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## Calendar 1961-62

### FIRST SEMESTER

- **July 8**, Sat.
- **Sept. 5, 6, 7**
  - Tues., Wed., Thurs.
  - (5:00-8:30 p.m.)
- **Sept. 14**, Thurs., 4:00 p.m.
- **Sept. 21**, Thurs.
- **Oct. 2**, Mon.
- **Nov. 1**, Wed.
- **Nov. 18**, Sat.
- **Nov. 22, 23, 24**
  - Thurs., Fri., Sat.
- **Dec. 4**, Mon.
- **Dec. 8**, Fri.
- **Jan. 3**, Wed.
- **Jan. 20**, Sat.

### SECOND SEMESTER

- **Jan. 30, 31**
  - Tues., Wed.
  - (5:00-8:30 p.m.)
- **Feb. 5**, Mon.
- **Feb. 10**, Sat.
- **Feb. 26**, Mon.
- **March 3**, Sat.
- **April 18**, Wed. through **April 24**, Tues.
- **April 25**, Wed.
- **April 28**, Sat.
- **May 24**, Wed. through **May 29**, Tues.
- **June 2**, Sat.
Administrative Officers

ADMINISTRATION

President ....................................................... Very Rev. Raymond A. Roesch, S.M.
Vice-President .............................................. Rev. George B. Barrett, S.M.
Dean of the University ...................................... Rev. Thomas A. Stanley, S.M.
Business Manager ........................................... Bro. Francis J. Perko, S.M.
Assistant to the President .................................. Bro. Elmer C. Lackner, S.M.

ACADEMIC AFFAIRS

Chairman, Academic Council .............................. Rev. Thomas A. Stanley, S.M.
Dean, Graduate School of Arts and Sciences ........ Rev. John A. Elbert, S.M.
Dean, College of Arts and Sciences ....................... Bro. Leonard A. Mann, S.M.
Associate Dean ............................................... Rev. Matthew F. Kohlmescher, S.M.
Dean, School of Business Administration ............... Dr. Hilary R. Beth
Dean, School of Education ................................ Bro. Louis J. Faerber, S.M.
Associate Dean ............................................... Bro. Thomas J. Powers, S.M.
Dean, School of Engineering ................................ Dr. Maurice R. Graney
Assistant Dean ................................................ Prof. Raymond J. Stith
Director, Technical Institute .............................. Prof. Donald C. Metz
Director, Evening & Summer Sessions ..................... Bro. Joseph J. Mervar, S.M.
Assistant to Director ......................................... Prof. Robert E. Donovan
Registrar ....................................................... Bro. John J. Dreup, S.M.
Librarian .......................................................... Bro. Walter A. Roesch, S.M.

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I. H. Jones, Treasurer ......................................... Merle P. Smith, Secretary
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Edwin G. Becker ............................................. Robert S. Oelmann
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Prof. Donald C. Metz
SCHOOL OF ENGINEERING
GRADUATE STUDY COMMITTEE

Bro. R. A. Thomson, S.M., Chairman
Prof. M. D. Schmid
Prof. B. M. Schmidt
Prof. J. H. Wilder

ENGINEERING FACULTY AND
SUPPORTING SCIENCE FACULTY

H. Lamar Aldrich, M.S. in Ed.
Perry A. Borden, B.Sc.
Joseph J. Chamberlain, Jr., M.C.E.
Thaddeus G. Csaky, Dipl. Ing.
George F. Driscoll, C.E.
Stephen Eros, Ph.D.
Martinus H. M. Esser, Ph.D.
Maurice R. Graney, Ph.D.
Charles I. Keller, Ph.D.
Reinhold W. Kubach, B.E.E.
Leonard A. Mann, S.M., Ph.D.
Robert I. Mitchell, M.S.
Adrian J. Morgan, M.S.
Jagdish Nanda, Ph.D.
Harold Nielsen, B.S.
Louis H. Rose, S.M., M.S.
Seymour J. Ryckman, M.S.
Merle D. Schmid, Ph.D.
Bernhard M. Schmidt, M.Sc.
Kenneth C. Schrout, Ph.D.
Howard E. Smith, M.S.
Joseph W. Stander, S.M., Ph.D.
Raymond J. Stith, M.S.C.E.
Robert A. Thomson, S.M., Ph.D.
Joseph R. Thorne, M.S.
Jesse H. Wilder, M.S.
Harold E. Wright, M.S. (on leave)
James N. Yakura, M.S. (on leave)
Foreword

Graduate Work was offered for the first time by the University of Dayton in 1939. During the post-war years, it was discontinued because of the rapidly expanding undergraduate enrollment. From 1956 to 1960, an intensive program of self-improvement readied the University to reactivate graduate work and clearance from the North Central Association was received in 1960. In the summer of that year, classes were started in Education. During the summer and fall of 1961, programs in the Graduate School of Arts and Sciences will be inaugurated. With the publication of this Bulletin, the University further expands its graduate offerings by the initiation of a program of study leading to the Master of Science in Engineering degree. This program will be launched by offering the first courses in the fall semester 1961-62.

