

# IX School of Engineering

DR. MAURICE GRANEY, *Dean*

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## GENERAL STATEMENT

The School of Engineering has as its purpose the implementation of the general purposes of the University of Dayton in the development of professional attitudes and competencies within its area of academic disciplines.

The engineering curricula in each of the fields of chemical, civil, electrical, industrial, and mechanical engineering are drawn up for a four year minimum period.

No effort is spared to acquaint the student thoroughly with fundamental principles and to give him a clear insight into the analysis of engineering problems. While emphasis is laid on fundamental theory, continued attention is paid to the solution of practical problems for the purpose of illustrating scientific principles and pointing out their industrial applications.

The broader responsibilities of the engineering profession demand that the professional training of an engineer include at least an acquaintance with the humanities in order that scientific discoveries and developments by engineers may result in the real advancement of man. To help the young engineer achieve his purpose in life, the University offers, in addition to the prescribed engineering subjects, a wide selection of courses in the arts and sciences.

## ENGINEERING MATHEMATICS

Since a sound knowledge of mathematics is essential for success in engineering, the School of Engineering tries to place each entering student at the proper level. Freshmen who are qualified will be placed in Mth 118, Analytic Geometry and Calculus I. Those who are not qualified will be placed in a lower level mathematics course.

## DEGREE REQUIREMENTS

The Degrees—Bachelor of Chemical, Civil, Electrical, Industrial, and Mechanical

Engineering—are conferred at commencement if the following requirements have been fulfilled:

- 1) All prescribed courses outlined in the respective curricula must have been passed with a grade "D" or better. Courses may be scheduled in terms other than listed, however, all prerequisites and corequisites must be met;
- 2) The cumulative quality point average must be at least 2.0;
- 3) The student must have attended the School of Engineering at the University of Dayton during his senior year, and have carried at least thirty credit hours.

### CURRICULUM FOR ALL ENGINEERING FRESHMEN

<i>Dept.</i>	<i>No.</i>	<i>Course</i>	<i>1st Term</i> <sup>1</sup>	<i>2nd Term</i>	<i>3rd Term</i>
CHM	123	General Chemistry		3-3-4	
CPS	133	Fortran Programming		2-0-2	
EGM	101	Mechanics I		3-0-3	
EGR <sup>2</sup>	101-2	Introduction to Engineering	1-0-1	1-0-1	
ENG	101	Language and Thought	3-0-3		
MTH	118-9	Analytical Geometry and Calculus	4-0-4	4-0-4	
MEE	106L	Engineering Graphics I	0-6-2		
PHL	106	Basic Problems in Philosophy I	3-0-3		
PHY	196	General Physics I	3-0-3		
THL <sup>3</sup>	112	Foundations in Theology		3-0-3	
			16	17	

<sup>1</sup>Under "Term," 3-0-3 means 3 hrs. class, 0 hrs. laboratory, 3 hrs. credit.

<sup>2</sup>An introduction to the School of Engineering, the profession of engineering, and related topics.

<sup>3</sup>Non-Catholics take H-S Elective.

### CHEMICAL ENGINEERING

Chemical engineering applies the principles of the physical sciences, economics and human relations to fields that pertain to processes and process equipment in which matter is treated to effect a change in state, energy or composition.

The first part of the curriculum provides a firm foundation in mathematics, physics and chemistry. The chemistry background is stressed in chemical engineering. Courses include inorganic, organic, and physical chemistry. The second part of the curriculum stresses chemical engineering topics such as transport phenomena, thermodynamics, kinetics, unit operations and processes, process control, materials of construction and design.

The Chemical Engineering department is located in Wohlleben Hall. Three stories of the north wing house the Unit Operations Laboratory. Experimental equipment includes units for the study of fluid flow, heat transfer, distillation extraction, filtration, evaporation and drying. The Process Control and Transport Phenomena Laboratories are located on the second floor. In addition to the instructional laboratories, the department has a wood working shop, pipe fitting shop, analytical laboratory and dark room.

