designed to prepare the student for effective participation in cooperative efforts to improve the curriculum. Attention is directed to curriculum issues and to desirable instructional practices in the major areas of curriculum.

EdA 512. SECONDARY SCHOOL CURRICULUM**TWO CREDIT HOURS**

A fundamental course in curriculum development designed to prepare the student for effective participation in cooperative efforts to improve the curriculum. Attention is directed to curriculum issues and to desirable instructional practices in the major curriculum areas.

EdA 513. ELEMENTARY SCHOOL EVALUATION**TWO CREDIT HOURS**

Centers attention on systematic, total school self-evaluation as the basis for school improvement programs.

EdA 514. SECONDARY SCHOOL EVALUATION**TWO CREDIT HOURS**

Centers attention on systematic, total school self-evaluation as the basis for school improvement programs.

EdA 515. SCHOOL LAW**TWO CREDIT HOURS**

Problems in school administration which may give rise to court action.

EdA 516. SCHOOL PLANT**TWO CREDIT HOURS**

The course will cover types of school facilities, considerations in working with architects, remodeling and new construction, site selection, government financing, space utilization, and other aspects dealing with the overall educational plant.

EdA 517. SCHOOL FINANCE**TWO CREDIT HOURS**

A course for school administrators covering principles of school finance, technical problems of budgeting, source of income, purchasing, accounting, and debt service.

EdF 518. SCHOOL AND THE SOCIAL ORDER**THREE CREDIT HOURS**

The relationship of the school to the total cultural pattern and the development of interaction between school and community are appraised and concrete suggestions are presented. The nature of the individual child and his relations with society and culture; the special culture of the school and its accompanying social world; school, teacher, and community relations.

EdA 521. SCHOOL PUBLIC RELATIONS**TWO CREDIT HOURS**

Covers philosophy and techniques of school-community relations for educational leaders. Attention given to parent contacts, citizens' participation, press, radio, television, printed material and other media.

EdC 522. PRINCIPLES AND TECHNIQUES OF GUIDANCE**THREE CREDIT HOURS**

An introduction to the scope, aims, and techniques of guidance; an introductory treatment of the basic guidance services and how the counselor and the teacher can make efficient use of them.

EdC 524. EDUCATIONAL AND OCCUPATIONAL INFORMATION**TWO CREDIT HOURS**

Selection, utilization, and evaluation of educational and occupational information materials; familiarization with standard labor market data, current requirements for admission into college curricula, and available sources of placement; a usable knowledge of printed and personal reference sources in these fields.

EdC 525. USE OF COMMUNITY RESOURCES IN GUIDANCE**TWO CREDIT HOURS**

Familiarization with availability of services in appraisal, guidance; local information and placement (methods of procedure and cooperation with medical, pastoral, social welfare, mental, educational, industrial, labor, commercial, governmental and recreational agencies).

EdS 527W. BUSINESS SYSTEMS AND DATA PROCESSING**THREE CREDIT HOURS**

A graduate workshop in business automation, related procedures, and equipment; designed to develop a program of approach the secondary schools can use in educating students in office automation and business data processing. Explanation of the Cooperative Office Education Program of the Department of Education, State of Ohio, is included. This workshop fulfills a requirement for COE certification. Prerequisite: High School Certification in Business Education.

EdC 530. PSYCHOLOGY OF INDIVIDUAL DIFFERENCES**TWO CREDIT HOURS**

Nature, extent, and significance of variability; hereditary and cultural influences; theories of intelligence; trait organization; group differences.

EdC 531. DYNAMICS OF PERSONALITY**THREE CREDIT HOURS**

Required of all graduate students who are enrolled in the School Counseling, School Psychology, and Pupil Personnel programs. Personality theory and abnormal psychology are discussed with emphasis on dynamics of personal behavior.

EdC 533. PSYCHOMETRICS**TWO CREDIT HOURS**

Lectures and demonstrations in the principles and application of psychological measurement, with particular emphasis on standardized group tests of intelligence and scholastic achievement, interest tests, personality tests, and other areas pertinent to the graduate function. Practicum in test selection, use, and interpretation. Prerequisite: EdF 503.

EdC 535. PRACTICUM I: TEST INTERPRETATIONS AND CASE STUDIES**TWO CREDIT HOURS**

Supervised experiences in typical school guidance policies and practices. Such experience will include: vocational guidance, educational guidance and curriculum structures, cumulative folder, test and profile interpretations. Prerequisites: EdC 522, 533.

EdC 539. ADMINISTRATION OF A SCHOOL GUIDANCE PROGRAM**TWO CREDIT HOURS**

Planning, developing and administering school testing and guidance services and group guidance in the homeroom. This course covers also such matters as in-service training of guidance personnel, facilities, supplies, assembling and disseminating educational and occupational information, and liaison with both teachers and school administrators.

EdC 543. PRINCIPLES AND TECHNIQUES OF COUNSELING**THREE CREDIT HOURS**

Basic theories, principles and techniques of counseling. A consideration of directive, non-directive and eclectic techniques as a function of the intelligence and grade-level of the child; ethical considerations. Prerequisites: EdC 522; recommended, EdC 531.

EdC 545. PRACTICUM II: COUNSELING TECHNIQUES**THREE CREDIT HOURS**

Supervised experience in counseling, using role-playing and actual counseling cases. Both group and individualized instruction and supervision. Prerequisites: EdC 524, 533, 543.

EDE 547. PSYCHOLOGY OF EXCEPTIONAL CHILDREN**THREE CREDIT HOURS**

Deals with the intellectual deviate, the socially and emotionally maladjusted. Concentration on educational guidance for the gifted and the mentally retarded.

EDE 560. UNIT TEACHING**THREE CREDIT HOURS**

Designed to help organize the teaching of science and social science in units. Emphasis on local relevance, concept formation, group dynamics, and individualizing of learning. Actual application in the classroom. (Restricted to participants in the cooperative teaching centers.)

EDE 561. ANALYSIS OF INSTRUCTION**THREE CREDIT HOURS**

To enable the teacher to increase his awareness of the effect that his teaching behavior has upon pupils; to increase his proficiency in distinguishing between his expectations and the resulting pupil behavior; to become expert in recognizing and overcoming the natural defensive reaction when outcomes in pupil behavior differ from teacher expectations. (Restricted to participants in the cooperative teaching centers.)

EDE 562. NEW MEDIA AND METHODS IN ELEMENTARY EDUCATION**THREE CREDIT HOURS**

A study of new problems, trends, innovations in the elementary school. Actual use and evaluation in the classroom. (Restricted to participants in the cooperative teaching centers.)

EDE 563. SUPERVISION OF STUDENT TEACHING**THREE CREDIT HOURS**

Demonstration of procedures and use of instruments to determine the student teacher's readiness and to guide his progress. Prerequisites: EDE 561, 562. (Restricted to participants in the cooperative teaching centers.)

- EdE 564. ADVANCED SCIENCE IN ELEMENTARY SCHOOL** THREE CREDIT HOURS
 This course or workshop is designed to train elementary school teachers to integrate science with all phases of the curriculum—by research projects in the basic areas of astronomy, biology, chemistry, geology, physics, and air-age education. Teachers also have the opportunity to study and evaluate the visual aids now available in the field of science. Prerequisite: EdE 460 Science in the Elementary School or another college course in physical science.
- EdE 567. SURVEY OF RESEARCH IN READING INSTRUCTION** THREE CREDIT HOURS
 A basic course for experienced teachers concerned with the psychology of learning Reading and with current problems and trends. The first course in a program designed to prepare specialists in Reading.
- EdE 568. DIAGNOSIS AND CORRECTION OF READING DIFFICULTIES** THREE CREDIT HOURS
 A study of the common causes for Reading disabilities or lack of adequate development in Reading. Also involves the study of types of observation and measurement to be used to identify disabilities and methods of instruction useful in correction.
- EdE 569. PRACTICUM IN READING** THREE CREDIT HOURS
 This is a laboratory course to be taken in connection with Diagnosis and Correction of Reading Difficulties. The students will become acquainted with the machines and materials in development, improvement, and remediation and will be given experience in dealing with individuals and groups of children.
- EdE 570. SUPERVISION AND CURRICULUM IN READING** THREE CREDIT HOURS
 A study of selected curricula and the processes of planning a sound curriculum in Reading at different levels. It outlines the role of the Reading supervisor, providing guidelines for effective implementation of Reading programs.
- EdA 571W. EVALUATION OF CATHOLIC ELEMENTARY SCHOOLS** TWO CREDIT HOURS
 This workshop is designed to enable Catholic school administrators to engage in depth studies relative to the evaluative criteria. The participants will engage likewise in discovering ways and means of implementing the criteria in their own schools or school systems.
- EdC 572. THE SCHOOL PSYCHOLOGIST: ROLE AND FUNCTION** TWO CREDIT HOURS
 Selected topics of current significance in the profession of school psychology, with special emphasis on ethics, interpersonal relationships in the school and community, research methodology and current practices in the field.
- EdC 576. CHILD AND ADOLESCENT PERSONALITY EVALUATION I** FOUR CREDIT HOURS
 History and objectives of intelligence testing. Methods utilized in the construction of intelligence tests. Intensive experience in administering the Wechsler, Binet, and Illinois Test of Psycholinguistic Abilities.
- EdC 577. CHILD AND ADOLESCENT PERSONALITY EVALUATION II** FOUR CREDIT HOURS
 History and rationale of projective tests. Instruction in the administration and use of the Rorschach, Bender Gestalt, TAT, and such other projectives commonly used by the school psychologist. Laboratory experience is provided.
- EdC 580. GUIDANCE IN THE ELEMENTARY SCHOOL** THREE CREDIT HOURS
 A study of the most important concepts and techniques of guidance, with emphasis on the functions and responsibilities of the elementary teacher and counselor.

- EdC 581. COUNSELING IN THE ELEMENTARY SCHOOL THREE CREDIT HOURS
An introduction to the principles and techniques of counseling elementary school children.
- EdC 583. GROUP GUIDANCE THREE CREDIT HOURS
This course has two purposes: (1) to enable the counselor to work effectively with groups; and (2) to achieve the formation of deeper counselor self-understanding by actually participating in the group process. (One quarter of class time is devoted to lectures and three quarters to participation.)
- EdC 584. CHILD STUDY PROJECT I TWO CREDIT HOURS
During the first year, each teacher studies one child, seeking and sharing sources of information about the child and developing skills in observing and recording data. Each teacher practices anecdotal recording and builds multiple hypotheses concerning causes of behavior. (Groups meet every other week from the first of October to the middle of May for a total of at least fifteen to eighteen sessions. The meetings last 1½ to 2 hours. A University consultant visits each group at least three times a year. Confidential anecdotal records are deposited with the University.)
- EdC 585W. CHILD STUDY LEADERSHIP I TWO CREDIT HOURS
This workshop is designed to train teachers and school counselors for leadership roles in the Child Development Laboratory as conducted within approved school systems. It is in cooperation with the University of Maryland's sponsored Institute for Child Study. Provides training to persons who plan to participate as group members or leaders in the Child Study Program sponsored by the Institute. The workshop will provide suitable experience in its own right for persons whose role in schools can be enhanced through deeper understanding of children and youth, e.g., area principals.
- EdC 586. CHILD STUDY PROJECT II TWO CREDIT HOURS
During the second year, each teacher studies a different child from the one studied the first year. Together with the other participants, he develops a systematic, organized picture of the forces that interact to produce the child's behavior. He classifies behavior for greater understanding of the child's developmental pattern. Prerequisite: EdC 584.
- EdC 587W. CHILD STUDY LEADERSHIP II TWO CREDIT HOURS
An advanced Child Study Workshop emphasizing the major factors that affect human behavior. Prerequisite: EdC 585W.
- EdC 588. CHILD STUDY PROJECT III TWO CREDIT HOURS
The third year sees the teacher again studying one child, still different from the first two years, and attempting to achieve fuller understanding of the self-dynamics. Here he endeavors to perceive his pupils from the point of view of the learner. He studies how the individual functions, what his effect is on the group, and what the group's effect is on him. Prerequisite: EdC 586.
- EdC 589W. CHILD STUDY LEADERSHIP III TWO CREDIT HOURS
An advanced Child Study Workshop emphasizing the child's self-concept and his relationship with the world around him. Prerequisites: EdC 585W, EdC 587W.
- EdF 590. EDUCATIONAL RESEARCH DESIGN THREE CREDIT HOURS
This course has two major emphases: Part I is devoted to basic processes of scientific inquiry into educational problems; Part II is devoted to selected techniques which stress in greater detail specific methodological problems.

EdF 591. RESEARCH PROJECT**THREE CREDIT HOURS**

In special cases and with permission of the Dean, students may register for this course in lieu of EdF 592, Graduate Seminar.

EdF 592. GRADUATE SEMINAR**THREE CREDIT HOURS**

Provides students with general guidance in conducting their Research Projects and in preparing for the oral comprehensive examination. Emphasis is on the integration of the total graduate program. Should be taken after the student has completed all, or most, of his course work.

EdF 593. INTERPRETATION OF STATISTICS**THREE CREDIT HOURS**

The emphasis of this course is placed upon descriptive and inferential statistics. Descriptive statistics are used to describe observations of groups of individuals. Inferential statistics are used to make inferences about the total parameters in terms of observed samples and to draw valid inferences and interpretations.

EdC 594-595. INTERNSHIP FOR SCHOOL PSYCHOLOGISTS**TWELVE CREDIT HOURS**

A job-related program for nine months under the immediate supervision of a trained school psychologist. The internist will be given a stipend, made available from the State of Ohio Foundation funds.

