1964-1965 Bulletin

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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 Dean of the University.
The University of Dayton Bulletin

The Graduate Catalog Issue
1964-65

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

DAYTON 9, OHIO
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Academic Calendar
1964-1965

**First Term**

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 29</td>
<td>Saturday</td>
<td>Registration (8:30 a.m.-11:30 p.m.)</td>
</tr>
<tr>
<td>September 1</td>
<td>Tuesday</td>
<td>Registration (6:00 p.m.-9:30 p.m.)</td>
</tr>
<tr>
<td>September 2</td>
<td>Wednesday</td>
<td>Registration (6:00 p.m.-9:30 p.m.)</td>
</tr>
<tr>
<td>September 3</td>
<td>Thursday</td>
<td>Registration (6:00 p.m.-9:30 p.m.)</td>
</tr>
<tr>
<td>September 8</td>
<td>Tuesday</td>
<td>Day and Evening classes begin.</td>
</tr>
<tr>
<td>September 12</td>
<td>Saturday</td>
<td>Last day for late registration.</td>
</tr>
<tr>
<td>September 14</td>
<td>Monday</td>
<td>Last day for change in schedules.</td>
</tr>
<tr>
<td>September 28</td>
<td>Monday</td>
<td>Last day for withdrawal without record.</td>
</tr>
<tr>
<td>November 21</td>
<td>Saturday</td>
<td>Teacher Education Examination Program and Graduate Record Examination. (File applications two weeks in advance.)</td>
</tr>
<tr>
<td>November 25</td>
<td>Wednesday</td>
<td>Thanksgiving recess begins after last class.</td>
</tr>
<tr>
<td>November 30</td>
<td>Monday</td>
<td>Classes resume.</td>
</tr>
<tr>
<td>December 8</td>
<td>Tuesday</td>
<td>Feast of Immaculate Conception. (No classes.)</td>
</tr>
<tr>
<td>December 19</td>
<td>Saturday</td>
<td>Term ends after last class.</td>
</tr>
</tbody>
</table>

**Second Term**

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 5</td>
<td>Tuesday</td>
<td>Registration (6:00 p.m.-9:30 p.m.)</td>
</tr>
<tr>
<td>January 6</td>
<td>Wednesday</td>
<td>Registration (6:00 p.m.-9:30 p.m.)</td>
</tr>
<tr>
<td>January 7</td>
<td>Thursday</td>
<td>Day and Evening classes begin.</td>
</tr>
<tr>
<td>January 12</td>
<td>Tuesday</td>
<td>Last day for Late Registration.</td>
</tr>
<tr>
<td>January 13</td>
<td>Wednesday</td>
<td>Last day for change in schedules.</td>
</tr>
<tr>
<td>January 16</td>
<td>Saturday</td>
<td>Teacher Education Examination Program and Graduate Record Examination. (File application two weeks in advance.)</td>
</tr>
<tr>
<td>January 26</td>
<td>Tuesday</td>
<td>Last day for withdrawal without record.</td>
</tr>
<tr>
<td>April 13</td>
<td>Tuesday</td>
<td>Easter recess begins after last class.</td>
</tr>
<tr>
<td>April 20</td>
<td>Tuesday</td>
<td>Classes resume.</td>
</tr>
<tr>
<td>April 24</td>
<td>Saturday</td>
<td>Term ends after last class.</td>
</tr>
<tr>
<td>April 25</td>
<td>Sunday</td>
<td>Graduation Exercises.</td>
</tr>
</tbody>
</table>
**Third Term—First Half**

<table>
<thead>
<tr>
<th>April</th>
<th>30</th>
<th>Friday</th>
<th>Registration (6:00 p.m.-9:30 p.m.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>May</td>
<td>1</td>
<td>Saturday</td>
<td>Day and Evening classes begin.</td>
</tr>
<tr>
<td>May</td>
<td>15</td>
<td>Saturday</td>
<td>Teacher Education Examination Program. (File application two weeks in advance.)</td>
</tr>
<tr>
<td>May</td>
<td>4</td>
<td>Tuesday</td>
<td>Last day for late registration.</td>
</tr>
<tr>
<td>May</td>
<td>5</td>
<td>Wednesday</td>
<td>Last day for change in schedules.</td>
</tr>
<tr>
<td>May</td>
<td>10</td>
<td>Monday</td>
<td>Last day for withdrawal without record.</td>
</tr>
<tr>
<td>May</td>
<td>27</td>
<td>Thursday</td>
<td>Ascension Thursday. (No classes.)</td>
</tr>
<tr>
<td>June</td>
<td>19</td>
<td>Saturday</td>
<td>Term ends after last class.</td>
</tr>
</tbody>
</table>

**Third Term—Second Half**

<table>
<thead>
<tr>
<th>June</th>
<th>19</th>
<th>Saturday</th>
<th>Registration (8:30-11:30 a.m.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>21</td>
<td>Monday</td>
<td>Day and Evening classes begin.</td>
</tr>
<tr>
<td>June</td>
<td>23</td>
<td>Wednesday</td>
<td>Last day for late registration.</td>
</tr>
<tr>
<td>June</td>
<td>24</td>
<td>Thursday</td>
<td>Last day for change in schedules.</td>
</tr>
<tr>
<td>June</td>
<td>30</td>
<td>Wednesday</td>
<td>Last day for withdrawal without record.</td>
</tr>
<tr>
<td>July</td>
<td>10</td>
<td>Saturday</td>
<td>Teacher Education Examination Program and Graduate Record Examination. (File application two weeks in advance.)</td>
</tr>
<tr>
<td>August</td>
<td>7</td>
<td>Saturday</td>
<td>Term ends after last class.</td>
</tr>
</tbody>
</table>

**First Term 1965-66**

<table>
<thead>
<tr>
<th>August</th>
<th>28-September 2</th>
<th>Registration</th>
</tr>
</thead>
<tbody>
<tr>
<td>September</td>
<td>7</td>
<td>Tuesday</td>
</tr>
</tbody>
</table>
MAIN CAMPUS

LEGEND
1. Albert Emanuel Library
2. Fieldhouse
3. Flyers Hangar
4. Baujan Field
5. St. Joseph Hall
6. Chapel of the Immaculate Conception
7. St. Mary Hall
8. Women’s Gymnasium, Music Building
9. Post Office
10. Chaminade Hall
11. Liberty Hall
12. Zehler Hall
13. Power House
14. Religion Building
15. John F. Kennedy Memorial Union
16. School of Business Administration
17. Sherman Hall of Science
18. Wohleben Hall
19. Alumni Hall
20. Founders Hall
21. ROTC Building
22. Mechanical Engineering Laboratory
23. Marycrest Residence Hall
24. Stuart Hall
25. Maintenance and utility buildings
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; The International Council on Education for Teaching; The National Catholic Educational Association; The National League for Nursing; 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.
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.

APPLICATION FOR ADMISSION
Inquiries concerning admissions and requests for application forms should be addressed to the Dean of the school in which the applicant wishes to become a candidate for a degree, that is, the Dean of the Graduate School of Arts and Sciences, the Dean of the School of Business Administration, the Dean of the School of Education, or the Dean of the School of Engineering.

The application for admission to graduate work should be submitted by August 1 for the fall 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, to pursue a program leading to a degree. In addition to the information required of all students, the foreign student must submit with his application for admission:

1. A statement from a qualified official that the applicant can read, write, speak, and understand English sufficiently to pursue a program of graduate work in the field of his choice (exception being made for those whose native language is English).

2. A statement certified by a responsible person or group that his finances are sufficient to maintain him while in residence.
3. A statement by a responsible medical authority certifying to the student's physical, mental, and emotional balance adequate for the work he intends to undertake.

CLASSIFICATION OF STUDENTS AFTER ADMISSION

Regular Students

Regular students are those who have met satisfactorily all the general requirements of the school in which the student is accepted and the specific requirements of the Department in which he is working.

Special Students

Special students are those who belong to any of the following categories:
1. Those on conditional status, that is to say, applicants who must fulfill some prerequisite imposed by the specific School and Department, before their admission to regular status.
2. Non-programmed students who fulfill all requirements and are taking courses for credit, but are not seeking a degree.
3. 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 regular students.
4. Those 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 the registration requirements in the given course that are mandatory for students working toward a degree at the University of Dayton.

DEGREES

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

SPECIFIC REQUIREMENTS FOR ALL DEGREES

Course Requirements

To date the Schools of Arts and Sciences, Business, 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. Each School also provides through a particular course-offering, a philosophical orientation to the over-all intent of the graduate programs in order to insure correlation with the general purposes of the University.
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.

Time Limit

All requirements for a Master's degree must be satisfied within five calendar years from the time of admission to candidacy.

Graduate Work in Other Institutions

A maximum of six semester credit hours of graduate work may be allowed in transfer from other accredited institutions provided the work be of "B" grade quality or better. 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:

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 the 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.
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—Good ................................. 3 quality points
C—Passing ............................... 2 quality points
F—Failing ................................ 0 quality points
I—Incomplete ............................ 0 quality points
W—Withdrawal ........................... 0 quality points
Graduate students must maintain a general three-point average to be eligible for
candidacy and for the comprehensive examinations.

Admission to Candidacy
It is the student’s responsibility to apply for admission to candidacy. Application blanks
may be obtained from the Dean’s office. The most important consideration in the
admission of a student to candidacy is the qualitative standard of the student’s record
in his graduate work. Applicants who are deemed unqualified at this point will be
advised to discontinue their program.

Comprehensive Examinations
A comprehensive examination is required by all Schools for the Master’s degree. 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. Students who fail in a comprehensive
examination may on the recommendation of the Chairman of the Department, be
admitted to a second examination, but not sooner than the next term or summer
session, and no later than one calendar year. If a second examination is unsatisfactory,
no further trial may be granted.

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.

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 late 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. Normally not more than six semester credit hours of the student’s total graduate program may be selected from designated upper-division (300-400) courses.
2. When upper-division courses are permitted for credit on the graduate level, the work done in such courses shall be of “B” grade or better.

REGISTRATION
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. Graduate students register on the regular registration days on the dates and at the times assigned to the evening school. The written approval of the proper Dean is required for admission to any course.

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

Graduate students have the privilege of open access to the stacks in the Albert Emanuel Library upon presentation of their registration card to the librarian.

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 on second floor of Albert Emanuel Library.
   d. Education . . . Curriculum Library on second 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.
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.

For transcripts of records, application should be made to the Office of the Registrar of the University. Transcripts are issued only as requested by the student. In normal periods of the calendar year, excluding principally registration or examination periods, a time allowance of a week should be made for the preparation of a transcript. The first copy requested after graduation will be issued gratis. For each additional record, a fee of $1.00 will be charged.
Financial Information

GENERAL REGULATIONS

It is a general rule of the University that tuition and laboratory fees are payable before attendance at any instructional or laboratory period, unless exceptional arrangements have been made with the Business Manager of the University and cleared by him in writing through the office of the Treasurer.

All fees are subject to change at the discretion of the Trustees of the University.

Applications for refunds on any kind of fees will be given consideration only within the limits of time and amount set by the general rules of the University.

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 Title 38, United States Code, is made at the Veterans Administration in Cincinnati. Advice and consultation for veterans may be had at the Veterans Service Office of the University of Dayton in St. Mary’s Hall.