The curriculum in chemical engineering serves as basic training for graduate study or for positions in diverse areas of the chemical industry.

### PROGRAM—EN1: BACHELOR OF CHEMICAL ENGINEERING

<i>Dept.</i>	<i>No.</i>	<i>Course</i>	<i>1st Term<sup>1</sup></i>	<i>2nd Term</i>	<i>3rd Term</i>
<i>Sophomore Year</i>					
CHM	124	General Chemistry	3-3-4		
CME	203	Material and Energy Balances	3-0-3		
CHM	315	Organic Chemistry		3-0-3	
CHM	313L	Organic Chemistry Lab		0-3-1	
ENG	106	Language and Literature	3-0-3		
MTH	218	Analytic Geometry and Calculus III	4-0-4		
MTH	219	Applied Differential Equations		3-0-3	
PHL	206	Basic Problems in Philosophy II		3-0-3	
PHY	207-8	General Physics	3-0-3	3-0-3	
SPE	101	Fundamentals of Effective Speaking		3-0-3	
			17	16	
<i>Junior Year</i>					
CME	305	Thermodynamics		3-0-3	
CME	324-5	Transport Phenomena	3-0-3	3-0-3	
CME	326L	Transport Phenomena Lab		0-3-1	
CME	381	Applied Math for Chemical Engineers	3-0-3		
CHM	303-4	Physical Chemistry	3-3-4	3-3-4	
CHM	316	Organic Chemistry	3-0-3		
CHM	314L	Organic Chemistry Lab	0-3-1		
ELE	321	Basic Electric Theory		3-0-3	
H-S	—	Humanistic-Social Studies Elective	3-0-3		
THL <sup>2</sup>	—	Theology Elective		3-0-3	
			17	17	

**PROGRAM—EN1—Continued**

<i>Dept.</i>	<i>No.</i>	<i>Course</i>	<i>1st Term<sup>1</sup></i>	<i>2nd Term</i>	<i>3rd Term</i>
<i>Senior Year</i>					
CME	306	Kinetics	3-0-3		
CME	411-2	Unit Operations	3-0-3	3-0-3	
CME	413L-4L	Unit Operations Laboratory	0-5-2	0-5-2	
CME	430	Chemical Engineering Design		3-0-3	
CME	452	Process Control	3-0-3		
CME	453L	Process Control Laboratory		0-3-1	
CME <sup>3</sup>	—	Technical Electives	3-0-3	6-0-6	
H-S	—	Humanistic-Social Studies Electives	3-0-3	3-0-3	
			17	18	

<sup>1</sup>Under "Term," 3-0-3 means 3 hrs. class, 0 hrs. laboratory, 3 hrs. credit.

<sup>2</sup>Non-Catholic students take H-S Elective.

<sup>3</sup>In the senior year, students who are academically qualified may register for graduate level courses as Technical Electives. If a student, after graduation with a BChE degree from the University of Dayton, is admitted to Graduate Studies at the University of Dayton, the graduate level courses taken in the senior year may be accepted as part of the requirement for a Master's degree in the Chemical Engineering Department.

**CIVIL ENGINEERING**

The curriculum is designed to give a thorough education in the principles fundamental to the civil engineering profession, so that the graduate is prepared to pursue to advantage any field of civil practice of advanced study.

During the first two years, emphasis is placed on those subjects underlying all engineering—English, mathematics, chemistry, physics, graphics, surveying, mechanics. The third and fourth years are devoted principally to technical subjects relative to hydraulic, sanitary, structural, highway, and soils engineering.

Engineering projects, completed or under construction, are visited under the guidance of the instructors. The Student Chapter of the American Society of Civil Engineers is very active, and close association is maintained with the Dayton Section of the American Society of Civil Engineers.