EdF 596-697. INTERNSHIP IN EDUCATION RESEARCH**TWELVE CREDIT HOURS**

Investigation of the literature of education research; experiences in developing research design; applications of data processing; conduct of major research activity. The Southwestern Ohio Educational Research Council and area schools are used as a locus of operations.

EdS 598. INTERNSHIP IN TEACHING**EIGHT CREDIT HOURS**

A full semester of directed teaching experiences under the supervision of a faculty advisor and of selected master teachers in local area schools. Weekly seminars on campus.

EdC 599. INDIVIDUAL STUDIES IN GUIDANCE AND COUNSELING**THREE CREDIT HOURS**

Graduate students following Plan B are required to complete an individual study in Guidance designed to further their competence in the field. The design of each Study is elaborated by the student with his advisor and approved by the department chairman.

Chemical Engineering (CME)**Dr. Michael A. Bobal, *Chairman*****CME 507. ADVANCED THERMODYNAMICS****THREE CREDIT HOURS**

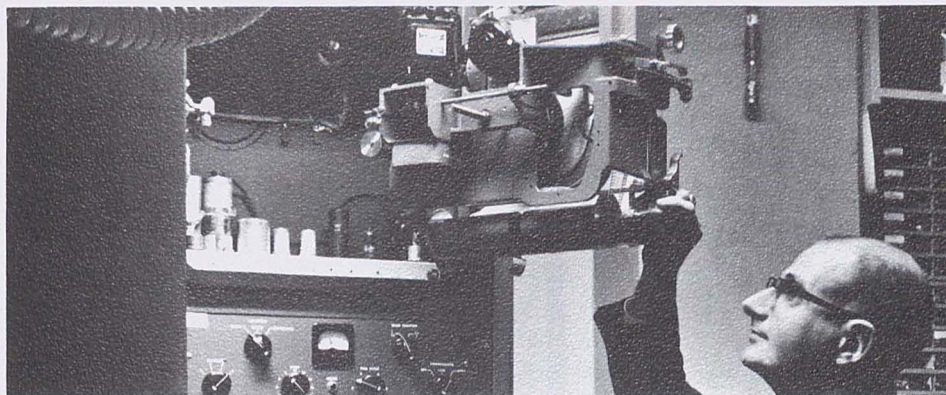
Applications of the laws of thermodynamics—Phase equilibria in ideal and nonideal systems—Chemical Equilibrium.

CME 508. ADVANCED TOPICS IN CHEMICAL ENGINEERING**THREE CREDIT HOURS**

Study and discussion of current problems in Chemical Engineering Research. Prerequisites: Cme 521, Cme 581, Cme 582.

CME 521. ADVANCED TRANSPORT PHENOMENA**THREE CREDIT HOURS**

Applications of the principles of momentum and heat transfer to steady state and transient problems. Potential flow, boundary layer theory. Prerequisite: Cme 581.



CME 522. SEPARATION PROCESSES **THREE CREDIT HOURS**
A study of mass transfer in Binary and Multicomponent systems. Absorption. Distillation. Extraction.

CME 541. PROCESS DYNAMICS **THREE CREDIT HOURS**
Application of dynamic analysis techniques to the study of non-steady state chemical processes.

CME 542. CHEMICAL ENGINEERING KINETICS **THREE CREDIT HOURS**
Theory of absolute reaction rates, mass and heat transfer in catalytic beds.

CME 581. ADVANCED CHEMICAL ENGINEERING CALCULATIONS I **THREE CREDIT HOURS**
Applications of ordinary and partial differential equations to engineering problems. Classical methods of solution.

CME 582. ADVANCED CHEMICAL ENGINEERING CALCULATIONS II **THREE CREDIT HOURS**
Analysis and design of processes and the solution of the resulting differential equations by computer techniques.

CME 598. SPECIAL PROBLEMS IN CHEMICAL ENGINEERING **TWO TO SIX CREDIT HOURS**
Particular assignments to be arranged and approved by the Chairman of the department.

CME 599. GRADUATE ENGINEERING THESIS **SIX CREDIT HOURS**
Students engaged in thesis research must enroll for this course for a total of six credit hours.

Civil Engineering (CIE)

Seymour J. Ryckman, *Chairman*

CIE 500. ADVANCED STRUCTURAL ANALYSIS **THREE CREDIT HOURS**
Methods of moment-areas, matrix analysis, moment distribution and virtual work. Includes consideration of such problems as frames of variable cross section, plates and shells, space frames and plastic design. Prerequisite: Cie 407, Egm 304. (Open for enrollment of undergraduate students.)

CIE 502. PRESTRESSED CONCRETE **THREE CREDIT HOURS**
Discussion of the properties of concrete and prestressing steel. Theory and design of prestressed concrete beams, slabs, circular tanks and rigid frames. Prerequisite: Cie 407. (Open for enrollment of undergraduate students.)

CIE 520. ADVANCED SOIL MECHANICS THREE CREDIT HOURS
Treatment of the theories of conventional soil mechanics. Detailed study and analysis of the static and dynamic properties of soils, with applications to foundation behavior. Prerequisite: Cie 312. (Open for enrollment of undergraduate students.)

CIE 524. FOUNDATION DESIGN THREE CREDIT HOURS
Analysis of earth pressure, stability of natural slopes and bearing capacity of soil; design of spread foundations, pile foundations, beams on elastic foundations, anchored bulkheads, caissons, and cofferdams. Prerequisite: Cie 312. (Open for enrollment of undergraduate students.)

CIE 540. HIGHWAY GEOMETRIC DESIGN THREE CREDIT HOURS
Design controls and criteria, vehicle capacity, sight distance, intersection and interchange design. Prerequisite: Cie 405. (Open for enrollment of undergraduate students.)

CIE 544. TRAFFIC ENGINEERING THREE CREDIT HOURS
Characteristics of traffic, including the road user, the vehicle, origin, and destination surveys; traffic regulation, control devices and aids, design, administration and planning. Prerequisite: Cie 405. (Open for enrollment of undergraduate students.)

CIE 558. TRAFFIC ENGINEERING RESEARCH THREE CREDIT HOURS
Problems in control or capacity restraints based on studies of local situations.

CIE 560. ADVANCED SANITARY ENGINEERING THREE CREDIT HOURS
Stream pollution control and design of water and waste treatment plants and sewers. Prerequisites: Cie 433, Cie 434. (Open for enrollment of undergraduate students.)

CIE 562. INDUSTRIAL WASTE TREATMENT THREE CREDIT HOURS
Nature and quality of specific industrial wastes and water supplies, treatment and disposal of industrial wastes. Prerequisites: Cie 433, Cie 434. (Open for enrollment of undergraduate students.)

CIE 580. HYDROLOGY AND SEEPAGE THREE CREDIT HOURS
The deposition, movement and infiltration of water as related to the hydrologic cycle and groundwater hydraulics; a study of the theory of flow in porous media with application to dams, excavations, and other foundation problems. Prerequisites: Cie 307, Cie 312. (Open for enrollment of undergraduate students.)

CIE 582. ADVANCED HYDRAULICS THREE CREDIT HOURS
Problems and study involving open channel flow, draw down curves, hydraulics of dams, spillway, models, and water distribution systems. Prerequisite: Cie 307. (Open for enrollment of undergraduate students.)

CIE 598. SPECIAL PROBLEMS IN CIVIL ENGINEERING TWO TO SIX CREDIT HOURS
Subject material in Civil Engineering and assignments to be arranged and approved by the Department Chairman and the Director of the Graduate Study Committee, School of Engineering.

CIE 599. THESIS SIX CREDIT HOURS
Thesis topic to be arranged by student with approval of Thesis Advisor. Student must enroll for this course with total credit of 6 credit hours.

Electrical Engineering (ELE)Bro. Louis Rose, S.M., *Chariman***ELE 501. ANALOG AND DIGITAL COMPUTERS****THREE CREDIT HOURS**

Use of differential analyzers for solving linear integral-differential equations; digital computers and their design; input and output equipment; control unit. Prerequisite: Ele 313. (Open for enrollment of undergraduate students.)

ELE 502. ADVANCED CIRCUIT ANALYSIS**THREE CREDIT HOURS**

Poles and zeros of polynomial functions and networks; numerical procedures; Chebyshev and Taylor approximations to brick wall functions; elementary and modern synthesis; low pass and band pass amplifiers; feedback amplifiers and stability. Prerequisites: Ele 413, Mth 219. (Open for enrollment of undergraduate students.)

ELE 505. QUANTUM ELECTRONICS: PRINCIPLES**THREE CREDIT HOURS**

Principles of quantum theory; classical and quantum statistics; many-particle systems; electromagnetic interactions with materials. Prerequisite: Ele 414 or equivalent.

ELE 507. ELECTROMAGNETIC FIELDS I**THREE CREDIT HOURS**

Fundamental concepts; introduction to waves; theorems of electromagnetics; plane wave function; cylindrical wave functions. Prerequisite: Ele 334.

ELE 508. ELECTROMAGNETIC FIELDS II**THREE CREDIT HOURS**

Spherical wave functions; perturbational and variational techniques; microwave networks. Prerequisite: Ele 507.

ELE 509. ANALYSIS OF LINEAR SYSTEMS**THREE CREDIT HOURS**

Modern methods of analysis of transient phenomena in electrical, mechanical, and thermal linear systems involving lumped and distributed parameters. (Consent of instructor.)

ELE 513. COMMUNICATION THEORY**THREE CREDIT HOURS**

The application of Fourier series and integrals to the analysis of communication problems; theory of random signals, autocorrelation, power density spectra, and optimum filters. Prerequisite: Ele 413.

ELE 514. ANALYSIS OF NON-LINEAR SYSTEMS**THREE CREDIT HOURS**

An advanced study of methods of analysis of non-linear systems with applications in the fields of electric circuit theory and control systems. Prerequisite: Ele 509.

ELE 515. AUTOMATIC CONTROL THEORY**THREE CREDIT HOURS**

Representation and analysis of feedback control systems; Nyquist plots; Bode diagrams; the root-locus method and signal-flow diagrams; introductory treatment of sampled data systems. (Consent of instructor.)

ELE 516. GASEOUS ELECTRONICS AND PLASMAS**THREE CREDIT HOURS**

Transport theory; magnetic hydrodynamics; plasma oscillation. (Consent of instructor.)

ELE 520. MAGNETIC MATERIALS AND SUPERCONDUCTORS**THREE CREDIT HOURS**

Atomic magnetism; spin structures; elementary processes and bulk properties; metallic magnetic materials for dc, power, electronic uses; ferrites; permanent magnets; superconductivity; crytron, tunneling devices. Prerequisites: Ele 334 or consent of instructor.

ELE 521. CONDUCTORS AND DIELECTRICS THREE CREDIT HOURS
 Ionic and metallic conduction; thermoelectric phenomena; conductors for various engineering application; physics of "non-conductors"; ferro-electricity; electrets; piezoelectricity; optical properties; specialty materials. Prerequisite: Ele 520 or consent of instructor. Corequisite: Ele 505.

ELE 522. MAGNETIC MEASUREMENTS THREE CREDIT HOURS
 Magnetic material properties; quantities and units. Field generation; measurement of field strength, static magnetization and induction; permeability, induction and iron losses, etc. at power frequencies; resonance phenomena; special measurements; magnetostriction, magnetocaloric and magneto-optic effects. Prerequisite: Ele 520 or consent of instructor.

ELE 523. PERMANENT MAGNETS THREE CREDIT HOURS
 Definition and basic types; engineering uses of permanent magnets; physics of permanent magnets' fine particle theory. Measurement of permanent properties; design with permanent magnets; present research activities. This course is designed to prepare students for research work on permanent magnets. Corequisite: Ele 520 or consent of instructor.

ELE 598. SPECIAL PROBLEMS IN ELECTRICAL ENGINEERING TWO-SIX CREDIT HOURS
 Particular assignments to be arranged and approved by the chairman of the department.

ELE 599. THESIS SIX CREDIT HOURS
 Students engaged in thesis research must enroll for this course for a total of six credit hours.

Engineering (EGR)

EGR 501. APPLIED ELASTICITY THREE CREDIT HOURS
 Equations of equilibrium and continuity; solution of two-dimensional problems in rectangular and curvilinear coordinates by means of stress functions; St. Venant's principle; energy methods; stress concentrations; introduction to three-dimensional and thermal stress problems; application of finite difference equations. Prerequisite: Egm 304.

EGR 502. MECHANICS OF FLUIDS THREE CREDIT HOURS
 Fluid properties; important differential equations in fluid flow, laminar and turbulent flow, boundary layer flow; introduction to compressible flow.

EGR 503. THERMODYNAMICS THREE CREDIT HOURS
 Thermodynamic concepts; the laws of thermodynamics; kinetic theory of gases; introduction to the Maxwell-Boltzmann statistics and their applications.

EGR 504. MASS AND ENERGY TRANSPORT THREE CREDIT HOURS
 Basic concepts, principles and definitions, rate equations, thermodynamic principles, applications.

EGR 505. PROPERTIES OF MATERIALS THREE CREDIT HOURS
 Structure, properties, and behavior of materials. Conductivity, diffusivity, electrochemistry, elasticity, plasticity, fracture, viscosity.

EGR 506. SOLID STATE DEVICES THREE CREDIT HOURS
 Introduction to the theory of solid state devices; electron emission devices, semiconductor devices, dielectric devices, and magnetic devices. Mathematical technique beyond differential equations will be developed as needed.

EGR 517. TRANSPORT PROPERTIES THREE CREDIT HOURS
 Momentum, energy and mass transport including viscosity and mechanism of momentum transport, thermal conductivity and mechanism of energy transport, diffusivity and the mechanisms of mass transport. Prerequisite: Cme 581 or Mth 403.