TUITION AND FEES

*Tuition for Courses Taken for Undergraduate Credit*

- Per registered credit hour for lecture course: $21.00
- Per clock hour for laboratory course: $14.00

*Tuition for Courses Taken for Graduate Credit*

- Per registered credit hour for lecture course: $24.00—$30.00
- Per clock hour for laboratory course: $18.00
FINANCIAL INFORMATION

Fees

Registration .......................................................... $ 2.00
Penalty for late registration ....................................... $ 5.00
A second comprehensive examination ............................ $25.00
A second language examination .................................... $10.00
A deferred semester examination .................................. $ 5.00
Graduation ............................................................... $25.00
Transcripts: First transcript ........................................ No charge
Each subsequent transcript .......................................... $ 1.00

FELLOWSHIPS, SCHOLARSHIPS, ASSISTANTSHIPS

A limited number of Research Fellowships and of Research or Teaching Assistantships are available to students who are qualified. These carry a stipend and tuition refund provision which enables 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.
Graduate School 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 enable the student to pursue studies toward more advanced degrees.
b. To qualify the student for industrial and governmental careers in the field of Applied Biology.
c. To equip teachers for scholarly competence in Biology.

*Specific Requirements of the Department:*
a. Undergraduate prerequisites: 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, usually Algebra and Trigonometry.

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

b. Seminars: Graduate students are required to participate in seminars conducted by the Department of Biology. A maximum of two graduate credit hours will be permitted for these seminars.

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

1) Thirty credit hours of acceptable course work and research. The graduate student is permitted three to six credit hours for research.

2) The graduate student must have included in his academic record, either at the undergraduate or graduate level, courses in Genetics, Physiology, Microbiology and Histology.

3) Pro-Seminar: Will be offered at regular intervals to satisfy University requirements; may be replaced by Phl 505: Inter-Disciplinary Seminar.

4) A general written examination following the completion of a major portion of the course requirements.

5) The presentation and acceptance of a thesis based on the student's laboratory research problem. At the discretion of the departmental Graduate Committee, the graduate student may be permitted to present an acceptable thesis based on an exhaustive literature research or a project approved by the Department.

Course Offerings:
The program is designed so that part-time students will be able to obtain the Master's degree in five terms of late afternoon, evening, and summer sessions.
The course offerings for 1964-65 are as follows:

First Term—August 1964:

Bio 407 Embryology
Bio 410 Radiation Biology
Bio 411 General Bacteriology
Bio 501 Seminar
Bio 599 Thesis

Second Term—January 1965:

Bio 412 Human Genetics
Bio 416 Pathogenic Bacteriology
Bio 501 Seminar
Bio 590 Pro-Seminar (Phl 505)
Bio 599 Thesis
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. Requirements in terms of credit hours for the Master's Degree in Chemistry: Twenty-four credit hours of course work and six credit hours of research are required. A thesis based on the research, which may be an exhaustive literature search, is required. Every thesis must be approved by a Thesis Committee, appointed by the Chairman of the Department.
The following courses are required:

- Chm 503 Advanced Inorganic Chemistry
- Chm 504 Advanced Inorganic Chemistry
- Chm 505 Advanced Organic Chemistry
- Chm 506 Advanced Organic Chemistry
- Chm 507 Advanced Physical Chemistry
- Chm 508 Advanced Physical Chemistry
- Chm 510 Pro-Seminar or Phl 505 Inter-Disciplinary Seminar
- Chm 520-521 Research

Electives:

Three hours of electives which may be taken from the following listing. Other electives may be chosen with the approval of the Chairman of the Chemistry Department.

- Chm 511 Biochemistry
- Chm 514 Advanced Analytical Chemistry
- Mth 421 Advanced Calculus I
- Phy 420 Introduction to the Solid State
- Phy 440 X-Rays

Course Offerings:

The program is designed so that part-time students will be able to obtain the Master's degree in five terms of late afternoon and evening sessions.

The course offerings for 1964-65 are as follows:

- First Term—August 1964:
  - Chm 507 Advanced Physical Chemistry
  - Chm 511 Biochemistry
  - Chm 520 or 521 Research

- Second Term—January 1965:
  - Chm 508 Advanced Physical Chemistry
  - Chm 514 Advanced Analytical Chemistry
  - Chm 520 or 521 Research
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 should be submitted 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 course: English 592, Philosophical and Critical Foundations of Literature or an equivalent Philosophical course is required of all applicants for the degree.

d. Number and kind of courses: Any of the 400 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 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 Department Chairman.
Courses of Instruction:

All of the courses listed below would meet for two hours but yield three hours credit. The starred courses can be repeated for graduate credit when the topic or content changes.

*505 Creative Writing
511 Middle English
*514 Studies in Medieval Literature
516 Chaucer I
517 Chaucer II
*522 Studies in 16th Century Literature
526 Shakespeare I
527 Shakespeare II
*532 Studies in 17th Century Literature
*536 Studies in Drama to 1642
*538 Studies in Milton
*542 Studies in 18th Century Literature
*546 Studies in the Novel
*552 Studies in Romanticism
*556 Studies in 19th Century Literature
*562 Studies in 20th Century Literature
*566 Studies in the Drama Since 1660
572 Transcendentalism in 19th Century American Literature
*576 Major American Writers
*582 Studies in American Literature Since the Civil War
590 Teaching of College English (required of and open to assistants only)
592 Philosophical and Critical Foundations of Literature
595 Research and Bibliography
599 Thesis (three to six credit hours)

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. Number and kind of courses allowed for advanced undergraduate and graduate students: A maximum of six graduate credit hours may be taken from the upper level course offerings in History or in an allied field (see “e” below). These are the 300 and 400 courses listed in the University catalog.

Courses for which undergraduate credit has been allowed 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 or Phl 505 Inter-Disciplinary Seminar
   Hst 545  Seminar in Non-American History or
   Hst 595  Seminar in American History

d. Credit hour requirement for the Master's degree in History: A minimum of thirty semester credit hours is required for the Master's degree in History. Nine semester credit hours must be taken from the list of required courses; fifteen semester credit hours may be taken from the list of subject matter courses; six semester credit hours will be granted for the thesis.

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 is required of all candidates for the Master's degree in History. A maximum of six semester credit hours will be granted for the successful completion of the thesis (Hst 599).

g. Examination: An oral comprehensive examination must be passed by the candidate in his final term of study at least two weeks prior to graduation. Detailed instructions concerning this examination may be obtained from the Department Chairman.

Courses of Instruction:

   Hst 500  Historiography
   Hst 501  Greek and Roman Civilization
   Hst 505  Great African States
   Hst 506  Medieval Civilization
   Hst 521  Tudor-Stuart England
   Hst 522  Victorian England
   Hst 528  Soviet Union since 1917
   Hst 531  The Civilization of the Far East
   Hst 540  Interpretations in World History
   Hst 545  Seminar in Non-American History
   Hst 550  The Philosophy of History
   Hst 552  The American Revolution
   Hst 555  The Immigrant in America
   Hst 570  The Old South
   Hst 580  History of the Labor Movement in the U.S.
   Hst 585  Science and Technology in American History
   Hst 590  Interpretations in American History
   Hst 595  Seminar in American History
   Hst 599  Thesis
Course Offerings:
The program is designed so that students will be able to obtain the Master's degree in five terms of summer, late afternoon and evening sessions. The course offerings for 1964-65 are as follows:

Third Term (1st Session) 1964:
- Hst 302 Renaissance and Reformation
- Hst 545 Seminar in Non-American History
- Hst 599 Thesis

Third Term (2nd Session) 1964:
- Hst 380 Diplomatic History of the United States
- Hst 403 History of Modern Communism
- Hst 528 Soviet Union since 1917
- Hst 590 Interpretations in American History
- Hst 599 Thesis

First Term—August 1964:
- Hst 550 Philosophy of History
- Hst 599 Thesis

Second Term—January, 1965:
- Hst 552 The American Revolution
- Hst 599 Thesis

NOTE: Additional courses on the 300 and 400 level will be offered each term which may be taken for Graduate credit subject to the restrictions in 2b above.

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 301 three hours
- Mth 361 three hours
- Mth 421-422 six hours

NOTE: (1) Other courses in Advanced Analysis may replace Mth 422 in this requirement.
(2) All 400 courses in the Department may be allowed for graduate students in Mathematics, except Mth 421.
b. Graduate requirements:

(1) Obligatory courses as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mth 521-522</td>
<td>Real Variables</td>
<td>six hours</td>
</tr>
<tr>
<td>Mth 525</td>
<td>Complex Variables</td>
<td>three hours</td>
</tr>
<tr>
<td>Mth 561 or 565</td>
<td>Abstract Algebra</td>
<td>three hours</td>
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<tr>
<td></td>
<td>Linear Algebra</td>
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<tr>
<td>Mth 471 or 571</td>
<td>Topology</td>
<td>three hours</td>
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<tr>
<td></td>
<td>Linear Topological Spaces</td>
<td></td>
</tr>
<tr>
<td>Mth 599</td>
<td>Philosophical Foundations</td>
<td>three hours</td>
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<tr>
<td></td>
<td>of Mathematics</td>
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</tr>
</tbody>
</table>

(2) Requirements for Degree:

Thirty hours, as follows:

- 18 hours of required courses listed above as obligatory.
- 6 hours maximum of advanced undergraduate courses chosen from 400 courses.
- 6 hours maximum of approved courses outside of Department.

(3) A thesis with a maximum of six credit hours shall be permitted only in exceptional cases.

(4) No foreign language as such shall be required, but the students may expect to be assigned reading from Journals and Reference Works in French or German.

Courses of Instruction:

- Mth 411-412-413 Probability and Statistics
- Mth 417 Numerical Analysis
- Mth 421-422 Advanced Calculus
  (Mth 421 not offered for graduate credit to students in Mathematics.)
- Mth 432 Fourier Series
- Mth 461 Complex Variables
- Mth 465 Modern Operational Methods
- Mth 471 Topology
- Mth 521-522 Real Variables
- Mth 525-526 Complex Variables
- Mth 531-532 Advanced Differential Equations
- Mth 535-536 Partial Differential Equations
- Mth 541-542 Operational Methods
- Mth 545 Special Functions
- Mth 551-552 Methods of Mathematical Physics
- Mth 555-556 Advanced Numerical Analysis
Course Offerings:
The program is designed so that part-time students will be able to obtain the Master's degree in five terms of late afternoon and evening sessions.
The course offerings for 1964-65 are as follows:

First Term—August 1964:
- Mth 411 Probability and Statistics I
- Mth 413 Probability and Statistics III
- Mth 461 Introduction to the Theory of Functions of a Complex Variable
- Mth 525 Complex Variables I
- Mth 561 Abstract Algebra

Second Term—January 1965:
- Mth 412 Probability and Statistics II
- Mth 471 Topology
- Mth 526 Complex Variables II
- Another 500 course to be determined
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 Thomistic philosophy and of other 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 Graduate School 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 the following undergraduate courses: Logic, Cosmology, Philosophical Psychology, Epistemology, General Metaphysics, Natural Theology, Ethics, History of Greek, and Medieval Philosophy.

b. Advanced Undergraduate Courses Open to Graduate Students: Only two courses are permitted. Offerings will be restricted to a choice from the following:

- Phl 408 History of Modern Philosophy
- Phl 410 History of Political Philosophy
- Phl 430 Philosophy of Plato
- Phl 432 Philosophy of Aristotle
- Phl 434 St. Thomas Aquinas
c. Obligatory Core Courses: Six credit hours of core courses will be required of all regular students for the M.A. in Philosophy. The courses which constitute the core are listed under "Courses of Instruction" as Phl 515 and Phl 525.

d. 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. At the discretion of the Chairman, six of these hours may be taken in an allied field, as listed in Courses of Instruction, (3), (c), in this Outline.

e. Thesis Requirement: A thesis will be required of all students in this program. An outline of his thesis should be submitted by the student to the Chairman three months prior to the expected graduation.

f. Language Requirement: All students will be required to pass an examination on their reading knowledge of a foreign language. A reading knowledge of philosophical Latin, of French or of German will satisfy this requirement.
Courses of Instruction:
A distinctive feature of the Graduate Program in Philosophy is the special emphasis on Modern Philosophy.

a. Core Courses:
   - Phl 515 Methods of Research in Philosophy Seminar
   - Phl 525 Thomistic Texts and Commentaries
   - Phl 540 Aristotle's De Anima and St. Thomas' Commentary

b. Areas of Concentration:
   - Phl 545 Modern French Philosophy
   - Phl 555 Modern German Philosophy
   - Phl 560 Modern British Philosophy
   - Phl 565 The History and Literature of American Philosophy
   - Phl 570 Existentialist Philosophy

c. Allied Fields:
   - Thl 500 Philosophy of Religion
   - Edu 502 Comparative Philosophies of Education
   - Phl 504 Philosophy of Art
   - Phl 505 Inter-Disciplinary Seminar
   - Hst 550 Philosophy of History

Program for the M.A. In Philosophy:
The program is so designed that part-time students will be able to obtain the Master's degree in five terms of late afternoon, evening, and summer sessions.