Graduate work in engineering will be available on a late afternoon, early evening basis during this first year. 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 first program, which is described in detail in the remainder of this Bulletin, 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.

Aim and Philosophy

A Graduate School should have an end or purpose that distinguishes it from every other type or level of educational endeavor.

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 to 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; it presupposes academic and personal maturity and makes more than average demand upon the initiative, the industry, and the scholarship of the candidate for an advanced degree.

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.

The University's computer laboratory.
Admission

(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. This form may be secured from and must be returned to:

Chairman, Graduate Study Committee
School of Engineering
Room 201, St. Mary's Hall
University of Dayton
Dayton 9, Ohio

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

1. Bachelor's degree in engineering from an institution having curricula accredited by the Engineers' Council for Professional Development.
2. 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.
3. Exceptions to the above requirements will be considered on an individual basis by the Graduate Study Committee of the School of Engineering.

(c) Application for admission normally will require the following procedure:

1. Fill out the Application for Admission to Graduate Study in Engineering completely and return it to the office of the Chairman, Graduate Study Committee.
2. Furnish a transcript or transcripts of all undergraduate and graduate work pursued previously. Transcripts must be mailed directly by the Registrar of the institution where the work was done to the Chairman, Graduate Study Committee.
3. Supply three letters of recommendation from persons qualified to judge the candidate as a prospective graduate student. These should be mailed directly to the Chairman, Graduate Study Committee.
4. When requested, submit scores on the general aptitude and major subject sections of the Graduate Record Examination.
5. When from outside the United States, supply evidence of an adequate command of English, sufficient finances, and certification of health.
6. Have all this information in the office of the Chairman, Graduate Study Committee, by August 15 for fall semester admission, and by January 1 for the spring semester. It is the responsibility of the student that his application with all the necessary supporting documents be complete and in order before the specified date to be admitted to regular status.

(d) All students admitted to graduate study in the School of Engineering will be classified in one of the following categories:

1. Regular Students
   Those who have met satisfactorily all general and specific requirements of the School of Engineering. The Dean will appoint a student advisory committee for each regular student and name one committee member as chairman and thesis advisor. The student must file a program of study recommended by his chairman and subsequently approved by the Graduate Study Committee of the School of Engineering.

2. Special Students
   Those who are included in one of the following groups:
   
   Conditional Status
   Those who have not met satisfactorily all of the general and specific requirements of the School of Engineering. Conditional status may be changed to regular status when a student meets the stipulated requirements.
   
   Transient Status
   Students who are working toward a degree at another institution and are authorized by the Dean of that institution to take specific courses at the University of Dayton for transfer credit. Such students must satisfy all the registration requirements for the given course that are mandatory for students working toward a degree at the University of Dayton.
   
   Auditor Status
   Properly qualified students who wish to follow graduate courses may be admitted to certain classes with the permission of and under the conditions required by the instructor. Tuition for auditors is the same as for regular students. No academic credit is allowed for auditing courses.

(c) When a student is notified that he is admitted, he will also be notified of his classification.

Admission to Candidacy

A Comprehensive Examination is required for admittance to candidacy for the degree. This examination is given after the student has completed approximately 18 credit hours of graduate class work and is administered by the student's advisory committee.

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 may be met by satisfying all of the following:

a. Obtain admission to candidacy.
b. Complete a prescribed program of study with a minimum of 33 credit hours of which at least 24 credit hours must be with grades of "A" or "B." The program must be completed within five years after admission to candidacy.

c. Earn a cumulative grade point average of 3.00 or better for all courses included in the program of study.

d. Submit an acceptable thesis.

e. Satisfactorily pass an oral thesis examination.

The student is responsible for seeing that all of the above requirements are met.