EGR 518. COMPRESSIBLE FLOW THREE CREDIT HOURS
 One-dimensional compressible flow, two- and three-dimensional subsonic flow, two-dimensional supersonic flow, mixed flow, and flow of real gases with viscosity and heat conductivity. Prerequisite: Egr 502 or Mth 403.

EGR 519. ANALYTIC DYNAMICS THREE CREDIT HOURS
 Kinematics, relative motion, constraints and generalized coordinates, Hamilton's principle, Lagrange's equations, variational principles. Applications to particle dynamics and rigid body motion. Prerequisites: Egm 301, Mth 219, or equivalent.

EGR 521. THEORETICAL SOIL MECHANICS THREE CREDIT HOURS
 General principles involved in the theories of soil mechanics. Discussion includes stress conditions for failure, active and passive pressure, plastic equilibrium in a semi-infinite mass, bearing capacity, semi-infinite elastic solids and subgrade reaction. Prerequisite: Cie 312.

EGR 522. PHILOSOPHICAL FOUNDATIONS OF ENGINEERING THREE CREDIT HOURS
 The place of engineering and the engineer in present day society. The philosophical bases for engineering enterprise and the meaning of engineering achievement (May be replaced by a suitable graduate philosophy course.)

EGR 525. AUTOMATIC CONTROL THEORY THREE CREDIT HOURS
 System representation, steady state and transient analysis of feedback control systems, modes of control, Laplace transform, root-locus method, analog computers and frequency-response methods.

EGR 598. SPECIAL PROBLEMS IN ENGINEERING SCIENCE TWO TO SIX CREDIT HOURS
 Particular assignments to be arranged and approved by the Chairman, Graduate Study Committee, School of Engineering.

EGR 599. GRADUATE ENGINEERING THESIS SIX CREDIT HOURS
 Students engaged in thesis research must enroll for this course for a total of six credit hours.

Engineering Mechanics (EGM)

EGM 501. EXPERIMENTAL STRESS ANALYSIS TWO CREDIT HOURS
 A study of the experimental analysis of stress as an aid to design for strength and economy with emphasis on electrical strain gauges. Also covered are photoelasticity, brittle coatings, photoelastic coatings, analogies, structural similitude. Prerequisite: Egm 304; Corequisite: Egm 501L.

EGM 501L. EXPERIMENTAL STRESS ANALYSIS LABORATORY ONE CREDIT HOUR
 Experiments and problems to acquaint the student with the basic techniques of the use of strain gauges, photoelasticity, and brittle coatings in stress analysis. Corequisite: Egm 501.

Industrial Engineering (INE)

Robert I. Mitchell, *Chairman*

INE 501. ANALYSIS OF ENGINEERING DATA THREE CREDIT HOURS

A study of statistical techniques especially applicable to industrial experimentation and research. Principles of analysis of variance and design of experiments and multiple correlation. Emphasis upon the theory underlying various techniques.

INE 502. SIMULATION TECHNIQUES IN OPERATIONS RESEARCH THREE CREDIT HOURS

The construction of models which simulate real systems, the use of random numbers in obtaining sample observation of the model, and the inference of system properties from samples of observations of the model.

INE 503. MATHEMATICAL PROGRAMMING OF INDUSTRIAL PROBLEMS

THREE CREDIT HOURS

Development of analytical techniques for the solution of engineering and economic problems. Construction of mathematical models, with emphasis on linear models and linear programming.

INE 506. ADVANCED WORK STUDY

THREE CREDIT HOURS

Introduction to the latest developments in assembly methods, including selection of cycle time, assembly line balancing, sequencing of mixed models, and automatic assembly methods. Technical, economic and human aspects of both processing and assembly work.

INE 507. ADVANCED WORK MEASUREMENT

THREE CREDIT HOURS

An advanced study of work standards, how they are developed, evaluated and used. Predetermined time systems, time study techniques and Work Measurement Sampling are studies with particular emphasis on the statistical aspects of work measurement.

INE 508. ADVANCED QUALITY CONTROL

THREE CREDIT HOURS

Principles and applications of the latest quality control procedures. Design of quality control systems and procedures. Recent developments in statistical quality control such as multi-level continuous acceptance sampling, variable sampling, and life testing.

INE 509. THE ENGINEERING OF MANAGEMENT

THREE CREDIT HOURS

Engineering design of structures of human association. Decision processes, communication and information, implementation and adjustment of dynamic systems, measurement, analysis and synthesis of organizations.

INE 521-522. OPERATIONS RESEARCH

SIX CREDIT HOURS

Study of methods of operations research, including formulating problems, weighing the objectives, construction of models, deriving solutions, testing the models and implementing results. Emphasis upon applications of operations research to industrial problems. Prerequisites: Ine 501, Ine 503, or equivalent.

INE 523. ANALYSIS OF RESPONSE SURFACES AND RELATED TOPICS THREE CREDIT HOURS

A study of various strategies and associated statistical analyses related to experimental determination of an optimum and the mapping of the "responsible surface" in the neighborhood of the optimum when the dependent variable is subject to errors. Prerequisite: Ine 521, or equivalent.

INE 525. SYSTEM RELIABILITY AND MAINTAINABILITY **THREE CREDIT HOURS**

Application probability and statistical theory to the design of reliability systems in the broadest sense; theory behind and techniques to be used in designing evaluation methods and procedures for determining reliability of component parts and total systems. Prerequisite: Ine 521, or equivalent.

INE 528. DESIGN AND ANALYSIS OF EXPERIMENTS **THREE CREDIT HOURS**

Covers advanced topics in statistical experiments with emphasis on the design aspects. Topics include confounding, fractional replication, factorial and nested designs. Prerequisite: Ine 501, or equivalent.

INE 541. PRODUCTION ENGINEERING **THREE CREDIT HOURS**

The design of systems of men and machines for the production process; forecasting, scheduling, production and inventory control, staffing, plant layout, and equipment replacement. Prerequisites: Ine 502, 521, or equivalent.

INE 542. ANALYSIS AND DESIGN OF CONTROL SYSTEMS **THREE CREDIT HOURS**

Use of mathematical models, data-gatherings and statistics in defining the design problem. Systems logic, queuing theory, game theory, linear programming, simulation and human engineering applied to the design of large-scale work systems. Prerequisites: Ine 502, 521, or equivalent.

INE 543. ADVANCED PRODUCTION CONTROL **THREE CREDIT HOURS**

Analysis of modern, quantitative techniques of production planning and control. Design of production control systems using methods of mathematical programming, probabilistic and deterministic models. Prerequisites: Ine 521, 522, or equivalent.

INE 544. ADVANCED TOPICS IN RELIABILITY AND MAINTAINABILITY **THREE CREDIT HOURS**

The exact content of this course will vary from year to year. The major emphasis will be to study the latest research in the field and evaluate the impact these developments will have on future practices in reliability and maintainability. Prerequisites: Ine 509, 525, or equivalent.

INE 598. SPECIAL PROBLEMS IN INDUSTRIAL ENGINEERING **TWO TO SIX CREDIT HOURS**

Particular assignments to be arranged and approved by the chairman of the student's advisory committee.

INE 599. MS THESIS IN INDUSTRIAL ENGINEERING **NINE CREDIT HOURS**

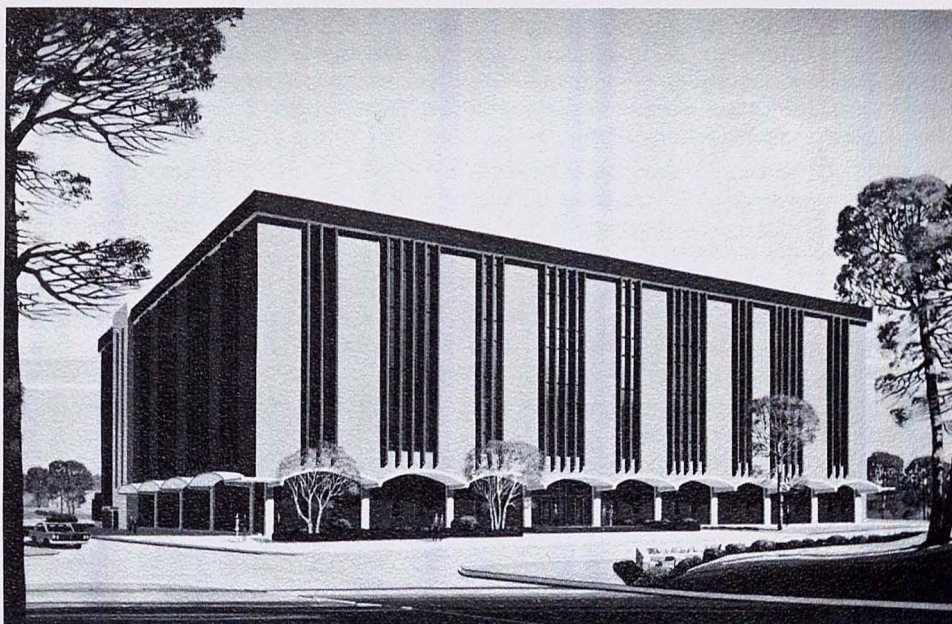
Students engaged in Master's thesis research must register for this course and continue registering each semester until the thesis is completed for a total credit of not more than nine hours (usually six hours).

Mechanical Engineering (MEE)Howard E. Smith, *Chairman*

Students who have completed work equivalent in nature to the stated prerequisite courses may be enrolled in these courses with the consent of the instructor.

MEE 501. PHYSICAL METALLURGY I (Structure) **THREE CREDIT HOURS**

The electronic, atomic, submicroscopic, microscopic and macroscopic structures of crystalline solids are presented. Specific topics include bonding, electron theory of metals, crystallography, atomic arrangements, imperfections in crystals, dislocations, phase diagrams, phase transformations, and diffusion. Prerequisite: Mth 219.



MEE 502. PHYSICAL METALLURGY II (Mechanical Properties) THREE CREDIT HOURS
 A theoretical approach to the mechanical behavior of crystalline solids is presented, emphasizing the relationship of mechanical properties to the structure of materials. Topics include elasticity, plasticity, strengthening mechanisms, creep, fracture, fatigue, and the mechanical testing of these properties. Prerequisite: Mee 501.

***MEE 511. CLASSICAL THERMODYNAMICS THREE CREDIT HOURS**
 Equilibrium, first law, second law, state principle, and zeroth law; development of entropy and temperature from availability concepts; chemical potential, chemical equilibrium, and phase equilibrium. Thermodynamics of irreversible processes; Onsager reciprocal relations; application of these concepts to diffusion, electronic phenomena in solids, direct energy conversion, and biological problems.

***MEE 512. CONDUCTION HEAT TRANSFER THREE CREDIT HOURS**
 Steady state and transient state conduction. Evaluation of temperature fields by formal mathematics, numerical analysis, and analogic experiments.

***MEE 513. JET PROPULSION THREE CREDIT HOURS**
 Principles of jet propulsion and engine classification, aerothermodynamics, diffuser and nozzle flow, energy transfer in turbo-machinery, turbojet and turbo-fan engines, turbo-prop and turboshaft engines, rocket motors and brief introduction to related materials. Prerequisite: Mee 418.

*Open for enrollment of undergraduate student with the consent of the department chairman.

MEE 514. DIRECT ENERGY CONVERSION**THREE CREDIT HOURS**

Introduction to the principles of direct energy conversion. The following topics are discussed: irreversible thermodynamics; semiconductors; thermoelectric, thermomagnetic, photovoltaic, and thermionic devices; magnetohydrodynamics; fuel cells. Prerequisites: Mee 303 and Mee 511.

MEE 515. STATISTICAL THERMODYNAMICS*THREE CREDIT HOURS**

Microscopic thermodynamics; Kinetic theory; Virial theorem of Clausius; transport phenomena; Gibbs, Boltzmann, Bose-Einstein, Fermi-Dirac Statistics. Connection between statistical and thermodynamic quantities. Applications to Perfect and Real gases, liquids, crystalline solids, and thermal radiation. Information theory, irreversible thermodynamics. Prerequisites: Mee 301, Mth 219.

MEE 516. CONVECTION HEAT AND MASS TRANSFER*THREE CREDIT HOURS**

Development of governing differential equations for convection. Methods of solution including similarity methods, integral methods, superposition of solutions, eigenvalue problems. Turbulent flow convection; integral methods, eddy diffusivities for heat and momentum. Extensions to mass transfer. Prerequisite: Mee 410.

MEE 517. RADIATION HEAT TRANSFER**THREE CREDIT HOURS**

Fundamental relationships of radiation heat transfer. Radiation characteristics of surfaces. Geometric considerations in radiation exchange between surfaces. Emissivity and absorptivity of gases. Introduction to radiative exchange in gases. Prerequisite: Mth 403.

MEE 521. VISCOUS FLOW**THREE CREDIT HOURS**

Fundamentals of viscous flow. Navier-Stokes and boundary layer equations. Exact and approximate solutions of these equations. Thermal boundary layers and boundary layers in compressible flow. Prerequisite: Mee 418; Corequisite: Mth 403.

MEE 522. POTENTIAL FLOW**THREE CREDIT HOURS**

Fundamental equations, kinematics and dynamics of fluid flow. Principles of irrotational flow. Conformal representation of two-dimensional flow. Prerequisite: Mee 308; Corequisite: Mth 404.