Course Offerings:
   - First Term—August 1964:
     Phl 570 Existentialist Philosophy
     Phl 408 History of Modern Philosophy
   - Second Term—January 1965:
     Phl 525 Thomistic Texts and Commentaries
     Phl 505 Inter-Disciplinary Seminar
   - Summer 1965:
     Phl 565 The History and Literature of American Philosophy
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. The graduate student may use his advanced study in Physics in several immediate ways:

a. As a preparation 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-Phy 304 Intermediate Mechanics
   - Phy 408-Phy 409 Advanced Electricity & Magnetism
   - Phy 301 Thermodynamics
   - Phy 404 Physical Optics
   - Phy 311-Phy 321 Atomic & Nuclear Physics

   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. Courses required of all degree students.
   - Phy 511 Classical Mechanics
   - Phy 513 Electromagnetic Theory
   - Phy 516* Philosophical Basis of Modern Physics
   - Phy 517 Quantum Mechanics
   *Phl 505 may be substituted for Phy 516.

2. At least six hours must be chosen from the following group of courses.
   - Phy 515 Statistical Mechanics
   - Phy 520 Advanced Solid State Physics
Phy 521  Advanced Nuclear Physics  three credit hours
Phy 531  Advanced Graduate Laboratory  three credit hours
Phy 599  Special Problems  one to three credit hours

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 graduate student adviser. 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.

Course Offerings:
   The program is designed so that qualified part-time students will be able to obtain the Master's degree in five terms of late afternoon and evening sessions. The course offerings for 1964-65 are as follows:
   First Term—August 1964
   Phy 511  Classical Mechanics
   Phy 515  Statistical Mechanics
   Second Term—January 1965
   Phy 513  Electromagnetic Theory
   Phy 517  Quantum Mechanics
   Phy 531  Advanced Graduate Laboratory
THE MASTER'S PROGRAM IN THEOLOGICAL STUDIES

Statement of Purpose:
The graduate program of Theological Studies, leading to the degree of Master of Arts in that subject, is designed to satisfy the desire of religious and laity for a scientific training in sacred truth. It is of special value to teachers of Christian doctrine, for it provides them with a thorough grasp of the deep realities of Catholic theology, which is essential for effective teaching.

With the truth of the Incarnation as its core, the program follows a systematic curriculum of Catholic theological study. Courses in related fields are likewise offered. Because of the Marianist tradition at the University of Dayton, and the unique facilities afforded by the Marian Library, special programs will be offered in Mariology and the social apostolate. Thus the student will be given the opportunity for a deeper understanding of Catholic theology and an orientation toward his role in the Marian apostolate of the Church.

Specific Requirements of the Department:

a. Undergraduate prerequisites: Ordinarily, thirty hours of undergraduate theology and philosophy are required.

b. Use of advanced undergraduate courses in the graduate program: Not more than six graduate semester credit hours of the student's total graduate program may be selected from designated upper-division courses. All four hundred courses except 406, 407, and 408 are "designated upper-division courses."

c. Obligatory core courses: Among the graduate courses, 500 and 501 are courses in "allied fields" and must be taken by all candidates for the Master's Degree in Theological Studies.

d. Types of programs and specific requirements of each: The department offers two programs leading to a Master of Arts in Theological Studies:

(1) An Academic Program: Twenty-four hours of content courses plus six hours for a thesis. The twenty-four hours must include six hours of core courses, twelve hours from a chosen field of concentration, and six hours from the other area of concentration. All who elect this program must have a reading knowledge of a foreign language (Latin, French, German, Italian, or Spanish) in order to pursue profitably the work of a thesis.

(2) A Professional Program: Thirty hours of content courses with a monograph on a problem defined in a seminar, preferably toward the end of the student's graduate studies. The thirty hours ordinarily include six hours of core courses, fifteen hours from a chosen major field of concentration, and nine hours from the other area of concentration.
Program for the M.A. In Theological Studies:
The program leading to a Master's degree in Theological Studies is offered only in the Summer Sessions. It must be completed within seven calendar years. A full-time program in Theological Studies is offered conjointly by the University of Dayton (the core courses) and St. Charles Seminary (the areas of concentration). Details of this program, along with the descriptions of the courses offered at St. Charles, can be found in the Catalog of St. Charles Seminary, Carthagena, Ohio.

Courses of Instruction:

a. Core courses: (six hours) Common to all programs.
   Thl 500  Philosophy of Religion (Prerequisite: Phl 207)
   Thl 501  History of Religion

b. Areas of concentration: (Nine to fifteen hours)
   (1) The Advent of the Incarnation: Mariology
      Thl 505  Theology of Incarnation
      Thl 520  Role of the Mother of God in the Incarnation
      Thl 521  Privileges of the Mother of God
      Thl 522  History of Mariology
      Thl 590  Seminar with Monograph
      Thl 599  Thesis
(2) The Incarnation in History: The Church and the Apostolate
Thl 540 The Church of Christ
Thl 541 Church and State
Thl 542 The Catholic Church in America
Thl 543 Missiology: The Missionary Movement in the Church
Thl 544 Theological Perspectives of the Apostolate
Thl 545 Canon Law for the Laity
Thl 590 Seminar with Monograph
Thl 599 Thesis

Course Offerings:
Summer 1964:
Thl 500 Philosophy of Religion
Thl 501 History of Religion
Thl 541 Church and State
Another 500 course to be determined
Summer 1965:
Thl 500 Philosophy of Religion
Thl 501 History of Religion
Thl 505 Theology of Incarnation
Another 500 course to be determined
1. AIMS AND OBJECTIVES
Graduate study in business administration at the University of Dayton provides an educational opportunity to qualified men and women for advanced study and training for positions of leadership in business, industry, government and the professions.

The program leading to the Master of Business Administration degree has as its primary objective the provision of a broad, analytical background in the several areas of administration and management. The M.B.A. is designed to be a professional degree and accordingly the amount of specialization in any one area is limited to avoid a circumscribed curriculum.

The M.B.A. may be completed by choosing evening or Saturday morning classes, or a combination of these. This is done to enable persons employed in a full-time position to pursue advanced study.

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

Those in the first group 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, 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 on the Graduate Record Examination or the admission test for graduate study in business.
3. Personal interview.
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 either the Graduate Record Examination or the admission test for graduate study in business. To register for the examination, request an application form from the School of Business Administration office and forward the completed form to the Educational Testing Service, Princeton, New Jersey, thirty days before the examination is to be held.

A personal interview is desired and may be arranged at any time.

Two copies of the application for admission should be submitted.

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.
3. REQUIREMENTS
The candidate for the M.B.A. degree must complete a minimum of thirty hours of prescribed work. A minimum of twenty-four hours must be in graduate courses.

A minimum overall grade point average of 3.0 is required for all courses for which graduate credit has been granted. In case a candidate wishes to include an undergraduate course in his program, he must receive a grade of "B" in that course. No course taken for graduate credit may duplicate one taken for undergraduate credit. In no case will a candidate be allowed to continue in the program if he has received "C" or less for seven or more hours of work. Nor will the degree be granted to any student who presents seven or more credits of "C" or less for the degree.

Of the total thirty hours for the M.B.A. degree no more than six hours may be taken outside the School of Business Administration.

Transfer credit from accredited colleges is allowed but is limited to six hours.

A comprehensive examination is required of all candidates. This examination will be taken during the candidate's last semester in the program. Special notice will be given of time and place.

No candidate will be permitted more than six credit hours a term while working at a full-time position.
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 capacities 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 needs of school personnel who are actually engaged in school work in order to:

1. Develop Master Teachers on the elementary and secondary school levels.
2. Enable those teachers with at least one year's successful teaching experience to work toward certification as a school counselor.
3. Enable those 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 the in-service teacher and other professional school personnel 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. ('This Master's program is not to be confused with the fifth year undergraduate program for graduates holding a liberal arts or other non-professional baccalaureate degree which the School of Education has carried for the past several years. The latter
fifth-year undergraduate program simply prepares the candidate for initial teacher certification. For details of this undergraduate program, see University of Dayton Catalog, Program XII "For Non-Professional Degree Holders."

Through sufficient curriculum flexibility, the undergraduate and graduate education of teachers at the University of Dayton represent parts of a carefully planned inter-locking single program. The graduate level of this program simply focuses attention on those needs of an in-service teacher that go beyond his pre-service curriculum.

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 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.
THE MASTER’S PROGRAM IN EDUCATION

Title and Meaning of the Degree:
The title of the Master’s degree to which all three of the indicated programs lead is the MASTER OF SCIENCE IN EDUCATION. Insofar as this degree represents the attainment of a definite and inclusive professional objective, it may be viewed as a terminal degree; i.e., it is not planned as a step toward the doctor’s degree even though the latter may not necessarily be precluded.

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 approval of the North Central Association of Colleges and Secondary Schools and of the State of Ohio, Department of Education.

The programs in School Counseling 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 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 2.500 on hours attempted.

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 "Chairman of the Graduate Committee, School of Education" 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.

**Entrance Examination:**

Either the Graduate Record Examination or the Teacher Education Examination Program 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 Graduate Record Examination is given four times annually at a number of universities including the University of Dayton. Arrangements should be made through the U.D. Guidance Center. Both the Aptitude Test and one Advanced Test should be taken.

The Teacher Education Examination Program is administered directly by the School of Education four times a year. The dates when the TEEP Examinations are scheduled to be given are announced in the calendar of this Bulletin. The fee for the examinations as assessed by the Educational Testing Service, Princeton, New Jersey, is $5.00 per person (This same TEEP is being used as the comprehensive examinations for under-graduate Seniors in partial fulfillment of the requirements for the BACHELOR OF SCIENCE IN EDUCATION Degree.)

The Teacher Education Examination Program consists of the General Professional Examinations and a series of Teaching Field Tests.

The General Professional Examinations have seven discrete tests which are designed to measure the student’s knowledge and understanding of the basic principles in professional education, English usage, and general culture. Other significant factors which contribute to teacher-effectiveness, such as personality and interest in children, are not measured by the examinations. The student takes this group of tests in one session of 185 minutes.