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 semester 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.

d. Graduate Marking System
   
   A — Good .................. 4 quality points
   B — Fair .................. 3 quality points
   C — Poor .................. 2 quality points
   F — Fail .................. 0 quality points
   I — Incomplete .......... 0 quality points
   W — Withdrawal .......... 0 quality points

e. No student may remain in the program after he has received more than nine hours of credit with a grade below "B."

f. Time Limit
   The degree must be completed in not more than five years after the student has been admitted to candidacy.

The Program of Studies

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.

Each program of study must include a minimum of 33 credit hours and be organized in the following pattern:

a. Basic Sciences
   six to nine credit hours

b. Engineering Sciences
   twelve credit hours selected from the following courses:
   
   EGR 503. Thermodynamics .................... 3 Cr. Hrs.
   EGR 504. Mass and Energy Transport .......... 3 Cr. Hrs.
   EGR 505. Properties of Materials ............. 3 Cr. Hrs.
   EGR 506. Solid State Devices ................ 3 Cr. Hrs.

c. Pro-seminar
   three credit hours

d. Thesis Related Courses
   three to six credit hours in courses approved by the student's advisory committee

e. Thesis
   six credit hours on an approved research project

Dr. Robert Thomson, S.M., Associate Professor of Engineering Mechanics, photographs a stress pattern utilizing a transmission polariscope.
Library Resources

The University of Dayton Library holdings are located in three principal areas. The Albert Emanuel Library holds all general holdings plus the concentration of titles in the field of Electrical Engineering. The Wohlenben Hall Library holds all other engineering works and titles in Chemistry and Geology. The Sherman Hall Library holds the remaining science titles.

There are several other libraries in the area available to graduate students. These include the public libraries, the Engineers’ Club, certain local industries, and some areas at Wright-Patterson Air Force Base.

Registration and Fees

Graduate students register on the regular registration days at the beginning of each semester. Registration dates shown in the Calendar of this Bulletin are dates coinciding with the evening school registration. This is done for the convenience of students who are employed during the day and are pursuing an evening-hour program. It is permissible to register during the regular day-school registration period.

All graduate students must obtain registration permits in the Engineering Office, St. Mary’s Hall, Room 201.

Tuition and laboratory fees are shown with the course number in the composite schedules announcing course offerings. Such charges and other charges assessed students follow the listing below.

- Registration $2.00
- Penalty for Late Registration $5.00
- Tuition per Credit Hour $30.00
- A Deferred Semester Examination $5.00
- A Second Comprehensive Examination $25.00
- Graduation Fee, M.S. Degree $25.00

Courses of Instruction

Engineering (EGR)

EGR 501. Applied Elasticity
Three Credit Hours

EGR 502. Mechanics of Fluids
Three Credit Hours
Fluid properties, important differential equations in fluid flow, laminar and turbulent flow, boundary layer flow, introduction to compressible flow.

EGR 503. Thermodynamics
Three Credit Hours
Thermodynamic concepts; the laws of thermodynamics; kinetic theory of gases; introduction to the Maxwell-Boltzmann statistics and their applications.

EGR 504. Mass and Energy Transport
Three Credit Hours
Basic concepts, principles and definitions, rate equations, thermodynamic principles, applications.

EGR 505. Properties of Materials
Three Credit Hours
Structure, properties, and behavior of materials. Conductivity, diffusivity, electrochemistry, elasticity, plasticity, fracture, viscosity.

EGR 506. Solid State Devices
Three Credit Hours
Introduction to the theory of solid state devices. Electron emission devices, semiconductor devices, dielectric devices, and magnetic devices. Mathematical technique beyond differential equations will be developed as needed.

EGR 511. Systems Analysis, Design & Evaluation
Three Credit Hours
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.

EGR 512. Reliability
Three Credit Hours
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.

EGR 516. Modern Electron Devices
Three Credit Hours
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 should include MTH 421, MTH 422, Phy 505 or equivalent.*

**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**

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 550. Pro-seminar for Graduate Students in Engineering**

The place of engineering and the engineer in present day society. The philosophical bases for engineering enterprise and the meaning of engineering achievement.

**Engineering Mechanics (EGM)**

**EGM 501. Experimental Stress Analysis**

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**

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.*

**Mathematics (MTH)**

**MTH 421. Advanced Calculus I**

The number system, sequences and series, function of a real variable, functions of several variables.

*Prerequisite: MTH 202 or MTH 218.*

**MTH 422. Advanced Calculus II**

The definite integral, improper integrals, line integrals, multiple integrals, and uniform convergence.

*Prerequisite: MTH 421.*

**Physics (PHY)**

**PHY 505. Modern Physics**

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.