MEE 523. COMPRESSIBLE FLOW*THREE CREDIT HOURS**

Fundamental equations of compressible flow, introduction to flow in two and three dimensions. Two-dimensional supersonic flow, small perturbation theory, method of characteristics, oblique shock theory. Introduction to unsteady one dimensional motion and shock tube theory. Prerequisite: Mee 418.

MEE 524. MAGNETOHYDRODYNAMICS**THREE CREDIT HOURS**

An introduction to the dynamics of electrically conducting fluids. Fundamental concepts of electromagnetic and fluid fields from macroscopic point of view. Channel flows, boundary layers. Magnetohydrodynamic propulsion and power generation. Brief introduction to kinetic theory of plasmas. Prerequisites: Mee 523, Mth 403.

MEE 531. KINEMATIC SYNTHESIS OF MECHANISMS*THREE CREDIT HOURS**

Synthetic design of mechanisms generating a predetermined motion. Introduction to spatial mechanisms.

*Open for enrollment of undergraduate student with the consent of the department chairman.

***MEE 533. STRUCTURAL ANALYSIS I** **THREE CREDIT HOURS**
 Basic principles of stress and strain, introduction to Theory of Elasticity, Theory of Beams, and Elastic Instability. Prerequisites: Egm 303, Mth 219.

***MEE 534. STRUCTURAL ANALYSIS II** **THREE CREDIT HOURS**
 The Torsion Problem, Stable Plates and Shells, Applications to Axially Symmetrical Problems, and discussions of Viscous and Plastic Behavior of Materials. Prerequisite: Egm 304.

***MEE 535. MECHANICAL VIBRATIONS** **THREE CREDIT HOURS**
 Multi-degree of freedom systems, Lagrange's equations, transient vibrations, vibrations of continuous systems. Matrix and numerical methods. Introduction to finite element method. Introduction to nonlinear vibrations. Prerequisite: Mee 416.

***MEE 536. AUTOMATIC PROCESS CONTROL** **THREE CREDIT HOURS**
 Study of automatic control with particular emphasis on process control (hydraulic, pneumatic and mechanical systems), stability analysis, introduction to the numerical control of machine tools.

MEE 550. MECHANICAL ENGINEERING PROJECT **SIX CREDIT HOURS**
 Student participation in a departmental research, design, or development project under the direction of a project advisor. To obtain credit, the student must show satisfactory progress in the project as determined by a committee presided over by the project advisor and must present a written report and a seminar to the faculty of the Mechanical Engineering Department and other interested persons.

MEE 598. SPECIAL PROBLEMS IN MECHANICAL ENGINEERING **SIX CREDIT HOURS**
 Special assignments in Mechanical Engineering subject matter to be arranged and approved by the student's Faculty Advisor and the Department Chairman.

*Open for undergraduate enrollment with the consent of the Department Chairman.

English (ENG)

Dr. B. J. Bedard, *Chairman*

Any 400 level undergraduate course in English may yield graduate credit under the conditions described in the degree requirements. Prerequisite for enrolling in any of the following courses for graduate credit is at least twenty-four semester hours in literature. All 500 level courses meet for two hours but yield three hours credit. The starred courses can be repeated for graduate credit when the topic or content changes.

***ENG 505. CREATIVE WRITING** **THREE CREDIT HOURS**
 Supervised practice in writing in various literary forms. Conducted both by group discussions and by individual conferences and critiques. Permission of Chairman required.

ENG 511. MIDDLE ENGLISH **THREE CREDIT HOURS**
 A study of the developments in the English language from 1066 to 1500 with an ancillary treatment of representative literary specimens.

***ENG 514. STUDIES IN MEDIEVAL LITERATURE** **THREE CREDIT HOURS**
 A treatment of the principal forms and movements in the literature of the Middle Ages, usually read in translation.

- ENG 516. CHAUCER I THREE CREDIT HOURS
An intensive analysis of *The Canterbury Tales*.
- ENG 517. CHAUCER II THREE CREDIT HOURS
A study of *Troilus and Criseyde* and the minor poems of Chaucer. Eng 516 is *not* a prerequisite.
- *ENG 522. STUDIES IN SIXTEENTH CENTURY LITERATURE THREE CREDIT HOURS
A treatment of the non-dramatic literature of the English Renaissance.
- ENG 526. SHAKESPEARE I THREE CREDIT HOURS
A consideration of the development of Shakespeare's art from the beginning to *Twelfth Night*. The course includes the early comedies and tragedies, the histories, and the romantic comedies.
- ENG 527. SHAKESPEARE II THREE CREDIT HOURS
An analysis of Shakespeare's development from *Hamlet* to *The Tempest*. The course includes the major tragedies, problem plays, and dramatic romances. Eng 526 is *not* a prerequisite.
- *ENG 532. STUDIES IN SEVENTEENTH CENTURY LITERATURE THREE CREDIT HOURS
A consideration of the principal poets and prose writers of the Stuart, Commonwealth, or Restoration Periods.
- *ENG 536. STUDIES IN DRAMA TO 1642 THREE CREDIT HOURS
A survey of English drama from the beginning to the closing of the theatres.
- *ENG 538. STUDIES IN MILTON THREE CREDIT HOURS
A treatment of the major and minor poems and related prose of Milton.
- *ENG 542. STUDIES IN EIGHTEENTH CENTURY LITERATURE THREE CREDIT HOURS
A study of the writers of the Augustan, Post-Augustan, and Pre-Romantic Ages.
- *ENG 546. STUDIES IN THE NOVEL THREE CREDIT HOURS
A consideration of the development and characteristic forms of the novel.
- *ENG 552. STUDIES IN ROMANTICISM THREE CREDIT HOURS
The nature and progress of English Romanticism as revealed in the principal poets of the early part of the Nineteenth Century.
- *ENG 556. STUDIES IN NINETEENTH CENTURY LITERATURE THREE CREDIT HOURS
A treatment of the significant poets and essayists of the Victorian Age.
- *ENG 562. STUDIES IN TWENTIETH CENTURY LITERATURE THREE CREDIT HOURS
A study of significant movements, forms, and writers in the literature of the Twentieth Century.
- *ENG 566. STUDIES IN DRAMA SINCE 1660 THREE CREDIT HOURS
A selective study of significant developments in drama from the Restoration to the present.
- ENG 572. TRANSCENDENTALISM IN NINETEENTH CENTURY AMERICAN LITERATURE THREE CREDIT HOURS
A consideration of the writers of the Romantic Age in America.

*ENG 576. MAJOR AMERICAN WRITERS THREE CREDIT HOURS
An intensive comparative study of two or three American writers considered in depth.

*ENG 582. STUDIES IN AMERICAN LITERATURE SINCE THE CIVIL WAR THREE CREDIT HOURS
A consideration of the principal movements in poetry, fiction, or drama of the late Nineteenth or Twentieth Century.

*ENG 590. TEACHING OF COLLEGE ENGLISH ONE CREDIT HOUR
Discussion, instruction, and practice in the methods of teaching composition and literature. Required of and open only to Assistants.

ENG 592. PHILOSOPHICAL AND CRITICAL FOUNDATIONS OF LITERATURE THREE CREDIT HOURS
An intensive treatment of the philosophical assumptions underlying the influential literary theories from antiquity to the present. Required of all degree applicants.

ENG 595. RESEARCH AND BIBLIOGRAPHY THREE CREDIT HOURS
An introduction to the methods and tools of literary scholarship. Required of all degree applicants.

ENG 599. THESIS THREE-SIX CREDIT HOURS

History (HST)

Dr. Winfred J. Steiner, *Chairman*

Any 300-400 upper level undergraduate course in History may be taken for graduate credit under the usual conditions.

HST 500. HISTORIOGRAPHY THREE CREDIT HOURS
The course will concentrate on a study of the principal historians and the chief contributions to the development of historical writing. Some familiarity with historical method will be required in the composition of research papers.

HST 503. MODERN NILOTIC AFRICA THREE CREDIT HOURS
Focus on the interrelated history of the countries of the Nile—Ethiopia, Uganda, the Sudan, and Egypt—in the 19th and 20th centuries. Emphasis also on the area's impact on the world.

HST 506. MEDIEVAL CIVILIZATION THREE CREDIT HOURS
An interpretation of the culture of the Middle Ages, including Christian thought from St. Augustine to St. Thomas Aquinas, humanism and the classical revival, the rise of vernacular literature, the fine arts, education, and scientific development. A general knowledge of medieval history is presupposed.

HST 512. STUDIES IN EARLY EUROPEAN HISTORY THREE CREDIT HOURS
Selected developments in government, law, urban life, and learning from Rome's decline to the 15th century. Byzantine and Islamic contributions are included.

HST 517. MODERN EUROPEAN NATIONALISM THREE CREDIT HOURS
The course will present the meaning, promoters, characteristics, and development of continental nationalism from the eighteenth century to the present time.

HST 521. TUDOR-STUART ENGLAND**THREE CREDIT HOURS**

A study of England—1485 to 1714. For the Tudor period, chief emphasis will be given to the development of the national state, royal absolutism, and the Reformation. The evolution of the constitutional question will be the main theme in the treatment of the Stuart era and Cromwellian Interregnum. The social, economic and cultural aspects of the period, as well as its diplomacy, will be fully covered.

HST 522. VICTORIAN ENGLAND**THREE CREDIT HOURS**

The study of Great Britain from the Congress of Vienna in 1815 to the end of World War I. The course examines domestic politics, imperial affairs, the Oxford and Evangelical Movements, the Industrial Revolution, the development of Socialism, and major intellectual and cultural currents.

HST 523. BRITAIN IN THE ERA OF GEORGE III**THREE CREDIT HOURS**

A survey of the changes in British political, social and economic institutions. The neo-classical and Romantic movements, Wesleyism, and the beginnings of Evangelicalism will be studied.

HST 525. 20TH CENTURY BRITAIN**THREE CREDIT HOURS**

A study of the principal political, social, economic, and intellectual trends since 1900. Emphasis will be placed on Britain's changing role in world affairs and on the development of the welfare state.

HST 535. HISTORY OF CHINA'S TRADITIONS**THREE CREDIT HOURS**

A survey of the genesis and development of the Sinitic Civilization and its relationships to Indian, Islamic, and Western civilizations from the earliest beginnings to the 19th century.

HST 539. JAPAN SINCE PERRY**THREE CREDIT HOURS**

A historical study of the economic, social, and political developments of modern Japan from the end of the "Seclusion" to the present time.

HST 540. INTERPRETATIONS IN WORLD HISTORY**THREE CREDIT HOURS**

Specific topics will be chosen for investigation and interpretation as determined by the instructor. The course will be designed to assist students in following recent trends in the interpretation of historical events. A general knowledge of World History is a prerequisite.

HST 541. THE HAPSBURG EMPIRE**THREE CREDIT HOURS**

A study of the Empire from pre-16th century origins to 1918, including such topics as Charles V; Ottoman rivalries; Maria Theresa; Joseph II; Metternich; Eastern Question; and the Dual Monarchy.

HST 542. THE BALKANS SINCE 1453**THREE CREDIT HOURS**

The course covers the historical evolution of the Balkan area (Hungary, Rumania, Yugoslavia, Albania, Bulgaria and Greece) within the framework of Byzantine, Hapsburg and Ottoman influence. Emphasis will be on 19th and 20th centuries.

HST 544. CONTEMPORARY MIDDLE EAST**THREE CREDIT HOURS**

A study of Iran, Iraq, Turkey, Afghanistan, Syria, Lebanon, Israel, Egypt, Saudi-Arabia and Yemen since World War II. Stress is placed on institutional histories and recent developments.

HST 545. SEMINAR IN NON-AMERICAN HISTORY THREE CREDIT HOURS
Discussions and reports. The topics will depend, in part, upon the interest of the members of the class.

HST 550. THE PHILOSOPHY OF HISTORY THREE CREDIT HOURS
After surveying the various metaphysical interpretations of the meaning of history, the course then analyzes the literature concerned with the epistemological problems of writing history.

HST 552. THE AMERICAN REVOLUTION THREE CREDIT HOURS
The course will treat the following topics: the problems of empire-relationships since 1754; the causes, conduct, and consequences of the American Revolution; the postwar problems leading to the adoption of the Federal Constitution.

HST 557. AGE OF YOUNG AMERICA (1840-1860) THREE CREDIT HOURS
A detailed study of the major political, economic, intellectual, and social developments of the period. Emphasis on the various expansionist movements and failures of the sectional compromises.

HST 570. THE OLD SOUTH THREE CREDIT HOURS
A study of political, social, economic, and cultural history, emphasizing presiding themes of pre-Civil War Southern life—ruralism, cotton culture, extractive economics, slavery, developing political minority status in the nation. A general knowledge of American History is a prerequisite.

HST 571. THE POPULIST REVOLT THREE CREDIT HOURS
An intensive study of political, social, and economic developments during the administrations of Cleveland, Harrison, and McKinley.

HST 572. THE NEW SOUTH THREE CREDIT HOURS
A study and appraisal of the internal and external forces that have shaped the Southern states since the Civil War. All aspects of Southern life will be considered.

HST 579. HISTORY OF NORTH AMERICAN RELATIONSHIPS THREE CREDIT HOURS
This course emphasizes an interpretation of the political, diplomatic, economic, and military relationships of the United States, Canada, and Mexico from the colonial era to the present.

HST 581. LATIN AMERICA, 1760-1860 THREE CREDIT HOURS
A study of the phases of revolutionary transition: the colonial heritage, the Enlightenment, imperial reforms, dissolution of the Iberian empires, and the emergence of new states.

HST 585. SCIENCE AND TECHNOLOGY IN AMERICAN HISTORY THREE CREDIT HOURS
A descriptive and interpretative study of the role of American scientists, inventors, and technologists in American history from the colonial era to the present time, with particular emphasis upon the Machine Age. A general knowledge of American History is a prerequisite.