The Teaching Field Tests provide the student with an opportunity to demonstrate certain competencies essential for teaching in a specific field. The time limit for each test is 80 minutes, and the student should take one (preferably in his principal teaching field). The tests are:

- Early Childhood Education
- Elementary School Education
- English Language and Literature
- Social Studies (History-Government included)
- Biological Science
- Physical Science
- Mathematics
French
Spanish
Physical Education
Business Education
Music Education

Early Childhood Education is designed primarily for students preparing to teach kindergarten through third grade. Elementary School Education covers the broad range of elementary education from grade one through eight. The remaining Teaching Field Tests are appropriate for students preparing to teach at the secondary-school level.

It is recommended that students take the General Professional Examinations and at least one Teaching Field Test. This recommendation is based on the belief that all pre-service or in-service teachers should be able to demonstrate reasonable competence with respect to professional knowledge, English usage, and general culture as well as specific competencies in a teaching field.

All of the questions are of the objective multiple-choice type. Examinees mark their answers on a separate answer sheet, using a special electrographic pencil provided by ETS.

Scores on all of the tests will be reported as scaled scores established so as to have a mean of 20 and a standard deviation of 5 for a sample of seniors preparing to teach. Scores will range from approximately 5 to 35.
Admission To Candidacy for Degree:
A student becomes a candidate for the MASTER OF SCIENCE IN EDUCATION degree upon approval of his credentials. At this time the candidate is assigned to an official adviser who will guide the student in his degree program and direct his Field Project.

To receive the approval, the student must meet the following conditions:

a. Application should be filed with the Graduate Committee after the completion of at least the prescribed nine semester hours in the core subjects and after the results of the Graduate Record Examination or of the Teacher Education Examination Program are on record in the student's confidential folder (in Education office).

The most important consideration in the admission of a student to candidacy is the qualitative standard of the student's record in his graduate work. Applicants who are deemed unqualified at this point will be advised to discontinue their program.

b. The applicant must submit the following kinds of evidence, depending on his field of concentration:

(1) Applicants who are pursuing the Master Teacher program must present evidence of at least one year of successful teaching.

(2) Applicants with a concentration in Administration must present evidence of at least three years of successful teaching, a letter of recommendation to the program from an administrator in position to judge the potential ability of the applicant, and must submit to careful screening to guarantee wholesome leadership qualities.

(3) Applicants with a concentration in School Counseling must present evidence of at least one year of successful teaching and must submit to careful screening to guarantee wholesome personal, emotional, and social adjustment. (To facilitate this screening, recommendations of school supervisors and principals under whom the candidate has taught shall be examined together with recommendations of the U. D. Guidance Center through interpretation of appropriate tests.)

c. The applicant must submit either an acceptable Research Paper or an acceptable preliminary plan regarding his Field Project as developed in Edu 503.

Requirements for the Degree:

a. FIELD PROJECT or RESEARCH PAPER Requirement:

PLAN A—Field Project: The Field Project is designed to prepare the candidate as a qualified contributor toward locating and solving problems within a school or school system or within his own teaching or counseling performance. The candidate must give evidence of proficiency in research connected with the solution of an on-the-job problem.

The preliminary plan for the Field Project is prepared in conjunction with Edu 503 Research Methodology and Statistics.
At least ten days before graduation the student must submit three typed copies of his Field Project Report together with an abstract of his Field Project.

Students enrolled in PLAN A are required to complete a minimum of 30 credit hours for the Master of Science in Education degree.

PLAN B—The Research Paper: The Research Paper is done in conjunction with Edu 503 Research Methodology and Statistics and involves less emphasis on the solution of an on-the-job problem done through actual research. The topic under investigation should be related to the student’s area of concentration. It needs to demonstrate:

(1) Power of organization and expression.
(2) Ability to do initial consumer research.
(3) Clarity of thought and conciseness of expression.
(4) Adherence to the standards of form and style as contained in Turabian’s Manual.

Students enrolled in PLAN B are required to complete a minimum of 33 credit hours for the Master of Science in Education degree.

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 oral comprehensive examination conducted by his examining board. This examination covers the whole field of the student’s graduate studies.

This examination may be taken no later than two weeks before graduation.

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 before their admission to candidacy for the Master's degree. In this capacity, he will counsel students with a view toward orienting them in the purposes and requirements of graduate work and will assist them until they are admitted to candidacy and a special adviser is appointed.

PROGRAM OF STUDIES
Core Courses:
To insure proper orientation and a measure of integration in the programs for the MASTER OF SCIENCE IN EDUCATION degree, all candidates must include three core courses which are planned to supply a basic synthesis for the proper guidance of educational theory and practice. These courses are:
Edu 502 Comparative Philosophies of Education ...............three credit hours
Edu 503 Research Methodology and Statistics ...............three credit hours
Edu 504 Advanced Child and Adolescent Psychology ..........three credit hours
or
Edu 501 Advanced Psychology of Learning ...............three credit hours
Area of Concentration:
To insure mastery of a particular area of education, all candidates must include in their programs one of the following areas of concentration:

a. Master High School Teachers.......................... (twelve credit hours)
For high school teachers, concentration must be in an academic field for furtherance of subject-matter mastery in a recognized teaching field.

b. Master Elementary Teachers.......................... (seven credit hours)
For elementary teachers, concentration must be in specified professional education courses, as follows:
Edu 511 Elementary School Curriculum ......................... two credit hours
Edu 522 Principles and Techniques of Guidance .............. three credit hours
Edu 520 Psychology of Individual Differences ................. two credit hours
(Teachers who wish to move from elementary teaching to high school teaching should follow the Master High School Teacher Program.)

c. School Counseling Program............................ (sixteen credit hours)
Concentration must include:
Prerequisite: Edu 448 Psychodynamics of Behavior .............. three credit hours
(or a combination of undergraduate courses in Mental Hygiene and Abnormal Psychology).
Edu 522 Principles and Techniques of Guidance .................................. three credit hours
Edu 523 Occupational Information and Community Resources .... two credit hours
Edu 533 Psychometrics ................................................................. three credit hours
Edu 535 Practicum I: Test Interpretations and Case Studies .... two credit hours
Edu 543 Principles and Techniques of Counseling .................. three credit hours
Edu 545 Practicum II: Counseling Techniques ......................... three credit hours
d. School Administration Program:
(1) Elementary School Principal ...................................................... (thirteen credit hours)
Edu 506 School Administration ...................................................... three credit hours
Edu 509 School Supervision ........................................................... three credit hours
Edu 511 Elementary School Curriculum ....................................... two credit hours
Edu 513 Elementary School Evaluation ......................................... two credit hours
Edu 522 Principles and Techniques of Guidance .................... three credit hours
(2) Secondary School Principal ...................................................... (thirteen credit hours)
Edu 506 School Administration ...................................................... three credit hours
Edu 509 School Supervision ........................................................... three credit hours
Edu 512 Secondary School Curriculum ......................................... two credit hours
Edu 514 Secondary School Evaluation ......................................... two credit hours
Edu 522 Principles and Techniques of Guidance .................... three credit hours
(3) Executive Head ................................................................. (seventeen credit hours)
Edu 506 School Administration ...................................................... three credit hours
Edu 509 School Supervision ........................................................... three credit hours
Edu 511 Elementary School Curriculum ....................................... two credit hours
Edu 512 Secondary School Curriculum ......................................... two credit hours
Edu 515 School Law ................................................................. two credit hours
Edu 517 School Finance ........................................................... two credit hours
Edu 518 School and the Social Order ........................................... three credit hours
(4) Supervisory ................................................................. (fourteen credit hours)
Edu 509 School Supervision ........................................................... three credit hours
Edu 511 Elementary School Curriculum ....................................... two credit hours
Edu 512 Secondary School Curriculum ......................................... two credit hours
Edu 513-14 Elementary or Secondary School Evaluation ........ two credit hours
Edu 518 School and the Social Order ........................................... three credit hours
Edu 530 Psychology of Individual Differences ....................... two credit hours

Electives:

To round out the candidate's needs in line with the major purpose to be served through the Master's degree, the candidate may elect under advisement sufficient credit hours of pertinent course work to bring total to the minimum requirement for the degree.
a. Master High School Teachers:
Elective courses should preferably be selected from the student's teaching field or allied fields; they may also be selected with the approval of the adviser from courses in general education or professional education.

b. Master Elementary Teachers:
The student is directed into such a selection of courses as would best serve to complete his pre-service curriculum and to give him the professional skills needed. Consequently these twelve elective hours may be selected from one of the following three areas or a combination thereof: (1) a departmental subject-matter field to follow through on an area of academic concentration; (2) courses from one or more graduate academic departments to fulfill a broadening of general education; (3) or professional education courses.

c. School Counseling Program:
May be selected from the following:
Edu 530 Psychology of Individual Differences .................................... two credit hours
Edu 534 Interpretation of Individual Tests ........................................... two credit hours
Edu 539 Administration of a School Guidance Program .......................... two credit hours
Edu 547 Psychology of Exceptional Children ......................................... two credit hours
Edu 550 Reading Problems and the Guidance Program ............................ two credit hours

d. School Administration Program:
Future administrators are advised to elect additional credit hours from the following:
Edu 515 School Law ................................................................. two credit hours
Edu 517 School Finance ............................................................. two credit hours
Edu 518 School and the Social Order ................................................ three credit hours
Edu 522 Principles and Techniques of Guidance ................................. three credit hours
Edu 521 School Public Relations ..................................................... two credit hours
Edu 530 Psychology of Individual Differences .................................... two credit hours
Edu 539 Administration of a School Guidance Program ........................ two credit hours
Edu 533 Psychometrics ..................................................................... three credit hours
Edu 543 Principles and Techniques of Counseling ................................. three credit hours
Edu 547 Psychology of Exceptional Children ....................................... two credit hours
Eco 501 Advanced Principles of Economics ........................................ three credit hours

Field Project or Alternate:

a. For students enrolled in PLAN A:
Edu 590 Field Project ................................................................. three credit hours

b. For students enrolled in PLAN B:
Additional pertinent electives to bring total to the minimum of thirty-three credit hours.
School of Engineering

FOREWORD

Graduate work in engineering is available on a late afternoon, early evening basis. This schedule of offerings will be continued and additional day classes will be scheduled in the future. Likewise, the course offerings and degree programs will be enriched and expanded as time passes and the needs of students can be met. This program is designed primarily for two broad categories of students: (1) those who are professionally employed on a full-time basis in the area and who wish to pursue further study; and (2) recent graduates who wish to increase their mastery of the field by doing advanced work. Specific programs in some or all of the several engineering disciplines—chemical, civil, electrical, industrial, management, mechanical, sanitary, etc.—will be developed in the future as the needs of students are recognized and as the resources of the University will permit.

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 program leading to the Master of Science in Engineering degree is designed primarily to meet the basic needs of the engineer in a changing world. Major emphasis is placed upon rigorous study of the engineering sciences in order to improve the individual’s competence to deal with the increasingly complex body of knowledge underlying all engineering design, development, and research. Such emphasis also tends to increase the breadth of his fundamental knowledge and give him a greater flexibility and adaptability in dealing with tomorrow’s unknowns. To this end emphasis is placed upon the problems common to all engineering disciplines. It is hoped that
with this program the School of Engineering may lead the individual to his highest level of scholarship and stimulate him to achieve a genuine personal and professional maturity.

RESEARCH FACILITIES

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

Some of the more important research facilities are one medium- and two large-scale digital computers, analog computer facilities and a sub-critical nuclear reactor.

GRADUATE APPOINTMENTS

Industrial Fellowships and certain special research grants are available at the University of Dayton for the encouragement of graduate work and the promotion of research.

Detailed information and forms for making application may be secured from the Dean of the School of Engineering.

GRADUATE STUDY BY MEMBERS OF THE STAFF

Any member of the research or instructional staffs, subject to the approval of the head of his department or section, may carry not more than six credits of graduate work per semester.

Staff members holding the rank of professor or associate professor cannot become candidates for degrees from this institution. Staff members holding the rank of instructor or assistant professor may become candidates for degrees with the approval of the Dean of Engineering.
ADMISSION

Procedure:

a. All students desiring admission to the graduate program of the School of Engineering must file a formal Application for Admission to Graduate Study in Engineering.

Qualifications:
There are certain basic requirements which must be met by all applicants. These include the following:

a. Bachelor's degree in engineering from an institution having curricula accredited by the Engineers’ Council for Professional Development.
b. A cumulative grade point average of 3.00 for the last two years of undergraduate curriculum. This is based upon a grading system in which A = 4.00.
c. Exceptions to the above requirements will be considered on an individual basis by the Graduate Study Committee of the School of Engineering.
TIME LIMIT
The program must be completed within five years after admission to candidacy. (Period of service in the armed forces is not included.)

PLANNING GRADUATE STUDY
The major objectives of graduate study are scholastic competence, independence and maturity of thought. The student must accept responsibility for his own education and should master those aspects of learning which will give him confidence in his own judgments.

THE MASTER'S PROGRAM IN ENGINEERING
The Dean of the School of Engineering will appoint a student advisory committee for each Regular Student admitted to graduate study. Working with this committee, each student will develop a program of study which is deemed best for his particular interests and objectives and which is recommended by the committee chairman. The student then must file this program of study with and secure the approval of the Graduate Study Committee of the School of Engineering.

Credits:
Each program of study must include a minimum of 33 credit hours consisting of:
   a. 6-9 credit hours in Basic Sciences;
   b. 12 credit hours in Engineering Sciences;
   c. 3 credit hours in Philosophy;
   d. 3-6 credit hours in Thesis Related Topics approved by the student’s advisory committee;
   e. 6 credit hours on an approved thesis project.
A graduate student may not change from one major to another without written permission from the Graduate Study Committee, School of Engineering, and the Dean of Engineering.

Courses:
   a. Basic Sciences
      6-9 credit hours selected from the following courses:
      *Mth 401   Phy 505   Chm 508
      *Mth 402   Chm 507
   b. Engineering Sciences:
      12 credit hours selected from the following courses:
      Egr 501 Applied Elasticity ................................three credit hours
      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

c. Philosophy
Egr 522 Phil. Found. of Eng. ..........................................................three credit hours

*These courses not included in the restriction placed upon the use of Advanced Undergraduate courses in the graduate program, page 12.

d. Thesis Related Courses:
3-6 credit hours in courses approved by the student’s advisory committee.

e. Thesis:
6 credit hours on an approved research project.

Comprehensive Examination and Admission to Candidacy:
The student must satisfactorily pass a comprehensive examination before he is granted admission to candidacy for the degree. The examination may be written, oral or both. This examination may be taken after the student has completed 18 or more credit hours of graduate class work with a cumulative grade point average of 3.00 or better. The student’s advisory committee administers the examination.

Application for Admission to Candidacy:
An application for comprehensive examination and admission to candidacy may be obtained from the Office of the Dean of Engineering. This form must be filled out and filed in that office at least four weeks prior to the date requested for the examination.

Thesis:
Presentation of a thesis is required of all candidates. Joint authorship is not permitted. Copies of the completed thesis must be in the hands of the student’s advisory committee and the librarian for approval two weeks prior to the date fixed for the final oral thesis examination. After the final oral examination, two complete and approved typewritten copies of the thesis shall be deposited with the librarian. These copies of the thesis must be deposited not less than two weeks prior to commencement. A charge of $10.00 will be made to cover library costs and binding.

The student should consult the University of Dayton Thesis Manual, prepared for use of students in the Engineering Graduate School, before arranging for the typing of his thesis.

When students do their thesis research at their place of employment, emphasis will be placed on the observance of confidential aspects of research projects. When requested, arrangements will be made to delay public disclosure of theses, or their subject matter, for any reasonable time to permit filing of patents or taking any other measures to protect the rights of the employer to the findings in the project.
Final Oral Thesis Examination:
An application for final oral thesis examination may be obtained from the Office of the Dean of Engineering. This form should be filled out and signed by the Chairman of the student's advisory committee and filed in the Office of the Dean of Engineering at least two weeks prior to the date requested for the oral examination.

Degrees:
The School of Engineering at the present time offers one graduate program of study leading to the degree Master of Science in Engineering. The requirements for this degree are outlined as follows:

a. Obtain admission to candidacy.

b. Complete a prescribed program of study with a minimum of thirty-three credit hours of which at least twenty-four credit hours must be with grades of "A" or "B." 

c. Earn a cumulative grade point average of 3.00 or better.

d. Submit an acceptable thesis.

e. Satisfactorily pass an oral thesis examination.

In fulfilling the requirements for the degree, certain specific conditions prevail and should be noted carefully by the student. These are itemized as follows:

a. Credits in Transfer
   Transfer credit is determined on an individual basis by the committee charged with this responsibility.

b. Course Load
   Any person who is not a full-time student may register for more than six credit hours per term only with permission of the Graduate Study Committee.

c. Use of Advanced Undergraduate Courses
   Certain undergraduate level courses may be used if approved by the student's advisory committee.
Departments of Instruction

**Biology (Bio)**

Any of the 300-400 courses listed may be taken for graduate credit under the usual conditions.

- **Bio 303. Physiology**
- **Bio 304. Histology**
- **Bio 309. Microtechnique**
- **Bio 312. General Genetics**
- **Bio 316. Plant Morphology**
- **Bio 320. Evolution**
- **Bio 324. Entomology**
- **Bio 325. Parasitology**
- **Bio 330. Plant Physiology**
- **Bio 361. Invertebrate Zoology**
- **Bio 407. Embryology**
- **Bio 410. Radiation Biology**
- **Bio 411. General Bacteriology**
- **Bio 412. Human Genetics**
- **Bio 416. Pathogenic Bacteriology**
- **Bio 454. Neuroanatomy**

- **Bio 501. Seminar**
  Practice in development, presentation, and discussion of papers dealing with Biological problems. Open only to advanced undergraduate and graduate Biology Majors.

- **Bio 503. Advanced Genetics**
  An analysis of the nature of the gene and gene action. The course will review recent advances in biochemical and physiological genetics, cytogenetics, population genetics and radiation genetics.

**Dr. George B. Noland, Chairman**
Bio 504. Bio-Lab Techniques
Three Credit Hours
Designed to acquaint teachers with lecture demonstration skills and laboratory techniques applied to the biological sciences. The course will present methods of collecting, preserving, and preparing biological materials for classroom use.

Bio 505. Protozoology
Three Credit Hours
A study of the protozoa, their structure and physiology, their importance in experimental biology and their relation to other micro-organisms.

Bio 507. Endocrinology
Three 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.

Bio 508. Field Biology
Three Credit Hours
The course is designed to acquaint the student with the local flora and fauna. Field trips will be used to apply techniques in the observation and study of organisms in their natural environment.

Bio 510. 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.
Bio 511. Cellular Physiology  
The concepts of structure, physiology and bio-chemistry of cells and subcellular aggregations will be studied. Emphasis will be placed on the mechanisms of energy transfer, membrane phenomena and enzyme activity.

Bio 513. Mycology  
Biology of the fungi and slime molds. Lecture will deal with the taxonomy, morphology, cytology, physiology and genetics of the fungi. Laboratories will deal with morphological, growth and experimental studies.

Bio 515. Bacterial Physiology  
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.

Bio 520. Principles of Biology  
This course is specifically designed as an introduction to modern biology. This is a background course open only to graduate students registered in the Master Teacher Program.

Bio 590. Pro-Seminar or Phi 505 Inter-Disciplinary Seminar  
The relevance of science to all other knowledge; problems dealing with the interrelations of science, Philosophy, Education and Government.

Bio 599. Thesis  
THREE-SIX CREDIT HOURS
Business (MBA)

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 organization, 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 with 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
Planning, organization, integrating and measuring the marketing effort. The management of the marketing functions of business. The managerial problem in the distribution, supervision, and control of marketing. Extensive use of the case method and current materials.

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 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  
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  
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  
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  
The purposes of this course are to study the development of a personal philosophy and a philosophy of business.  
*Required of all students.

MBA 580. Human Relations in Industry  
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 599. Business Policies and Administrative Management  
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. Cletus Chudd, 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 412. Intermediate Organic Chemistry  
Prerequisite: One year of Basic Organic Chemistry.

*CHM 417. Inorganic Chemistry  
Prerequisite: Chm 215 Quantitative Analysis, or the equivalent.

*CHM 501. Principles of Chemistry I  
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  
The subjects treated in this course are: thermodynamics, chemical kinetics, redox reactions, organic chemistry (nomenclature, functional groups, preparation and properties or organic compounds). Prerequisite: Chm 501.
CHM 503-504. Advanced Inorganic Chemistry
Current views on atomic theory and atomic structure, chemical bonding, periodic properties of the elements, inorganic nomenclature, coordination compounds, acid-base systems, nuclear chemistry, properties and compounds of families of elements.

CHM 505-506. Advanced Organic Chemistry
Molecular orbital and resonance theories, conformational analysis, stereo-chemistry, correlation of molecular structure with physical and chemical properties, reaction mechanisms, heterocyclic chemistry.

CHM 507-508. Advanced Physical Chemistry
Classical thermodynamics with emphasis on non-ideal systems and chemical reactions. Introductory quantum theory, chemical bonding and the structure of molecules. Chemical kinetics, empirical kinetics and reaction mechanism, absolute reaction rate theory.

CHM 510. Pro-Seminar
The impact of Chemistry on present-day society; sociological, economical, and ethical factors. Phl 505 may be substituted for Chm 510.

CHM 511. Biochemistry
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.

CHM 512. Special Techniques in Biochemistry
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 514. Advanced Analytical Chemistry
Theoretical topics of analytical Chemistry, particularly as applied to electrical and optical methods of instrumental analysis.

CHM 520-521. Research
Six credit hours
Economics (Eco)

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.
Education (EDU)  
Dr. Louis J. Faerber, S.M., Dean

EDU 325. Social Studies in the Elementary School  
three credit hours

EDU 431. Visual and Other Sensory Aids in Education  
two credit hours

EDU 448. Psychodynamics of Behavior  
three credit hours
Prerequisites: This course replaces the previous prerequisites of Mental Hygiene and Abnormal Psychology for the Guidance and Counseling Program; students who have already completed this dual requirement on the undergraduate level should not take this course.

EDU 451W. Advanced Kindergarten-Primary Instruction  
three credit hours
Prerequisite: Edu 219 Kindergarten Instruction or equivalent.

EDU 480. The Psychology of Slow Learning Children  
two credit hours
Enrollment limited to teachers with positions (or prospective positions) in special education.

EDU 484. Language Arts for Slow Learning Children  
two credit hours
Prerequisite: Edu 480.

EDU 485. Social Studies for Slow Learning Children  
two credit hours
Prerequisite: Edu 480.

EDU 486. Arithmetic for Slow Learning Children  
two credit hours
Prerequisite: Edu 480.

EDU 487. Occupational Orientation and Job Training  
two credit hours
A course in special education for teachers of slow learning children. Prerequisite: Edu 480.