HST 590. INTERPRETATIONS IN AMERICAN HISTORY THREE CREDIT HOURS
Specific topics will be chosen for investigation and interpretation as determined by the instructor. The objective of the course is to study new interpretations of historical events. A general knowledge of American History is a prerequisite.

HST 593. U.S. POLICY IN THE FAR EAST THREE CREDIT HOURS
 An objective study and thorough analysis of United States-Far Eastern relations with special emphasis on the evolution of American policy in the Far East since 1900.

HST 595. SEMINAR IN AMERICAN HISTORY THREE CREDIT HOURS
 Students will examine selected topics in American History. A research paper will be required of each student.

HST 599. THESIS THREE-SIX CREDIT HOURS

Information Science (ISC)

Dr. Anthony Debons, *Chairman*

ISC 501. INTRODUCTION TO INFORMATION SCIENCE THREE CREDIT HOURS
 Overview of the psychological and scientific principles that underly information. Emphasis is on explaining the foundations of information processing and communication concepts relating such foundations to the development of information systems. Required of all students in program during first year.

ISC 503. INTRODUCTION TO CYBERNETICS THREE CREDIT HOURS
 This course involves the study of the theories of information processing in complex systems. It discusses aspects of cybernetics, fundamentals of feedback control theory, self-adaptive systems, biological control system, and other related areas. Prerequisite: ISC 501.

ISC 510. COMPUTERS AND RESEARCH DESIGN THREE CREDIT HOURS
 An introduction to computer technology with emphasis on the use of computers in facilitating experimentation in both the physical and social sciences. The course concerns both the hardware and software aspects of computers and the coupling of such knowledge with scientific methodology. Students are required to include 510L.

ISC 510L. COMPUTERS AND RESEARCH DESIGN LAB ONE CREDIT HOUR
 Students are expected to design an experiment in their particular field of interest, write a computer program, and process the data through the computer for analysis and the determination of experimental conclusions.

ISC 515. MATHEMATICS AND INFORMATION SCIENCE THREE CREDIT HOURS
 Introduction to those mathematical areas needed by the information scientist for the theoretical analysis of information handling problems and the design of system models.

ISC 516. ADVANCED STATISTICAL APPLICATION TO INFORMATION SCIENCE THREE CREDIT HOURS
 Extend statistical analytical concepts to those normally encountered in the information science literature. Prerequisite: Six hours in Statistics either at the graduate or undergraduate level. ISC 515.

ISC 520. COMMUNICATION THEORY THREE CREDIT HOURS
 Introduction to the principles of communication in general and to the concepts of communication and information theory in particular. Prerequisite: ISC 501.

ISc 525. FOUNDATIONS OF BEHAVIORAL THEORY **THREE CREDIT HOURS**

This course is intended for the student with less than nine hours in psychology. The material studied is highly condensed to bring into perspective the more important of the available psychological data and theory. Primarily oriented for the student who has majored in physical science or engineering. Required of all students admitted with less than nine undergraduate credit hours in psychology.

ISc 550. INFORMATION SYSTEM TECHNOLOGY **THREE CREDIT HOURS**

Survey of the technology used in information systems. Consideration will be given to technological needs for specialized information environments such as medicine, industry evaluating information presentation technologies. Prerequisite: ISc 501.

ISc 553. INFORMATION PRESENTATION **THREE CREDIT HOURS**

Various methods of presenting data are surveyed and studied. Mechanical and electronic methods of presenting information are considered in detail. Basic psychological data on the visual, auditory sensory systems are studied to provide the student with the basis of evaluating information presentation technologies. Prerequisite: ISc 501.

ISc 560. ORGANIZATION AND RETRIEVAL OF INFORMATION **THREE CREDIT HOURS**

Basics of information storage and retrieval in library, management, and scientific environments are studied. Stress is placed on prevailing research findings on psychological problems of information availability and utilization. Emphasis is on the study of organization and retrieval theory rather than on the related mechanics. Prerequisite: ISc 501.

ISc 561. DESIGN OF MANAGEMENT INFORMATION DECISION SYSTEMS**THREE CREDIT HOURS**

To formulate design principles based upon a review of some of the critical issues discussed in the literature and upon the synthesis of ideas formulated in open class discussion of the literature and a series of exemplary design problems.

ISc 565. SOCIOLOGY OF INFORMATION SYSTEMS **THREE CREDIT HOURS**

An assessment of the philosophical foundations of information and the ethical, moral, political, and social implications of the development of large, complex data processing systems. Prerequisite: ISc 501.

ISc 570. HUMAN COMMUNICATION **THREE CREDIT HOURS**

Introduction to the sciences related to human communication: psychoacoustics, linguistics, and semantics. Emphasis is on the study of speech production and perception, and the development, structure and use of natural language. Prerequisite: ISc 520.

ISc 571. MAN-MACHINE COMMUNICATION **THREE CREDIT HOURS**

Introduction to man-machine communication problems. Emphasis is on methods and techniques which permit communication between man and machine by human forms of natural languages: character recognition, speech recognition, and speech synthesis by machine. Prerequisite: ISc 570.

ISc 575. ARTIFICIAL INTELLIGENCE **THREE CREDIT HOURS**

A study of computer models of concept learning, pattern recognition, problem solving, human rote memory, adaptive systems, simulations of individuals belief systems, neuroticism, and the psychotherapeutic communication process.

ISc 576. COMPUTATIONAL LINGUISTICS THREE CREDIT HOURS
 A study of computer models of sentence and text understanding, computer question answering systems, and natural language processing by computer. Prerequisite: ISc 575.

ISc 580. HUMAN INFORMATION PROCESSING THREE CREDIT HOURS
 Intended as an advanced course in behavioral theory for students possessing at least nine hours in psychology. The course applies contemporary notions in learning, perception, decision making to the developments in Information Science. Prerequisite: ISc 525, for students with less than nine hours Psychology.

ISc 590. GRADUATE SEMINAR ONE CREDIT HOUR
 Enable the student to be familiar with the interest of other graduate students in the program; listen to lectures from the graduate students on research proposals, thesis, etc. Attend lectures of distinguished individuals in the field. Required of all students during Fall and Spring semesters.

ISc 596. PRACTICUM IN THE DEVELOPMENT OF INFORMATION SYSTEMS THREE CREDIT HOURS
 Provide experience to the student in working with information problems. Students are assigned to other departments and activities of the university of specific projects. Prerequisite: Permission of advisor.

ISc 597. READINGS ONE TO THREE CREDIT HOURS
 Allow individuals interested in specific areas of information to read intensively on the subject with the general guidance of his advisor.

ISc 598. SPECIAL PROBLEMS ONE TO THREE CREDIT HOURS
 Areas in Information Science of particular interest to the student are pursued. Where dictated individual research is initiated. Permission of advisor.

Mathematics (MTH)

Dr. Kenneth C. Schraut, *Chairman*

The following courses may be taken by individuals outside the Mathematics Program for completion of requirements for their Master's degree.

MTH 403. APPLIED ANALYSES I THREE CREDIT HOURS
 Prerequisite: Mth 218 or 228.

MTH 404. APPLIED ANALYSES II THREE CREDIT HOURS
 Prerequisite: Mth 403.

MTH 411. PROBABILITY AND STATISTICS I THREE CREDIT HOURS
 Prerequisite: Mth 218 or 228.

MTH 412. PROBABILITY AND STATISTICS II THREE CREDIT HOURS
 Prerequisite: Mth 411.

MTH 413. PROBABILITY AND STATISTICS III THREE CREDIT HOURS
 Prerequisite: Mth 412.

MTH 421. ADVANCED CALCULUS I THREE CREDIT HOURS
 Prerequisite: Mth 218 or 228.

MTH 422. ADVANCED CALCULUS II THREE CREDIT HOURS
 Prerequisite: Mth 421.

MTH 461. INTRODUCTION TO THE THEORY OF FUNCTIONS OF A COMPLEX VARIABLE

Prerequisite: Mth 422.

THREE CREDIT HOURS

MTH 471. TOPOLOGY

Prerequisite: Mth 422.

THREE CREDIT HOURS

NOTE: Only Mth 411, 412 and 413 may be applied to the Master's degree in Mathematics. The description of all these courses may be found in the undergraduate catalog.

Master of Science in Education degree with a concentration in Mathematics

Students following the Master High School Teacher Program in the School of Education who desire a concentration in mathematics should take the courses listed below. Normally, these courses, which satisfy all the recommendations of the M.A.A. and N.C.T.M. for teacher training in high school mathematics, are taught only in the Summer Session as part of an N.S.F. Institute program. For a more detailed description of the Master High School Teacher program leading to the Master of Science in Education degree, see pages 56 and 59 of this catalog.

MTH 501-502. FUNDAMENTAL CONCEPTS OF ALGEBRA

THREE CREDIT HOURS EACH TERM

An introduction to the basic concepts of abstract algebra such as number postulates, groups, rings, fields, mappings, classes, and sets, as well as certain concepts taken from the classical theory of equations. An intensive study of the relation of these topics to the topics of high school algebra as proposed by several curriculum revision groups.

MTH 503-504. FUNDAMENTAL CONCEPTS OF GEOMETRY

THREE CREDIT HOURS EACH TERM

A study of the axioms and concepts upon which various geometries are built. A comparison is made between Euclidian, metric and projective geometries and to a lesser extent consideration is given to non-Euclidian geometries. A comparison is also made between synthetic and analytic methods of proof with some consideration given to vector notation. An intensive study of the relation of these topics to the topics of high school geometry as proposed by several curriculum revision groups.

MTH 505-506. FUNDAMENTAL CONCEPTS OF PROBABILITY AND STATISTICS

THREE CREDIT HOURS EACH TERM

Topics to be discussed include: the basic laws of probability, frequency distributions (Binomial, Poisson, Normal, etc.), sampling estimation of parameters, sampling distributions, confidence intervals, tests of hypotheses, regression, and analysis of variance. An intensive study of the relation of these topics to the topics of high school probability and statistics as proposed by several curriculum revision groups.

MTH 507-508. FUNDAMENTAL CONCEPTS OF ANALYSIS

THREE CREDIT HOURS EACH TERM

This course will include the concepts of number, sequence, function of a single real variable and function of several real variables, limit, continuity, total derivative and partial derivative, single integral and multiple integral, infinite series, and applications to geometry, as well as their relation to the material in the high school curriculum.

The Master's degree in Mathematics

See page 32 of this catalog for a description of the requirements for this degree.

MTH 511-512. STATISTICAL INFERENCE

THREE CREDIT HOURS EACH TERM

Distribution theory including conditional distributions, order statistics, sufficient statistics, the Rao-Blackwell theorem, point and interval estimation, maximum likelihood estimation, hypothesis testing, likelihood ratio tests, Chebyshev's inequality, central limit theorem.

MTH 521-522. REAL VARIABLES

THREE CREDIT HOURS EACH TERM

A brief discussion of some of the elementary notions of set theory, functions, cardinality, order types and ordinals; the topology of the real line, continuity, the Stone-Weierstrass theorem, Lebesgue measure, measurable functions, Lebesgue integration; differentiation and integration, absolute continuity; the classical Banach spaces, product measures and Fubini's theorem; extensions of the Lebesgue integral.

MTH 523-524. MEASURE THEORY AND INTEGRATION

THREE CREDIT HOURS EACH TERM

Abstract measure theory; extensions and completions of measures; integration; general set functions; signed measures; Jordan-Hahn decompositions: the Radon-Nikodym theorem and applications; integration over locally compact spaces; regularity; the Riesz-Markoff theorem; integration over locally compact groups. Prerequisites: Mth 521-522 and Mth 471 or 571.

MTH 525-526. COMPLEX VARIABLES

THREE CREDIT HOURS EACH TERM

Fundamental concepts, integral theorems, series and the expansion of analytic functions in series, singularities, entire functions; meromorphic functions; analytic continuation; conformal representation. Prerequisite: Mth 422.

MTH 531-532. ADVANCED DIFFERENTIAL EQUATIONS

THREE CREDIT HOURS EACH TERM

Existence theorems and numerical methods; linear equations and systems; singularities; asymptotic behavior and stability; self adjoint differential systems and boundary value problems. Prerequisite: Mth 521.

MTH 535-536. PARTIAL DIFFERENTIAL EQUATIONS

THREE CREDIT HOURS EACH TERM

Classification of partial differential equations, reduction to canonical form; existence theorems and the generalized Cauchy problem; methods of solution, orthogonal functions, Green's Theorem, and operational methods; the wave equation, Laplace's equation, some problems in the conduction of heat, motion of viscous fluids, the hodograph methods; numerical solutions and existence theorems related to these methods. Prerequisites: Mth 421 and 461.

MTH 545. SPECIAL FUNCTIONS

THREE CREDIT HOURS

The special functions frequently encountered in engineering and the physical sciences are studied. The hypergeometric function and generating functions are used throughout to develop the theory. The theories of infinite products and asymptotic expansions are also discussed. Prerequisites: Mth 422 and 461.

MTH 551-552. METHODS OF MATHEMATICAL PHYSICS

THREE CREDIT HOURS EACH TERM

Linear transformations and matrix theory; the series expansion of functions; linear integral equations; the calculus of variations; linear and non-linear oscillators; eigenvalue problems; partial differential equations and potential theory; functional transformations; special functions. Prerequisite: Consent of instructor.