EDU 500W. Mathematics in Elementary Grades  
two credit hours
A graduate workshop designed to produce college teachers and school supervisors of the Individualized Arithmetic Program. Demonstration of how the logical patterns of mathematical thought which are inherent in arithmetic can be readily acquired by pupils. Prerequisite: Completion of a Level One Workshop, one year's experience in teaching the Individualized Arithmetic Program, and the imminent prospect of teaching the Individualized Arithmetic Program to teachers.

EDU 501. Advanced Psychology of Learning  
three semester hours
Major theories of learning and current issues in the principal areas of the psychology of learning, e.g., transfer of training.

EDU 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: Edu 419 Philosophy of Education, or equivalent where the student has already achieved a norm for evaluating the theories of modern education.

EDU 503. Research Methodology and Statistics  
three credit hours
Comprehension of educational statistics and terminology of research. Major techniques and methods of research for intelligent consumption. Specific techniques and guides for efficiently locating research on a given problem, reading critically, and drawing logical inferences. Prerequisite: One of the other core courses, i.e., Edu 501 or Edu 502 or Edu 504.
EDU 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.

EDU 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.

EDU 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. Prerequisite: Admission to graduate standing in the School of Education.

EDU 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.

EDU 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.

EDU 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.

EDU 513. ELEMENTARY SCHOOL EVALUATION  TWO CREDIT HOURS
Centers attention on systematic, total school self-evaluation as the basis for school improvement programs.

EDU 514. SECONDARY SCHOOL EVALUATION  TWO CREDIT HOURS
Centers attention on systematic, total school self-evaluation as the basis for school improvement programs.

EDU 515. SCHOOL LAW  TWO CREDIT HOURS
Problems in school administration which may give rise to court action. Ohio school law will be emphasized.

EDU 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.

EDU 518. SCHOOL AND THE SOCIAL ORDER  THREE CREDIT HOURS
The relationship of 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.
EDU 521. SCHOOL PUBLIC RELATIONS  
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.

EDU 522. PRINCIPLES AND TECHNIQUES OF GUIDANCE  
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.

EDU 523. OCCUPATIONAL INFORMATION AND COMMUNITY RESOURCES  
Selection, utilization, and evaluation of educational and occupational information materials. Familiarization with standard labor market data and resources of the local community.

EDU 527W. BUSINESS SYSTEMS AND DATA PROCESSING  
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.

EDU 530. PSYCHOLOGY OF INDIVIDUAL DIFFERENCES  
Nature, extent, and significance of variability; hereditary and cultural influences; theories of intelligence; trait organization; group differences.

EDU 533. PSYCHOMETRICS  
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. Prerequisites: Edu 448, 503.

EDU 534. INTERPRETATION OF INDIVIDUAL TESTS  
Intensive study of major theoretical problems concerning the use and interpretation of individual psychological tests. Particular attention is devoted toward interpretation of the Stanford-Binet, Wechsler Intelligence Scale for Children, the Bender Gestalt, and projective techniques. Emphasis is placed upon use of individual test results in the counseling program. Prerequisite: Edu 533.
EDU 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: Edu 522, Edu 533.

EDU 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.

EDU 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: Edu 448, 503, 533.

EDU 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. Guidance Center facilities will be utilized as a training center. Prerequisites: Edu 533, 543. Recommended: Edu 523.

EDU 547. Psychology of Exceptional Children  Two credit hours
Deals with the intellectual deviate, the socially and emotionally maladjusted. Concentration on educational guidance for the gifted and the mentally retarded. Prerequisites: Edu 448, Psy 306 or Edu 207.

EDU 550. Reading Problems and the Guidance Program  Two credit hours
Understanding the nature of the problem. Practicum in diagnostic and remedial reading.

EDU 551, 552, 553, 554, 555, 556. Child Study Project  One credit hour
One graduate credit per semester with a maximum of six credits in this series. These courses involve the direct study of children throughout the school year. Each participant gathers a wide body of information about a pupil, presents the accumulated data from time to time to the study group for underlying the child's behavior, learning, and development. Provides opportunity for teachers in service to earn credit for participation in their own local child study group. The study sessions meet 18 times a semester. (These projects must be registered for in sequence and they yield one semester hour per project per semester.)

EDU 558W. Child Study Leadership Workshop  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.

EDU 560. Library Guidance for Teachers  Two credit hours
Trains the teacher to make use of the available services and resources of the standard school library in behalf of a well-rounded education for pupils. Acquaints the class with library organization, reference material, indexes, and bibliography. Not designed for teacher-librarians.
EDU 561W. COMMUNITY RESOURCES IN ELEMENTARY TEACHING
This workshop aims to give elementary teachers background for their teaching (particularly in the social studies area) by taking them behind the scenes in local government, social agencies, key industrial plants, and historical sites. Dayton and the Miami Valley will be the laboratory.

EDU 562. SCHOOL PROVISIONS FOR INDIVIDUAL DIFFERENCES three credit hours
Studies the different traits and abilities of pupils and ways whereby teaching might be adjusted to these differences. Special attention focused on the slow learner, the gifted student, and the educationally retarded child.

EDU 563. DIAGNOSIS AND REMEDIAL READING three credit hours
A study of the major factors associated with reading difficulties, techniques that might be used to diagnose the nature and causes of pupil difficulty, and the methods by which remedial adjustments can be made. Demonstrations and directed observation of teaching. Prerequisite: Edu 303 Reading in the Elementary School or 320 Reading and Language Arts in Elementary School.

EDU 564. ADVANCED SCIENCE IN ELEMENTARY SCHOOL three credit hours
This 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: Edu 460W Science in the Elementary School or another college course in physical science.
Edu 565. Group Techniques in the Classroom
A comprehensive study will be made of classroom grouping in both primary and intermediate areas of the elementary school. A practical approach is planned for the study of all phases of grouping; initial class appraisals, deciding individual needs, class grouping, manipulation of social differences, and planning for effective group instruction; homogeneous and heterogeneous grouping; also a unique plan of random grouping will be presented.

Edu 566W. The Education of Gifted Children
The workshop will deal with formal and informal methods of identifying giftedness, the potentials and problems of the gifted, assessment of special school programs, and positive provisions for the instructional program.

Edu 570W. Criteria for the Evaluation of Catholic Elementary Schools
A workshop designed for Catholic school administrators selected by the Elementary School Department, National Catholic Educational Association, for eventual publication of an Evaluative Criteria for Catholic Elementary Schools.

Edu 571W. Use of the Criteria for Evaluation of Catholic Elementary Schools
This workshop is designed to enable Catholic school administrators to engage in depth studies relative to the evaluative criteria formulated in Edu 570W. The Participants will engage likewise in discovering ways and means of implementing the criteria in their own schools or school systems.

Edu 590. Field Project
An on-the-job research project that investigates a problem that stems from an actual need for the purpose of effecting improvement of either one's own professional practice or of the school setting in which the investigator works. It is accompanied by a seminar session on the campus held once a week. Prerequisite: Admission as a candidate for a degree.
Chemical Engineering (CME)  
Dr. Michael Bobal, Chairman

CME 501. **Advanced Thermodynamics**  
Two Credit Hours  
Advanced topics of thermodynamics with applications. Prerequisite: Cme 303 or equivalent. (Open for enrollment of undergraduate students.)

CME 502. **Fluid Flow**  
Two Credit Hours  
A study of compressible and incompressible flow with applications. Prerequisite: Cme 311 or equivalent. (Open for enrollment of undergraduate students.)

CME 503. **Advanced Unit Operations**  
Two Credit Hours  
This course covers diffusional topics, including extraction and multi-component absorption. Prerequisite: Cme 312 or equivalent. (Open for enrollment of undergraduate students.)

CME 504. **Heat Transmission**  
Two Credit Hours  
A study of the basic concepts of the flow of heat by conduction, convection and radiation. Prerequisite: Cme 311 or equivalent. (Open for enrollment of undergraduate students.)

Civil Engineering (CIE)  
Seymour J. Ryckman, Chairman

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 504. **Limit Design in Steel**  
Three Credit Hours  
A review of the physical properties of metal, the theory and application of limit design to simple and redundant members, trusses, and columns. A brief study of connection details. Corequisite: Cie 406. (Open for enrollment of undergraduate students.)

CIE 506. **Ultimate Design of Reinforced Concrete**  
Three Credit Hours  
The theory and application of ultimate design in reinforced concrete as applied to the sections of beams, columns and members subject to both bending and direct stress. The latest report of the A.S.C.E.-A.C.I. Joint Committee is reviewed. Prerequisite: Cie 407. (Open for enrollment of undergraduate students.)

CIE 524. **Foundation Design**  
Three Credit Hours  
Analysis of earth pressure and stability of natural slopes. Study of frost action, permafrost. The design of spread foundations, pile foundations, caissons, cofferdams, anchored bulkheads, bridge piers and abutments. Prerequisite: Cie 409; Corequisite: Cie 407. (Open for enrollment of undergraduate students.)

CIE 542. **Highway Design I**  
Three Credit Hours  
Design and construction of pavements, including concrete, asphalt, aggregate and soil cement surfaces. Designs of base courses. Maintenance. 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.)
Electrical Engineering (ELE)

Bro. Louis Rose, S.M., Chairman

ELE 502. Advanced Circuit Analysis
Three credit hours

ELE 503. Analog Computers
Three credit hours
The discussion and analysis of linear electrical computing elements in conjunction with electronic differential analysis. The utilization of electrical and electronic circuits for the performance of linear operation, for multiplication and division, and for function generation. Use of differential analyzers for solving linear integral-differential equations, simultaneous linear algebraic equations, and non-linear differential equations. Prerequisite: Ele 313, Math 342. (Open for enrollment of undergraduate students.)

ELE 504. Digital Computers
Three credit hours

ELE 511. Advanced Theory and Design of Rotating Machinery I
Three credit hours
Basic principles and applied theory in practical design of induction machinery, commercial, aircraft and missile types. Prerequisite: Ele 403. (Open for enrollment of undergraduate students.)

ELE 512. Advanced Theory and Design of Rotating Machinery II
Three credit hours
Detailed theory and design of direct current and synchronous machines. Permanent magnet and flux switch machines. Heat transfer phenomena; the general temperature field. Prerequisite: Ele 511. (Open for enrollment of undergraduate students.)
Engineering (EGR)

EGR 501. Applied Elasticity
First Term, Odd Years

EGR 502. Mechanics of Fluids
Fluid properties, important differential equations in fluid flow, laminar and turbulent flow, boundary layer flow, introduction to compressible flow.  
First Term, Even Years

EGR 503. Thermodynamics
Thermodynamic concepts; the laws of thermodynamics; kinetic theory of gases; introduction to the Maxwell-Boltzmann statistics and their applications.  
First Term, Odd Years

EGR 504. Mass and Energy Transport
Basic concepts, principles and definitions, rate equations, thermodynamic principles, applications.  
Second Term, Odd Years

EGR 505. Properties of Materials
Structure, properties, and behavior of materials. Conductivity, diffusivity, electro-chemistry, elasticity, plasticity, fracture, viscosity.  
First Term, Odd Years

EGR 506. Solid State Devices
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.  
Second Term, Odd Years

EGR 512. Reliability
Application of statistical theory to the design of reliability systems in the broadest sense. Theory behind, and techniques to be used in designing testing methods and procedures for determining reliability of component parts and total systems. Environmental test design. Statistical analysis of, and inference from test results. Prerequisite: Mth 331.  
First Term, Odd Years

EGR 513. Systems Analysis, Design & Evaluation
A total systems approach to problem solving. This course considers techniques which treat quite sophisticated and difficult problems. Proofs and the characteristic rigor of mathematics are avoided but the essential subtlety of the techniques remain. This course relates mathematical courses on the one hand and applied engineering courses on the other. Prerequisite: Egr 512.  
Second Term, Odd Years

EGR 516. Modern Electron Devices
Attention is directed toward late developments in electronic devices exclusive of transistors and conventional electron tubes. Some specific topics include low noise traveling wave tubes, parametric amplifying devices, and several devices from the area of quantum electronics. Stress is placed on basic physical principles and theory of operation. Prerequisites: Mth 421, Mth 422, Phy 505 or equivalent.  
Second Term, Odd Years

EGR 517. Transport Properties
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. Prerequisites: Mth 421, Mth 422, Egr 504.
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. Prerequisites: Mth 421, Mth 422, Egr 502.

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 301.

EGR 520. ADVANCED STRUCTURAL ANALYSIS
Three Credit Hours
Methods of moment-areas, slope-deflection, moment distribution, column analogy, and virtual work. Includes consideration of such problems as frames of variable cross section, plates and shells, and space frames. Prerequisites: Egr 302.

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 407.

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 Phi 505.)

EGR 525. AUTOMATIC CONTROL THEORY
First Term, Odd Years
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
Zero to 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 gages. 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 gages, photoelasticity, and brittle coatings in stress analysis. Corequisite: Egm 501.

English (ENG) Dr. B. J. Bedard, Chairman

Any 400 upper 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. English 516 is not 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. English 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.
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<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>*ENG 536</td>
<td>Studies in Drama to 1642</td>
<td>THREE</td>
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<td>A survey of English drama from the beginning to the closing of the theatres.</td>
<td>CREDIT HOURS</td>
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<td>*ENG 538</td>
<td>Studies in Milton</td>
<td>THREE</td>
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<td>A treatment of the major and minor poems and related prose of Milton.</td>
<td>CREDIT HOURS</td>
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<tr>
<td>*ENG 542</td>
<td>Studies in Eighteenth Century Literature</td>
<td>THREE</td>
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<td>A study of the writers of the Augustan, Post-Augustan, and Pre-Romantic Ages.</td>
<td>CREDIT HOURS</td>
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<tr>
<td>*ENG 546</td>
<td>Studies in the Novel</td>
<td>THREE</td>
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<td>A consideration of the development and characteristic forms of the novel.</td>
<td>CREDIT HOURS</td>
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<td>*ENG 552</td>
<td>Studies in Romanticism</td>
<td>THREE</td>
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<td>The nature and progress of English Romanticism as revealed in the principal poets of the early part of the Nineteenth Century.</td>
<td>CREDIT HOURS</td>
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<td>*ENG 556</td>
<td>Studies in Nineteenth Century Literature</td>
<td>THREE</td>
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<td>A treatment of the significant poets and essayists of the Victorian Age.</td>
<td>CREDIT HOURS</td>
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<td>*ENG 562</td>
<td>Studies in Twentieth Century Literature</td>
<td>THREE</td>
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<td>A study of significant movements, forms, and writers in the literature of the Twentieth Century.</td>
<td>CREDIT HOURS</td>
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<tr>
<td>*ENG 566</td>
<td>Studies in Drama Since 1660</td>
<td>THREE</td>
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<td>A selective study of significant developments in drama from the Restoration to the present.</td>
<td>CREDIT HOURS</td>
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<tr>
<td>ENG 572</td>
<td>Transcendentalism in Nineteenth Century American Literature</td>
<td>THREE</td>
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<td>A consideration of the writers of the Romantic Age in America.</td>
<td>CREDIT HOURS</td>
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<tr>
<td>*ENG 576</td>
<td>Major American Writers</td>
<td>THREE</td>
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<td>An intensive comparative study of two or three American writers considered in depth.</td>
<td>CREDIT HOURS</td>
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</table>
*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  three credit hours
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.

Eng 599. Thesis  three-six credit hours

History (Hst)  
Dr. Wilfred 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 as a historical science, with its own method and objectives. Some familiarity with historical method will be required in the composition of research papers.

Hst 501. Greek and Roman Civilization  three credit hours
This course seeks to understand life in Ancient Greece and Rome. The method of inquiry is comparison and contrast: first between Athens and Sparta, the focal points of the Hellenic era, and then between the republican and imperial periods of Rome. In each case, Hellenic and Rome, the course probes economic, social, religious, and cultural forces. A general knowledge of Ancient History is presupposed.

Hst 505. Great African States  three credit hours
—An intensive study of highly developed civilizations of medieval and early modern Africa. Stress will be placed on the empires of Ghana, Mali, Songhay, Ethiopia and Zanj.

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 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 528. SOVIET UNION SINCE 1917  
Three credit hours  
A comprehensive analysis of Soviet Russia from the Revolution of 1917 to the present day. Concentration will be on the political, economic (including the impact of science and technology), and social aspects of the Soviet nation. Treatment will also be given to the full range of Soviet foreign relations and ideology.

HST 531. THE CIVILIZATION OF THE FAR EAST  
Three credit hours  
The purpose of this course is to acquaint the student with the cultural, religious, social, and economic development of the Far East. A general knowledge of World History is presupposed.

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 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  
The course in the Philosophy of History will be concerned primarily with the speculative historical writing—i.e., the study of the principal philosophers of history beginning with Greek antiquity and including St. Augustine, Hegel, Marx, Spengler, and Toynbee.

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 555. THE IMMIGRANT IN AMERICA  
Three credit hours  
A study of the various immigrant groups that combined to establish the distinctive features of American civilization. Attention will be focused on the contributions of the nationality groups in the development of our social, economic, political, cultural, and religious institutions. A general knowledge of American History is presupposed.

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 580. HISTORY OF THE LABOR MOVEMENT IN THE U.S.  
Three credit hours  
After a brief survey of classic instances of early labor organization from the 1790's through the 1850's, a major attention is given to the conditions of labor in the post-Civil War United States and the movement toward national organization of labor. Thereafter, discussion turns to the economic, political, social, and intellectual emphases and programs of national labor organizations in the environment of late 19th century and 20th century United 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 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

Mathematics (Mth)

Dr. Kenneth C. Schraut, Chairman

Mth 411. Probability and Statistics I three credit hours
Prerequisite: Mth 202 or 218

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 202 or 218

Mth 422. Advanced Calculus II three credit hours
Prerequisite: Mth 421

Mth 432. Fourier Series and Boundary Value Problems three credit hours
Prerequisite: Mth 422

Mth 461. Introduction to the Theory of Functions of a Complete Variable three credit hours
Prerequisite: Mth 422

Mth 465. Modern Operational Mathematics three credit hours
Prerequisite: Mth 202 or 218

Mth 471. Topology three credit hours
Prerequisite: Mth 422

The courses marked with an asterisk are intended primarily for graduate students in Education. Prerequisite for enrolling in any of these courses for graduate credit toward the M.S. in Education degree is standard teacher certification in Mathematics with at least 21 semester hours in Mathematics.

*Mth 501-502. Fundamental Concepts of Algebra six credit hours
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 the several curriculum revision groups.
*MTH 503-504. FUNDAMENTAL CONCEPTS OF GEOMETRY
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 notations. An intensive study of the relation of these topics to the topics of high school geometry as proposed by the several curriculum revision groups.

*MTH 505-506. FUNDAMENTAL CONCEPTS OF PROBABILITY AND STATISTICS
Topics to be discussed include: the basic laws of probability, frequency distribution (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 the several curriculum revision groups.

*MTH 507. FUNDAMENTAL CONCEPTS OF ANALYSIS
This course will include the concepts of number, sequence, function, limit, continuity, derivative, integral, and infinite series, as well as their relation to the material in the high school curriculum.

*MTH 508. INTRODUCTION TO APPLIED ANALYSIS
A survey of the application of differential equations and infinite series to classical problems in physics, science, and engineering.
*MTH 510. Theory and Practice of Computer Programming  three credit hours
A study of the universal compilers agol and cobol, followed by a survey of the computer solution of selected problems taken from science, technology, and business. Attention will be given to the analysis of errors.

MTH 521-522. Real Variables I  three credit hours each semester
Sets and relations, cardinal numbers, order types and ordinals, the real number system and metric spaces, functions and sequences of functions. Prerequisite: Mth 422.

MTH 525-526. Complex Variables  three credit hours each semester
Fundamental concepts, integral theorems, series and the expansion of analytic functions in series, singularities. Entire functions, meromorphic functions, analytic continuation, conformal representation. Prerequisite: Mth 521.

MTH 531-532. Advanced Differential Equations  three credit hours each semester

MTH 535. Partial Differential Equations I  three credit hours

MTH 536. Partial Differential Equations II  three credit hours
The wave equation, Laplace's equation, some problems in the conduction of heat, motion of viscous fluids, the hodograph method. Numerical solutions and existence theorems related to these methods. Prerequisite: Mth 535.

MTH 541-542. Operational Methods  three credit hours each semester
The operational methods frequently used in applied mathematics are studied including the Laplace and other Fourier transformations. The concept of involution is used to develop the theory. The inversion integral and applications to ordinary and partial differential equations are discussed. Prerequisite: Mth 422, 461, and preferably 432 and 465.

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 theory 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 semester

MTH 555-556. Advanced Numerical Analysis  three credit hours each semester
to programming the methods studied for a high speed digital computer. Prerequisite: Consent of Instructor.

**MTH 561. ABSTRACT ALGEBRA**

Semi-groups and groups, groups with operators, integral domains and fields, extensions of rings and fields, elementary factorization theory, modules and ideals. Prerequisite: Mth 361 or equivalent.

**MTH 565-566. LINEAR ALGEBRA AND MATRICES**

Vector spaces, linear transformations and matrices, determinants, equivalence relations, canonical forms, functions of vectors. Orthogonal and Unitary equivalence, structure of polynomial rings, equivalence of matrices over a ring similarity of matrices, linear inequalities. Prerequisite: Mth 361 or equivalent.

**MTH 571-572. LINEAR TOPOLOGICAL SPACES**


**MTH 575. DIFFERENTIAL GEOMETRY**

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 599. PHILOSOPHICAL FOUNDATIONS OF MATHEMATICS**

The philosophical character of mathematical concepts. Nature, foundation and method of mathematics. The historical inter-relation of Philosophy and Mathematics from the Greeks to the present day. May be replaced by Phl 505.
Philosophy (PHL)  

Rev. Edmund L. Rhodes, S.M., Chairman

The courses below marked with an asterisk are intended primarily for graduate students in Education. Prerequisites for enrolling in any of these courses for credit in the M.S. in Education degree is the completion of the twelve semester hours of basic undergraduate sequence in Philosophy courses.

These courses are also open to graduate students for the M.A. degree in Philosophy under conditions stated in this Bulletin concerning the use of advanced undergraduate courses open to graduate students.

*PHL 408. History of Modern Philosophy  
*PHL 410. History of Political Philosophy  
*PHL 430. Philosophy of Plato  
*PHL 432. Philosophy of Aristotle  
*PHL 434. St. Thomas Aquinas  
*PHL 450. Problems in Philosophy

PHL 504. Philosophy of Art  
An analysis of the nature of art, beauty, and the aesthetic judgment in the light of the philosophical principles and distinctive conditions found in each: a discussion of the permanent and inward relationship of the values of truth, goodness and beauty.