MTH 555-556. ADVANCED NUMERICAL ANALYSIS THREE CREDIT HOURS EACH TERM
 Quadrature methods and the numerical solution of ordinary differential equations; matrices and large scale linear systems; norms and spectral radii of matrices; modern iterative matrix methods, including the successive overrelaxation method; numerical solution of partial differential equations. Considerations will be given to methods suitable for use on digital computers. Prerequisite: Consent of instructor.

MTH 561-562. MODERN ALGEBRA THREE CREDIT HOURS EACH TERM
 Semi-groups, rings, integral domains and fields; extensions of rings and fields, elementary factorization theory, groups with operators; modules and ideals; finite and infinite field extensions; fields with valuations, real fields and Galois Theory.

MTH 565-566. LINEAR ALGEBRA THREE CREDIT HOURS EACH TERM
 Vector spaces, linear transformations and matrices; determinants, invariant direct-sum decomposition, rational and Jordan canonical forms; inner product spaces, the spectral theorem, bilinear and quadratic forms. Prerequisite: Mth 361 or equivalent.

MTH 571-572. TOPOLOGY THREE CREDIT HOURS EACH TERM
 An axiomatic treatment of the concept of a topological space; various operators on a set which define a topology; bases and subbases; connectedness, compactness; continuity, homeomorphisms, separation properties and countability axioms; regular and normed spaces, filters, function and quotient spaces; metrizable, paracompactness. Uniform spaces.

MTH 573-574. NORMED LINEAR SPACES THREE CREDIT HOURS EACH TERM
 The study of various topologies within linear spaces, with emphasis on Banach and Hilbert Spaces; review of Lebesgue integration; orthogonal expansions; projections, linear transformation, Banach algebras and spectral theory.

MTH 575. DIFFERENTIAL GEOMETRY THREE CREDIT HOURS
 Vector and tensor algebra; covariant differentiation. An introduction to the classical theory of curves and surfaces treated by means of vector and tensor analysis.

MTH 581-582. MATHEMATICAL LOGIC THREE CREDIT HOURS EACH TERM
 Propositional calculus, quantification theory, characterization problem for theories, theory of models, recursive functions, undecidability and completeness, arithmetical and analytical hierarchies, formalization of arithmetic. Prerequisite: Mth 481 or equivalent.

MTH 590. TOPICS IN MATHEMATICS THREE CREDIT HOURS EACH TERM
 This course will be given upon appropriate occasions and will deal with specialized material not covered in the regular courses. It may be taken more than once in different areas. Prerequisite: Consent of Chairman.

MTH 591. CONTEMPORARY PHILOSOPHY OF MATHEMATICS THREE CREDIT HOURS
 Cartesian, Humean, Leibnizian, and Kantian doctrines which underlie contemporary philosophy of mathematics; Logicism, Formalism, Intuitionism, and the positions of twentieth-century philosophers of mathematics including Russell, Hilbert, Wittgenstein, and Whitehead. Prerequisite: Mth 481.

MTH 598. THESIS THREE TO SIX CREDIT HOURS

MTH 599. PHILOSOPHICAL FOUNDATIONS OF MATHEMATICS THREE CREDIT HOURS
 Survey of mathematical logic, Goedel's incompleteness theorem; contemporary philosophy of mathematics; the historical interrelation of philosophy and mathematics.

Philosophy (PHL)

Dr. Richard R. Baker, *Chairman*

PHL 500. PLATO AND ARISTOTLE IN ANCIENT PHILOSOPHY THREE CREDIT HOURS
A textual study of the two most prolific and most influential Greek philosophers.

PHL 501. ST. THOMAS AND ST. AUGUSTINE IN MEDIEVAL PHILOSOPHY THREE CREDIT HOURS
A detailed study of the historical development of the Christian philosophical thought as represented by two great personalities of the Patristic and Scholastic periods of the Middle Ages.

PHL 502. DESCARTES AND KANT IN MODERN PHILOSOPHY THREE CREDIT HOURS
A detailed study of the basic concepts of modern philosophy as exemplified in the fundamental doctrine of Descartes and Kant.

PHL 503. PHILOSOPHY OF MAN THREE CREDIT HOURS
A philosophical investigation of man's dignity as discovered through an analysis of his nature, his origin, and his destiny. (Only for those students without sufficient philosophical background for PHL 510.)

PHL 510. PHILOSOPHY OF SCIENCE THREE CREDIT HOURS
An examination of the philosophical problems of the natural, social, and management sciences. Topics include: the aims of inquiry; the objects of scientific study; theories; models; hypotheses; laws; measurements; inferences; predictions; explanations.

PHL 525. THOMISTIC TEXTS AND COMMENTARIES THREE CREDIT HOURS
This course features carefully selected philosophical readings from the writings of Aquinas to be submitted to a critical analysis through the aid of commentaries, including a correlation to the primary Grecian, Neoplatonic, Patristic and Arabic historical sources. A reading knowledge of Latin is desirable.

PHL 540. ARISTOTLE'S *De Anima* AND ST. THOMAS' COMMENTARY THREE CREDIT HOURS
A comparative study relative to problems touching on the philosophy of man, as well as some problematics of human knowledge; but principally contrasting the animistic hylomorphism of Aristotle with the synolistic hylomorphism of Aquinas.

PHL 541. TEXTS OF PLATO THREE CREDIT HOURS
A detailed analysis of prescribed texts of Plato. The texts selected may vary from year to year. This course, therefore, may be repeated for credit when the topics vary.

PHL 542. TEXTS OF ARISTOTLE THREE CREDIT HOURS
A detailed analysis of prescribed texts of Aristotle. The texts selected may vary from year to year. This course, therefore, may be repeated for credit when the topic varies.

PHL 543. TEXTS OF PRESOCRATIC PHILOSOPHERS THREE CREDIT HOURS
An in depth study of the origins of philosophical thought from Hesiod and Thales to Socrates. This course will contrast the mythological and scientific traditions for philosophical development.

PHL 545. MODERN FRENCH PHILOSOPHY THREE CREDIT HOURS
An examination of the leading philosophical movements in France with particular emphasis on the rationalism of Decartes, the spiritualistic realism of Bergson, the positivism of Comte, and the existentialism of contemporary philosophers.

- PHL 550. PHILOSOPHY OF HISTORY THREE CREDIT HOURS
 After surveying the various metaphysical interpretations of the meaning of history, the course then analyzes the literature concerned with the epistemological problems of writing history.
- PHL 553. KANTIANISM I THREE CREDIT HOURS
 A close analysis of Kant's monumental work, the *Critique of Pure Reason*, with emphasis on its metaphysical implications, followed by a brief study of Kantian ethics in the *Foundations of the Metaphysics of Morals*.
- PHL 554. KANTIANISM II THREE CREDIT HOURS
 A study of Kantian ethics through a careful analysis of Kant's *Critique of Practical Reason*, with emphasis on the questions of law, freedom, happiness and God.
- PHL 555. MODERN GERMAN PHILOSOPHY THREE CREDIT HOURS
 A tracing of post-Kantian influences in modern Germanic philosophy through the idealistic developments of Fichte, Schelling and Hegel; stressing their "rationalistic" theological thought, their return to metaphysics and their varying intellectual intuitionisms.
- PHL 560. MODERN BRITISH PHILOSOPHY THREE CREDIT HOURS
 A survey of the 17th and 18th century reactionary and transitional empiricists from Bacon and Hobbes through Locke, Berkeley and Hume. Points of stress include: (1) their psychologico-epistemological approach to experience and fact; (2) their relation to positivism; (3) a critique of ideas, the value of knowledge, the notion of substance, causality and realism.
- PHL 565. AMERICAN PRAGMATISM THREE CREDIT HOURS
 An investigation of Dewey's concept of experience and its roots in the philosophical writings of Peirce and William James.
- PHL 570. EXISTENTIALIST PHILOSOPHY THREE CREDIT HOURS
 A penetrating study of the existentialist movement, its nature and causes, along with a survey of the position of some of the outstanding existentialists, such as Kierkegaard, Sartre, Jaspers, Heidegger, and Marcel.
- PHL 575. CONTEMPORARY PHILOSOPHIES OF EVOLUTION THREE CREDIT HOURS
 A study of the influence of evolutionary thought in Bergson, Pragmatism of James and Dewey, Marxism, contemporary Christian thought, especially that of Teilhard de Chardin.
- PHL 580. CONTEMPORARY NATURALISM AND REALISM THREE CREDIT HOURS
 An expository and critical study of some areas of contemporary currents in philosophical thought: naturalism, principally the American naturalism of John Dewey; the intentionality and axiological qualities of a realistic philosophy; the philosophy of the human personality in its philosophico-Christian dimensions.
- PHL 585. PHENOMENOLOGY THREE CREDIT HOURS
 An analysis of the phenomenological method based primarily on a critical study of Husserl's *Cartesian Meditations*, the fundamental commentary of the founder of phenomenology on his own method.

PHL 590. DIRECTED STUDIES**THREE CREDIT HOURS**

This course is offered to help the graduate student either to fill unavoidable gaps in his previous training or to study in depth a particular problem, philosopher or historical era. It will be given by qualified members of the staff of the Philosophy Department, after recommendation of the Chairman and Director of Graduate Studies in Philosophy.

PHL 591. SEMINAR**THREE CREDIT HOURS**

Discussions and reports. The topics, authors, and/or problems will be chosen by the professor conducting the seminar and the students.

PHL 592. ANALYTIC PHILOSOPHY**THREE CREDIT HOURS**

A survey of the trends of philosophic thought in America and England since 1900 as an introduction to the problems and tenor of analytic philosophy.

PHL 594. SYMBOLIC LOGIC**THREE CREDIT HOURS**

The history of symbolic logic; formalization of language; propositional and predicate calculi; interpretations; logical truth and validity; consistency, completeness and other metatheoretic considerations; systematization of classical syllogistic logic and other topics.

PHL 599. THESIS**THREE-SIX CREDIT HOURS****Physics (PHY)****Dr. Joseph Kepes, *Chairman***

Any 300-400 level course in Physics may be taken for graduate credit under the usual conditions. All such courses must have the approval of the student's faculty advisor.

PHY 505. MODERN PHYSICS FOR ENGINEERS**THREE CREDIT HOURS**

Selected topics in atomic physics, the solid state, and nuclear physics; elementary quantum mechanics and application to the free-particle and the one-electron atom; X-rays, elementary particles, cosmic rays will also be studied to some extent.

PHY 511. CLASSICAL MECHANICS**THREE CREDIT HOURS**

Analytical dynamics; variational techniques; Hamilton's Principle; the Lagrangian, the Hamiltonian, Hamilton-Jacobi and Poisson Bracket formulations of mechanics; Galilean and Lorentz invariance; and relativistic dynamics. Prerequisite: Phy 303-304 or equivalent.

PHY 512. CLASSICAL THEORY OF FIELDS**THREE CREDIT HOURS**

Hamilton's Principle extended to fields; Lagrangian formulation used to obtain conservation laws, symmetry and invariance principles; the Klein-Gordon, Maxwell, and Dirac equations cited as examples of scalar, vector, and spinor fields; interacting fields and radiative solutions. Prerequisite: Phy 511 or consent of Instructor.

PHY 513. ELECTROMAGNETIC THEORY**THREE CREDIT HOURS**

Electrostatic Fields; Poisson's and Laplace's Equations; Green's Theorem; vector and scalar magnetic potential; Maxwell's Equations; electromagnetic waves; dipole radiation; retarded potentials; Lienard-Wiechert Formulation; interference and diffraction, plus other selected topics. Prerequisite: Phy 511.

PHY 515. STATISTICAL MECHANICS**THREE CREDIT HOURS**

Basic assumptions; statistics of independent particles; the Maxwell Boltzman Distribution; Fermi-Dirac, Bose-Einstein Statistics; applications of distribution laws.

**PHY 517. QUANTUM MECHANICS****THREE CREDIT HOURS**

The Schroedinger Wave Equation; matrix mechanics, operators; perturbation theory; approximation methods and scattering theory. Prerequisite: Phy 511.

PHY 520. ADVANCED SOLID STATE PHYSICS**THREE CREDIT HOURS**

Crystal structure, thermal properties of solids; insulators; band theory of solids; semiconductors; luminescence. Prerequisite: Phy 517 or consent of instructor.

PHY 521. ADVANCED NUCLEAR PHYSICS**THREE CREDIT HOURS**

Basic properties of the nucleus; the deuteron; nuclear binding energies; scattering; nuclear forces; high energy particles. Prerequisite: Phy 517 or consent of instructor.

PHY 523. ADVANCED ELECTRICITY AND MAGNETISM I**THREE CREDIT HOURS**

The boundary value problems of electrostatics and magnetostatics in material media; conservation laws; existence and nature of electromagnetic radiation derived from Maxwell's equations; wave guides and Resonant Cavities.

PHY 524. ADVANCED ELECTRICITY AND MAGNETISM II**THREE CREDIT HOURS**

Radiating Systems, interference, and diffraction; special applications of electromagnetic theory made to plasmas, charged particle collisions, Cherenkov radiation, Bremsstrahlung, and multipole fields. Prerequisite: Phy 523.

PHY 525. QUANTUM MECHANICS I**THREE CREDIT HOURS**

The physical basis of quantum mechanics, wave packets, free particle motion; Schrodinger's equation applied to potential problems; Harmonic Oscillator and the hydrogen atom; three dimensional extrapolation and scattering. Prerequisite: Phy 511.

PHY 526. QUANTUM MECHANICS II**THREE CREDIT HOURS**

Linear vector spaces and spin; time dependent and time independent perturbation theory; the formal theory of scattering is developed and the importance of symmetries and rotations is discussed. Prerequisite: Phy 525.

PHY 531. ADVANCED GRADUATE LABORATORY**THREE CREDIT HOURS**

Advanced experiments in classical mechanics, electricity, magnetism, atomic, nuclear and solid state physics. Prerequisite: Approval of Graduate advisor.

PHY 590. GRADUATE THESIS**UP TO SIX CREDIT HOURS**

A research problem in selected topics of physics resulting in a written thesis.

PHY 595. GRADUATE SEMINAR**NO CREDIT**

Weekly Seminars presented by graduate students, faculty and guest lecturers on current topics.

PHY 599. SPECIAL PROBLEMS IN (NAMED AREA)**ONE TO THREE CREDIT HOURS**

Laboratory or library work in one of the following selected topics: Solid State Physics, Polymer Physics, X-Rays, Nuclear Physics, Modern Optics, General Physics, Advanced Quantum Mechanics. May be taken more than once.

Political Science (POL)**Dr. Norbert C. Brockman, S.M., *Chairman***

Graduate students in Political Science may take certain 300-400 level courses for graduate credit, under the usual conditions, but only with the permission of the Chairman of the Department.

POL 501. SCOPE AND METHOD IN POLITICAL SCIENCE**THREE CREDIT HOURS**

Explores the relation of Political Science to other disciplines, the proper methodologies, and the basic concepts of the study of politics.

POL 503. POLITICOMETRICS**THREE CREDIT HOURS**

A study of quantitative techniques with emphasis upon mathematical political analysis. Throughout, political literature and materials are used.

POL 504. THE SOVIET BLOC**THREE CREDIT HOURS**

Considers the political structure and economic organization of the communist world, with emphasis upon the Soviet Union and Communist China.

POL 506. GEOPOLITICS**THREE CREDIT HOURS**

Basic geopolitical concepts of land, sea, air, and military power are studied in the context of global geostrategy. A series of critical areas are taken in depth.

POL 508. AMERICAN FOREIGN POLICY**THREE CREDIT HOURS**

Attention will be given to the process of policy development and the substance of American foreign policies in regard to selected areas and problems.

POL 510. FEDERAL PUBLIC ADMINISTRATION**THREE CREDIT HOURS**

A study of the administrative system and the administrative process in the American national government. Structural and behavioral approaches are compared.

- POL 513. POLITICAL PHILOSOPHY THREE CREDIT HOURS
A study of the nature, origin and end of the political community; the forms and functions of government; and such specific topics as war and peace, political authority, and individual rights.
- POL 515. LATIN AMERICAN POLITICAL SYSTEMS THREE CREDIT HOURS
A study of the governments and political systems of the Latin American states, concentrating on the major nations. U.S. policies toward this area are discussed.
- POL 521. INTERGOVERNMENTAL RELATIONS THREE CREDIT HOURS
Interaction of different levels of government in the United States; problems of federalism; interstate compacts; federal-urban problems.
- POL 525. AFRICAN POLITICAL SYSTEMS THREE CREDIT HOURS
A study of the politics and governments of Black Africa, with emphasis upon contemporary developments.
- POL 530. INTERNATIONAL LAW THREE CREDIT HOURS
Principles and practice in public international law, including study of sources, institutions, and leading cases.
- POL 535. PUBLIC FINANCE THREE CREDIT HOURS
Study of tax systems, the budgetary process, and public fiscal management, with emphasis on current practice and problems.
- POL 540. PROBLEMS IN PUBLIC ADMINISTRATION THREE CREDIT HOURS
A seminar on selected problems in public management. May be repeated once.
- POL 545. COMMUNITY POLITICS AND MOBILIZATION THREE CREDIT HOURS
A study of the formal and informal patterns of political action and government in urban areas, relations among government units, community power structure and the formulation and execution of public policy.
- POL 550. GOVERNMENT AND BUSINESS THREE CREDIT HOURS
An analysis of the economic aspects and consequences of government regulation over social and business activities.
- POL 552. COMMUNITY PLANNING THREE CREDIT HOURS
Urban land utilization with an emphasis upon zoning, housing, and economic development. Urban renewal and criteria for land-use in inner-city areas are considered.
- POL 557. AMERICAN STATE GOVERNMENT THREE CREDIT HOURS
A study of the political institutions, systems, and processes of state government with consideration of the problems of federalism and constitutional reform.
- POL 560. SEMINAR IN AMERICAN POLITICAL THOUGHT THREE CREDIT HOURS
A study of basic political ideas that have influenced the development of American thought.
- POL 564. MARXIST POLITICAL THOUGHT THREE CREDIT HOURS
Early influences on Marxist thought; political philosophy of Marx and Engels; development of communist thought in the Soviet Union; Mao Tse-tung.

- POL 568. STUDIES IN POLITICAL THEORY THREE CREDIT HOURS
Directed research and readings on specific topics. May be repeated once.
- POL 569. SEMINAR IN POLITICAL THEORY THREE CREDIT HOURS
A research seminar with emphasis upon the effective use of research methods in studying particular problems. May be repeated once when the content changes.
- POL 571. CONSTITUTIONAL LAW THREE CREDIT HOURS
A study of the judicial process in the development of the American Constitution. Competing constitutional philosophies are explored in the context of landmark cases. Emphasis is placed upon contemporary developments.
- POL 572. ADMINISTRATIVE LAW THREE CREDIT HOURS
The judicial functions and activities of federal agencies; formal and informal processes in administrative hearings; basic principles of administrative law; judicial interpretation; the question of the increased judicialization of the administrative process.
- POL 575. SCIENCE AND PUBLIC POLICY THREE CREDIT HOURS
A study of the relationship between scientific-technical developments and governmental institutions, policies, and processes.
- POL 576. PUBLIC PERSONNEL ADMINISTRATION THREE CREDIT HOURS
A survey of the development of personnel administration in government. Specific questions such as position classification, morale, and recruitment are considered. Supplemented by visiting lecturers from government agencies.
- POL 577. MUNICIPAL GOVERNMENT THREE CREDIT HOURS
An analysis of urban government in the United States, with emphasis on contemporary problems of organization of services, urban renewal, and city planning.
- POL 578. STUDIES IN PUBLIC ADMINISTRATION THREE CREDIT HOURS
Directed research and readings on specific topics. May be repeated once.
- POL 579. SEMINAR IN GOVERNMENT THREE CREDIT HOURS
A research seminar with emphasis placed upon the effective use of research methods in studying particular problems. May be repeated once when the content changes.
- POL 581. ORGANIZATIONAL THEORY THREE CREDIT HOURS
A study of organization and contemporary bureaucracy in terms of decision-making and rationality; problems of authority; behavioral political, and technical influences on organization; and evaluation of various theoretical approaches to organization.
- POL 582. COMPARATIVE PUBLIC ADMINISTRATION THREE CREDIT HOURS
A study of the governmental administrative systems of Europe and the developing countries.
- POL 585. SOVIET FOREIGN POLICY THREE CREDIT HOURS
A study of the basic Soviet foreign policy process, emphasizing the role of the Community Party and its ideology. Discussion of areas of Soviet foreign policy.
- POL 588. STUDIES IN INTERNATIONAL RELATIONS THREE CREDIT HOURS
Directed research and readings on specific topics. May be repeated once.

POL 589. SEMINAR IN INTERNATIONAL AFFAIRS THREE CREDIT HOURS
A research seminar with emphasis placed upon the effective use of research methods in studying particular problems. May be repeated once when the content changes.

POL 595. GOVERNMENT INTERNSHIP THREE-SIX CREDIT HOURS
Assignment to appropriate government agencies or units for the purpose of gaining wide experience with the administrative system through a rotating program of work experience.

POL 599. THESIS THREE-SIX CREDIT HOURS
A research monograph demonstrating basic command of appropriate literature and research methodology.

Psychology (PSY)

Dr. Samuel M. Bower, *Acting Chairman*

PSY 501. ADVANCED STATISTICS THREE CREDIT HOURS
To provide a greater depth of understanding of the basic concepts of statistics and to introduce the students to some advanced statistical methods. Prerequisite: None.

PSY 508. ADVANCED EXPERIMENTAL PSYCHOLOGY THREE CREDIT HOURS
Theory of scaling; concepts on the transformation of data as applied to problems of sensory and cognitive functions. Prerequisite: Psy 501, permission of advisor. Two hours lecture and one two-hour lab per week.

PSY 515. ASSESSMENT OF INTELLIGENCE FOUR CREDIT HOURS
Focuses on individual assessment techniques and methods of intellectual appraisal and evaluation with children, adolescents and adults. Emphasizes psychometric theory, instrument development and clinical application of those individually administered instruments for assessing cognitive functioning. Major instruments for which experience in administration, scoring and interpretation will be provided are the Stanford-Binet, Wechsler Intelligence Scale for Children, Wechsler Pre-School and Primary Scale of Intelligence and the Wechsler Adult Intelligence Scale. Prerequisites: Psy 306, Psy 402.

PSY 516. PROJECTIVE TECHNIQUES FOUR CREDIT HOURS
Survey of the historical background and theoretical rationale underlying the use of personality assessment techniques, particularly projective methods with children, adolescents and adults. The Rorschach and Thematic Apperception Test are emphasized, including administration, scoring methods and interpretation. Other methods and techniques of personality evaluation are also considered. Prerequisites: Psy 515, Psy 560.

PSY 518. SOCIAL ADAPTATION THREE CREDIT HOURS
Presentation of research and theory related to social adaptation. Integrates relevant research findings and formulates hypotheses for the study of individual behavior and the social environment. Relates such concepts as evolution, ecology, life cycle crises, stress and social change to adaptation. Goal is to relate these concepts to mental health services. Prerequisites: Psy 560, Psy 561.

PSY 519. PRACTICUM IN PROJECTIVE TECHNIQUES THREE CREDIT HOURS
To give the student a first opportunity to gain familiarity with the administration, scoring, and interpretation of projective tests. The Rorschach and TAT will be emphasized, but the student will also be expected to show progressive mastery of other projective tests. Prerequisite: Psy 516. Permission of instructor. Requires 15-20 hours per week supervised experience in a clinical setting.

- PSY 521. DEVELOPMENTAL PSYCHOLOGY** THREE CREDIT HOURS
 Theory and research on psychological development from conception through adolescence, maturation of behavior systems, the role of social learning in development, the effects of early experience on personality development, critical stages in development. Prerequisite: Permission of advisor.
- PSY 530. LEARNING** THREE CREDIT HOURS
 To familiarize the students with the basic approach, concepts, and findings in the area of the psychology of learning. Prerequisite: Permission of advisor.
- PSY 531. LEARNING THEORY** THREE CREDIT HOURS
 To familiarize the students with the important learning theories of the past and the present; and the major issues among the theories. Prerequisite: Psy 501 and 530.
- PSY 532. THEORIES OF PERCEPTION** THREE CREDIT HOURS
 A systematic study of methods and research findings in the field of human perception, together with an evaluation of theoretical interpretations. Prerequisite: Psy 501 and permission of advisor.
- PSY 533. DECISION PROCESSES** THREE CREDIT HOURS
 The purpose of this course is to provide an understanding of the theoretical and empirical developments in the psychology of human decision-making and choice behavior. The relation of various models of decision behavior to other problem areas in psychology, e.g., learning and perception, are studied. Prerequisite: Psy 501.
- PSY 535. HISTORY AND SYSTEMS OF PSYCHOLOGY** THREE CREDIT HOURS
 Analysis and critical evaluation of contemporary psychological systems with an overview of their historical antecedents. Prerequisite: None.
- PSY 541. COMPUTER APPLICATIONS TO BEHAVIORAL SCIENCE** THREE CREDIT HOURS
 A survey is made of several psychological studies in which the use of the computer was critical to the experimental design. Prerequisite: Psy 501, permission of the advisor.
- PSY 560. THEORIES OF PERSONALITY** THREE CREDIT HOURS
 Exposition and discussion of contemporary personality theories with illustrations of the relation between theory and research. Prerequisite: None.
- PSY 561. CLINICAL PSYCHOLOGY** THREE CREDIT HOURS
 An integrated approach to the subject matter of clinical psychology through clinical inquiry (research) and clinical service (practice). Theory and use of clinical methods in psychology including interviewing, individual testing, observation, case documentation and professional problems. Aim is to view the so-called "disease entities" and "facts" as constructs of clinical experience and valid only to the extent that the methods through which they were inferred are valid. Prerequisite: Psy 313, permission of advisor.
- PSY 564. THEORIES OF PSYCHOTHERAPY** THREE CREDIT HOURS
 Conceptions of psychotherapy; theoretical and research issues in psychotherapy; goals of psychotherapy; place of psychotherapy in psychology and other fields. Prerequisite: Psy 560, permission of instructor.

PSY 565. PSYCHOPHYSIOLOGY THREE CREDIT HOURS
 The neurophysiological analysis of attention, sensation, perception, emotion, motivation, and learning. Electrophysiological methods are studied as techniques in the study of the nervous system and behavior. Prerequisite: Permission of advisor.

PSY 566. CLERKSHIP THREE CREDIT HOURS
 To train the student to develop sensitivity in clinical interviewing, behavior observation, test interpretation and psychotherapeutically oriented activities under supervision. Prerequisite: Psy 516, 519. Requires 15-20 hours per week supervised experience in a clinical setting.

PSY 579. PRACTICUM IN INTERVIEWING AND COUNSELING TWO CREDIT HOURS
 This course is designed to give the graduate student experience in counseling undergraduate students under supervision. This course would follow courses in theory in the counseling area. Prerequisite: Permission of advisor.