PHL 505. Inter-Disciplinary Seminar  
Special emphasis to be given to the current interrelations of science, philosophy, the humanities, religion, education and government.

PHL 515. Methods of Research in Philosophy Seminar  
The seminar aims to acquaint students with the methods, materials and tools special to and necessary for philosophical research.

PHL 525. Thomistic Texts and Commentaries  
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  
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 545. Modern French Philosophy  
An examination of the leading philosophical movements in France with particular emphasis on the rationalism of Descartes, the spiritualistic realism of Bergson, the positivism of Comte, and the existentialism of contemporary philosophers.

PHL 555. Modern German Philosophy  
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
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. The History and Literature of American Philosophy
A survey of the major trends and issues of American thought from the 18th century to the present, especially as reflected in the writings of Edwards, Jefferson, Emerson; Royce, Peirce, James, Dewey, and Santayana. The development of democratic traditions; transcendentalism; the significance of recent European importation.

Phl 570. Existentialist Philosophy
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.

Physics (Phy)

Prerequisite for enrolling in any of these courses for graduate credit toward the M.S. in Education degree is the completion of undergraduate requirements for standard teacher certification in Physics or in Physical Science plus the completion of one year of college mathematics.

Phy 351. Introduction to Astronomy
Prerequisites: Mth 202 Differential and Integral Calculus II, and Phy 206, 207, 208 General Physics.

Phy 420. Introduction to Solid State
Prerequisite: Phy 311.

Phy 440. X-Rays
Prerequisites: Mth 218, Phy 20\textsuperscript{p}, 207, 208. Recommended previous course: Phy 311.

Phy 450. Advanced Astronomy
Prerequisite: Phy 351 Introduction to Astronomy.

Phy 500. Modern Physics I
The object of the course is to familiarize high school science teachers with some of the current advances in physics. The great present day interest in atomic and nuclear physics stems both from the basic nature of the problems attacked and from the technical applications, which are world in importance. An understanding of the foundations of the subject, together with some of the chief results and trends, a necessity for high school teachers of science.

Phy 500L. Modern Physics Lab I
A laboratory course intended to allow the student to perform experiments discussed in the lecture, to measure fundamental particles, charges, and constants, both modern and classical.

Phy 501. Modern Physics II
A continuation of Phy 500. Modern Physics I.

Phy 501L. Modern Physics Lab II
A continuation of Phy 500L. Modern Physics Lab I.
PHY 505. **Modern Physics for Engineers**

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**

A study of Lagrange's Equations, Hamilton's Principle, conservative and non-conservative systems, central force problems, Principle of Least Action, canonical transformations, Hamilton-Jacobi Theory, oscillating systems, and other selected topics. Prerequisite: Phy 303-304 or equivalent.

PHY 513. **Electromagnetic Theory**

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**


PHY 516. **Philosophical Basis of Modern Physics**

The historical relationship between Philosophy and Physics from the time of the Greeks.

PHY 517. **Quantum Mechanics**

The Schroedinger Wave Equation, matrix mechanics, operators, perturbation theory, approximation methods and scattering theory. Prerequisite: Phy 511.

PHY 520. **Advanced Solid State Physics**

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
Basic properties of the nucleus, the deuteron, nuclear binding energies, scattering, nuclear forces, high energy particles. Prerequisite: Phy 517 or consent or instructor.

PHY 531. ADVANCED GRADUATE LABORATORY
Advanced experiments in classical mechanics, electricity, magnetism, atomic, nuclear and solid state physics. Prerequisite: Approval of Graduate adviser.

PHY 590. GRADUATE THESIS
A research problem in selected topics of physics resulting in a written thesis.

PHY 595. GRADUATE SEMINAR
Weekly Seminars presented by graduate students, faculty and guest lecturers on current topics.

PHY 599. SPECIAL PROBLEMS
Laboratory or library work in selected topics of physics. Topics include: Plasma Physics, Polymer Physics, Advanced Quantum Mechanics. Prerequisite: Approval of Graduate Adviser.

Psychology (Psy)

PSY 307. PSYCHOLOGY OF EXCEPTIONAL CHILDREN
PSY 312. ABNORMAL PSYCHOLOGY
Prerequisite: Psy 305 Mental Hygiene, or equivalent.

PSY 401. ADVANCED STATISTICS
Prerequisite: Psy 302 Elementary Statistics, or Edu 503.

PSY 408. SOCIAL PSYCHOLOGY
Prerequisites: Six hours of Psychology or Educational Psychology.

PSY 420. INDUSTRIAL PSYCHOLOGY
Prerequisites: Psy 302 or Edu 503.

Theological Studies (THL)

THL 500. PHILOSOPHY OF RELIGION
A systematic interpretation of the essential bond that unites man to God in a real relation of the creature and the Creator; a Christian philosophic approach to this personal social relationship in the dimension of immanence and transcendence; and exposition of the sacred and eternal in the human and divine society effected by faith and love in the human being made to the image and likeness of God.
THL 501. **History of Religion**

The comparative role of Christianity and non-Christian religions in the molding of world civilization and, in particular, in the Western culture. Among all religions, the unique doctrinal, moral, and liturgical features of Christianity, with special investigation of their processive incarnational character.

THL 505. **Theology of the Incarnation**

An appreciative study of the Incarnation of the Word of God divinely revealed in Sacred Scriptures and Tradition as the pivotal truth of Christianity, together with its doctrinal developments and precisions necessitated by the key Christological controversies of the patristic, medieval, and contemporary eras, as well as its consequent influence on Christian life and practice during these same periods.

THL 520. **Role of the Mother of God in the Incarnation**

The Divine Maternity, principle of Mary’s excellence; the spiritual maternity: the meaning of the doctrine, pronouncements of the Magisterium, the evidence from Scripture, the voice of Tradition, the theological explanation; relation to other privileges, special questions of the 19th and 20th century authors. The Universal Mediation of Mary.

THL 521. **Privileges of the Blessed Virgin**

The Immaculate conception: defined doctrine, proof from Sacred Scripture, argument from Tradition, proof from theological reason, alleged debt of sin in Mary, immunity from concupiscence, consequences, greatness of the privilege; the Assumption: (1) Our Lady’s Death, adversaries, proof of the thesis, question of Mary’s death after Munificentissimus Deus; (2) The Assumption itself: Catholic dogma, errors, proofs from the Magisterium, Scripture, Tradition, Liturgy, Connection with other truths.

THL 522. **History of Mariology**

An historical treatment of the principal ideas in the Mariological treatise in order to see the development of dogma and theological doctrine from the time of the Fathers of the Church to the present era. Special emphasis will be given to the doctrines of the spiritual maternity and the coredemption.

THL 540. **The Church of Christ**

Institution and Organization of the Church of Christ. Functions and characteristics of the Church. The hierarchy and the Roman Pontiff. The Church as the Mystical Body of Christ.

THL 541. **Church and State**

A definition of the problem in terms of institutions; its historical perspectives with emphasis on its contemporary significance. A presentation of the basic elements involved in any solution of the problem.

THL 542. **The Catholic Church in America**

An intensive study of the history, structure and regional diversity of the Church in our pluralistic society and a consideration of the widening impact of the Church on the national community in areas vital both to the United States and the supernatural mission of the Mystical Body in our country.
THL 543. Missiology: The Missionary Movement in the Church

THL 543. Missiology: The Missionary Movement in the Church
THREE CREDIT HOURS
An intensive study of the nature of the Church's mission and its implementation throughout the course of history, with special emphasis on the latest developments, particularly on the increasingly vital role that the laity are to play in the missionary conquests of the Church.

THL 544. Theological Perspectives of the Apostolate
THREE CREDIT HOURS
A dynamic study of Christian social morality in the light of the mission of the Church; the mystery of the Church; the role of Christ the King; apostolic life in Christ; apostolic purifications and temptations; the exigencies of the missionary spirit.

THL 545. Canon Law for the Laity
THREE CREDIT HOURS
A consideration of those points in the official law of the Church which are of great practical importance in the life of the layman.

THL 590. Seminar with Monograph
THREE CREDIT HOURS

THL 599. Thesis
SIX CREDIT HOURS
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RETROSPECT AND PROSPECT

The first organized program of graduate work at the University of Dayton was set up in the summer of 1939. It was modest in its beginnings, being limited to offerings in the fields of Education and English. This summer program was continued immediately in the regular school year of 1939-40, with an additional field in Philosophy. The faculty and students of the new unit formed a distinct division, having its own administration and its own objectives within the general framework of the educational policies of the University.

In the summer of 1942 the offerings of the Graduate Division were further extended to include the fields of Economics and Psychology, and in January of 1943 Political Science was added.

The content, policies, and scope of the graduate work at the University of Dayton grew out of the discussions and under the guidance of the Graduate Council of Ohio, particularly those held at Columbus in 1939, and out of the needs and demands of students in the Dayton area.

In this form the graduate division of the University carried on a successful program of work until 1949, when it was temporarily discontinued by the University on its own initiative, in order to devote all its facilities and personnel to the rapidly expanding undergraduate enrollment that flooded the campus after World War II.

During the period from 1945 to 1956, the University, therefore, concentrated its efforts on strengthening the undergraduate program in its facilities and faculty, having in view at all times the resumption of graduate work at the earliest possible date.

In 1956-57 a searching self-survey of the University was conducted, followed by an intensive program of self-improvement over the succeeding years, that gave ground for taking up again, with prudence and discretion, the kind of advanced work which the very name “University” connotes.

Accordingly, with clearance from the North Central Association of Colleges and Secondary Schools, and with the authorization of the State Department of Education of Ohio, the graduate work of the University of Dayton was reactivated in the summer of 1960, with three distinct programs in the field of Education, leading toward a Master of Science in Education degree.

Through a rigorous investigation by a Committee on Graduate Studies, specifically created for the purpose, the departments of Theology, History, Mathematics, and Chemistry were cleared for advanced work, and, in the summer of 1961, the Graduate School of Arts and Sciences was inaugurated to administer programs leading to the Master of Arts and Master of Science degrees.
After careful study of local needs and the resources of the School of Engineering, the University further expanded its graduate offerings by the initiation of a program of study leading to the Master of Science in Engineering degree. This program was launched in the fall semester 1961-62.

Finally, the School of Business Administration was cleared for graduate work leading to the M.B.A. degree, in the school year 1963-64.

For more detailed information on any program, write to the proper Dean:

Very Rev. John A. Elbert, S.M.
Dean, Graduate School of Arts and Sciences
St. Mary's Hall—Room 122
Telephone Extension 317

Office hours:
Monday through Friday
8:30 a.m. to 12:00 noon
12:30 p.m. to 4:30 p.m.
7:15 p.m. to 9:15 p.m.

Dr. Louis J. Faerber, S.M.
Dean, School of Education
Chaminade Hall—Room 213
Telephone Extension 333

Office hours:
Monday through Friday
1:00 p.m. to 9:15 p.m.
Saturday
8:00 a.m. to 12:30 p.m.

Dr. Maurice R. Graney
Dean, School of Engineering
St. Mary's Hall—Room 201
Telephone Extension 217

Office hours:
Monday through Friday
8:00 a.m. to 12:00 noon
1:00 p.m. to 4:00 p.m.
Saturday and Evening
By appointment

Prof. William J. Hoben
Dean, School of Business Administration
St. Mary's Hall—Room 311
Telephone Extension 361

Office hours:
Monday through Friday
8:00 a.m. to 12:00 noon
1:00 p.m. to 4:30 p.m.
Tuesday and Wednesday
6:00 p.m. to 9:00 p.m.