PSY 580. DEVELOPMENT OF MAN-MACHINE SYSTEMS THREE CREDIT HOURS
 Description of man-machine systems is provided upon which information processing, environmental engineering, and principles of system development are studied and discussed. Prerequisite: Permission of advisor.

PSY 581. CONTROL DISPLAY SYSTEMS THREE CREDIT HOURS
 The course is designed to help the student relate the measurement techniques and the findings of experimental psychology to the engineering problems of the operation by people of machines, particularly vehicles and computer systems. The information flow through the human operator in these systems will be covered from the standpoint of theory, research, evaluation of systems, and the input (displays) and output (controls) equipment on which that flow depends. Prerequisite: Permission of advisor.

PSY 585. EXPERIMENTAL SOCIAL PSYCHOLOGY THREE CREDIT HOURS
 Develop an understanding and working knowledge of scientific method in general and social psychology methods in specific. Demonstrate an ability to plan, conduct, and report on investigations in social psychology. Stress is placed on applying design methods to concepts and issues relevant to social psychology. Prerequisite: Psy 302, 308, 408.

PSY 590-591. MATHEMATICAL PSYCHOLOGY THREE CREDIT HOURS EACH TERM
 To familiarize the students with the role of mathematics, as a discursive, normative, and descriptive tool in psychology. Prerequisite: Psy 501.

PSY 592. SEMINAR IN STATISTICS THREE CREDIT HOURS
 To give the student a working knowledge of specialized statistical techniques such as analysis of variance, nonparametric statistics, correlational methods, etc. The specific statistical technique covered in the course may be different from one offering to the next depending upon the interests and desires of the graduate students and the judgments of the departmental faculty. Prerequisite: Psy 501.

PSY 596. EXPERIMENTAL RESEARCH ONE-SIX CREDIT HOURS
 Individual graduate students explore particular research areas. Under guidance of the instructor, research projects are formulated and conducted. Project reports are required. May be repeated. Prerequisite: Permission of advisor.

PSY 597. READINGS

ONE-THREE CREDIT HOURS

Intended to stimulate graduate students for establishing competence in areas of research and investigation.

PSY 599. THESIS

THREE CREDIT HOURS

Under guidance of major advisor student develops problem, constructs apparatus, collects data and provides interpretation of the data for staff assessment.

Theological Studies (THL)Rev. Matthew F. Kohmescher, S.M., *Chairman*

Any of the 300 and 400 level undergraduate courses in Theological Studies may count for graduate credit under the usual conditions.

THL 510. CHRISTINE DOCTRINE IN THE EARLY CHURCH

THREE CREDIT HOURS

An analysis of the development of doctrine from the sub-apostolic age to the beginning of the Middle Ages. Areas covered include: The Apostolic Fathers. The Apologists. Gnosticism. Irenaeus. Marcion. Tertullian. The Schools of Antioch, Alexandria, and Cappadocia. John of Damascus.

THL 511. CHRISTOLOGICAL CONTROVERSIES SURROUNDING CHALCEDON

THREE CREDIT HOURS

A critical, in-depth study of the great Christological controversies leading to the formulation of the Definition of Chalcedon, 451, A.D. Arius, Athanasius, Apollinaris, Cyril of Alexandria, the Cappadocian Fathers, Diodore, Theodore of Mopsuestia, Nestorius, Leo, and Eutyches.

THL 512. POST CHALCEDONIAN CHRISTOLOGIES

THREE CREDIT HOURS

The development of the theological interpretation of the Chalcedonian Christological formula in the Monophysitic controversy and in the Monothelitic controversy, and its classical exposition in John of Damascus.

THL 513. THE DOCTRINE OF THE TRINITY

THREE CREDIT HOURS

An examination of some of the classical interpretations of the Trinity from the early church to modern times. The problems involved in the relation of the Trinity to the Doctrine of God, Christology and the work of the Holy Spirit.

THL 514. JEWISH THOUGHT IN THE EARLY CHRISTIAN ERA

THREE CREDIT HOURS

An analysis of the influence of Jewish thought in the early Christian period with particular reference to Philo of Alexandria and Hellenistic Judaism.

THL 515. FATHERS OF THE CHURCH

THREE CREDIT HOURS

An analysis of the life and thought of individual Fathers of the Church. May be taken more than once. 1. Augustine, 2. Origen.

THL 522. MEDIEVAL THEOLOGIANS

THREE CREDIT HOURS

A critical study of the life and thought of individual medieval theologians. May be taken more than once. 1. Thomas Aquinas.

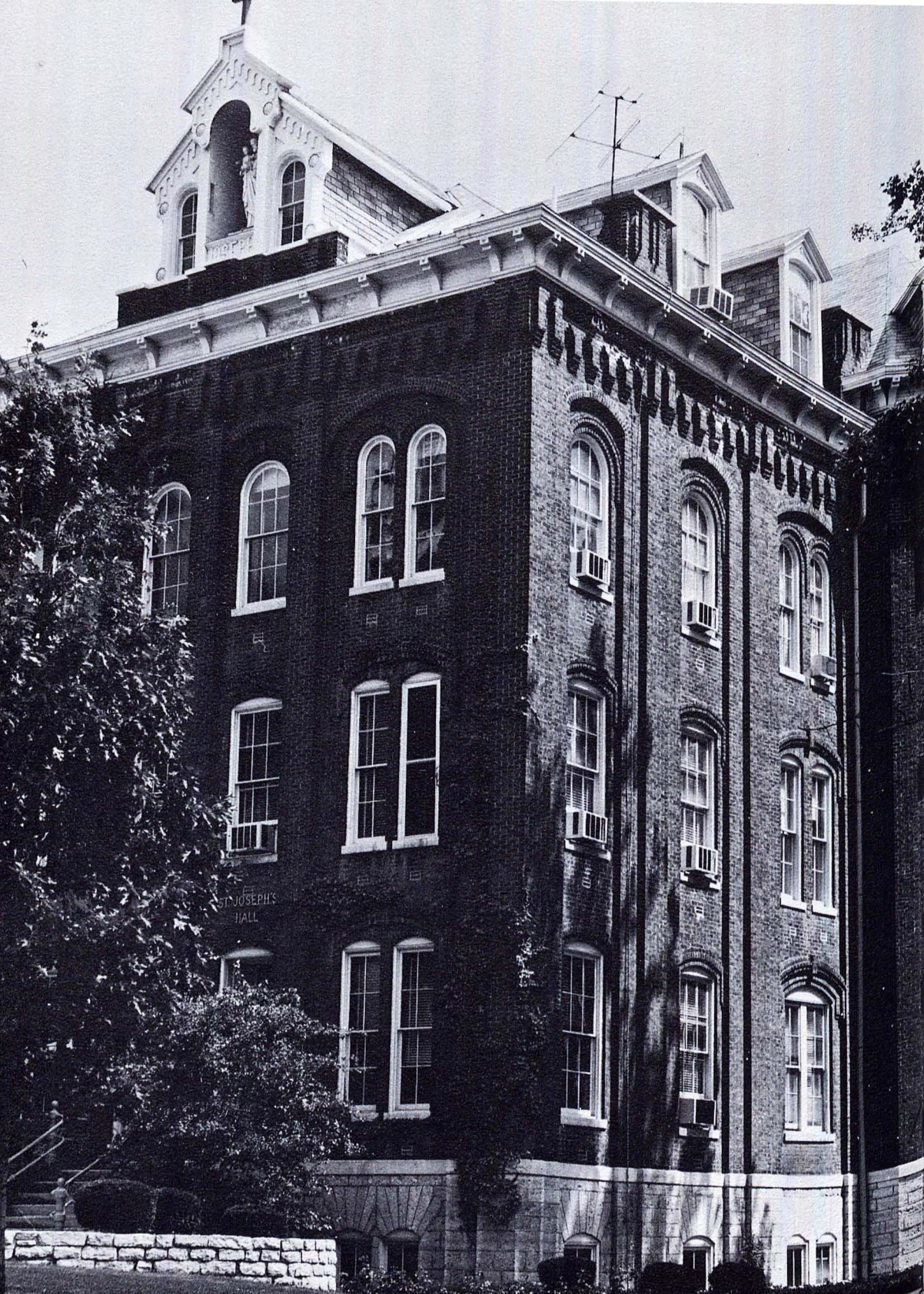
THL 525. THEOLOGY OF TRENT

THREE CREDIT HOURS

A critical and historical study of the teachings of the Council of Trent.

- THL 526. THE THEOLOGY OF REFORMERS THREE CREDIT HOURS
 Historical, critical and comparative studies of the theologies of Martin Luther, John Calvin, Huldreich Zwingli, and the Radical Reformers. Primary sources will be carefully and critically examined.
- THL 527. THE REFORMATION IN ENGLAND THREE CREDIT HOURS
 Historical and critical study of Anglicanism, Puritanism, and the Free Churches in England. The Episcopacy and Presbyterianism in Scotland. Primary sources will be carefully and critically examined.
- THL 528. THE REFORMATION AND AMERICAN THOUGHT THREE CREDIT HOURS
 An analysis, historical and critical, of the impact of the Continental and English Reformation on the formation and development of American Theological thought. Reactions, criticisms, and secessions.
- THL 543. FORM CRITICISM THREE CREDIT HOURS
 An investigation of the origin, development, and methodology of Form Criticism. Special attention will be given to both the theoretical understanding and practical application of this method of biblical criticism.
- THL 544. OT EXEGESIS THREE CREDIT HOURS
 A critical and exegetical study of selected writings of the Old Testament. May be taken more than once. 1. Psalms, 2. Job.
- THL 547. OLD TESTAMENT THEOLOGY THREE CREDIT HOURS
 An examination of the discipline of Old Testament Theology. Special consideration will be given to the relationship of history and theology.
- THL 551. NEW TESTAMENT BACKGROUNDS THREE CREDIT HOURS
 A thorough study of selected individual points, e.g. Gnosticism, Qumran, etc., which are needed for an understanding of the New Testament. May be taken more than once. 1. Qumran, 2. Gnosticism.
- THL 552. THE QUESTION OF THE HISTORICAL JESUS THREE CREDIT HOURS
 This course addresses itself to two large problem areas of New Testament interpretation, the complex of issues surrounding the question of the historical Jesus and the new hermeneutic, studying them in their historical perspective, present state of development and possible future directions.
- THL 554. NEW TESTAMENT EXEGESIS THREE CREDIT HOURS
 A critical and exegetical study of selected writings of the New Testament. May be taken more than once. 1. Luke-Acts, 2. Gospel of John, 3. I John, 4. Parables, 5. Romans.
- THL 557. NEW TESTAMENT THEOLOGY THREE CREDIT HOURS
 A thorough study of one theme in the theology of the New Testament. May be taken more than once.
- THL 560. THEOLOGICAL MOVEMENTS THREE CREDIT HOURS
 A study of selected movements in theology in the 19th and 20th centuries. May be taken more than once. 1. Liberalism and Modernism, 2. Process theology.
- THL 561. MODERN THEOLOGIANS THREE CREDIT HOURS
 An in-depth study of the life and work of selected modern theologians. May be taken more than once.

- THL 562. METHODOLOGY THREE CREDIT HOURS
An historical and critical treatment of selected problems inherent in the theological process. May be taken more than once.
- THL 564. THE CHRISTIAN DOCTRINE OF GOD THREE CREDIT HOURS
This course will concentrate primarily on the recent discussion about God, examining the major options in contemporary theology, including the theologies of the "death of God."
- THL 565. CHRISTOLOGY THREE CREDIT HOURS
An examination of the problems faced by contemporary theologians in discussing Jesus and his significance for Christian faith, and many of the solutions offered to these problems.
- THL 566. ECCLESIOLOGY THREE CREDIT HOURS
An in-depth study of selected teachings on the nature, structure, mission of the Church and her relationship to other Christian churches, to world religions and to the world. May be taken more than once. 1. Ecclesiology of Vatican II, 2. Ecclesiology of Yves Congar.
- THL 567. SACRAMENTAL THEOLOGY THREE CREDIT HOURS
A detailed study of the principle of sacramentality and of the individual sacraments accenting the historical developments of each and the contemporary renewal.
- THL 568. MARY & CHRIST THREE CREDIT HOURS
A study of the role of the Mother of God in the Incarnation with special treatment of the Divine Maternity and its relation to the Spiritual Maternity and to the other functions of Mary.
- THL 569. MARIAN QUESTION TODAY THREE CREDIT HOURS
A detailed treatment of the present situation in the light of chapter 8 of the Constitution on the Church with special emphasis on ecumenical considerations.
- THL 572. APPROACHES TO MORALITY THREE CREDIT HOURS
An attempt to establish the foundations of Christian morality, consisting of an historical survey of approaches and developments from the New Testament period to the present.
- THL 573. EVOLUTION AND ETHICS THREE CREDIT HOURS
The contemporary theology of Christian existence as a whole, stressing the conscious unity of existence; the implications of evolution for theology and ethics.
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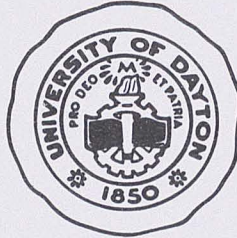
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The Seal of the University of Dayton was created in 1920 when the school amended its articles of incorporation with the State of Ohio to change its name from St. Mary's College. The date 1850 represents the original foundation of this institution.

The open book together with the geared wheel fittingly conveys the interrelation between the humanities and the sciences both illumined by the torch of God-given intellect and faith.

The flaming torch serves, moreover, to emblazon the letter "M" proclaiming the Marian spirit of the religious organization (Marianists) which conducts the University.

Finally the University's motto "Pro Deo et Patria" (For God and Country) is a constant reminder that the completeness of education lies in serving both God and mankind.

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