## PROGRAM—EN2: BACHELOR OF CIVIL ENGINEERING

Dept.	No.	Course	1st Term <sup>1</sup>	2nd Term	3rd Term
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*Sophomore Year*

CIE <sup>2</sup>	205L	Surveying Field Practice			3-0-3
CIE	207-8	Surveying	4-0-4	3-0-3	
CIE	310L	Civil Engineering Laboratory		0-3-1	
CIE	408B	Seminar	1-0-0	1-0-0	
EGM	301	Dynamics		3-0-3	
EGM	303	Strength of Materials	3-0-3		
ENG	106	Language and Literature	3-0-3		
GEO	218	Engineering Geology		3-0-3	
MTH	218	Analytic Geometry and Calculus III	4-0-4		
MTH	219	Applied Differential Equations			3-0-3
PHL	206	Basic Problems in Philosophy II			3-0-3
PHY	207-8	General Physics	3-0-3	3-0-3	
MEE	207L	Engineering Graphics II		0-6-2	
			17	15	9

*Junior Year*

CHM	124	General Chemistry		3-3-4	
CIE	312	Soil Mechanics		3-3-4	
CIE	313	Hydraulics	3-3-4		
CIE	315	Theory of Structures	2-3-3		
CIE	408B	Seminar	1-0-0	1-0-0	
EGM	304	Advanced Strength of Materials	3-0-3		
ENGR <sup>3</sup>	—	Technical Electives	3-0-3	3-0-3	
H-S	—	Humanistic-Social Studies Electives	2-0-2	3-0-3	
SPE	101	Fundamentals of Effective Speaking	3-0-3		
THL <sup>4</sup>	—	Theology Elective		3-0-3	
			18	17	

*Senior Year*

CIE	405	Highway Engineering	3-0-3		
CIE	406	Indeterminate Structures		3-0-3	
CIE	408B-A	Seminar	1-0-0	1-0-1	
CIE	415	Structural Design I	3-0-3		
CIE	417	Reinforced Concrete	2-3-3		
CIE	418	Structural Design II		0-8-3	
CIE	433-4	Sanitary Engineering	3-0-3	3-0-3	
CIE <sup>5</sup>	—	Technical Electives	3-0-3	3-0-3	
H-S	—	Humanistic-Social Studies Elective		3-0-3	
			15	16	

33

41

31

140

**PROGRAM—EN2—Continued**

<sup>1</sup>Under "Term," 3-0-3 means 3 hrs. class, 0 hrs. laboratory, 3 hrs. credit.

<sup>2</sup>Three weeks special summer schedule which does not conflict with regular third term.

<sup>3</sup>Select two courses from Ele 321, 322, Mee 301.

<sup>4</sup>Non-Catholic students take H-S Elective.

<sup>5</sup>May select from list of elective courses or by departmental approval select courses listed in Graduate Catalog. A senior student may apply to take additional 500 level courses for graduate credit toward a Master of Science in Civil Engineering degree at the University of Dayton.

**ELECTRICAL ENGINEERING**

The curriculum of electrical engineering is planned with the primary objective of providing a thorough knowledge of the fundamental laws of electricity and the application of these laws in electrical engineering.

Courses are arranged to give the student an understanding of basic principles and practices common to the various fields of electrical engineering so that he is prepared to begin specialization in the field of his choice or to pursue advanced study.

Proper attention is directed to an appreciation of the practical economic factors in the electrical world, and to the cultural and social qualities necessary for a successful career in the engineering profession.

**PROGRAM—EN3: BACHELOR OF ELECTRICAL ENGINEERING**

<i>Dept.</i>	<i>No.</i>	<i>Course</i>	<i>1st Term<sup>1</sup></i>	<i>2nd Term</i>	<i>3rd Term</i>
<i>Sophomore Year<sup>2</sup></i>					
ENG	106	Language and Literature		3-0-3	
ELE	231-2	Circuit Theory I & II	3-0-3	3-0-3	
ELE	233	Field Theory I		3-0-3	
MTH	218	Analytic Geometry and Calculus III	4-0-4		
MTH	219	Applied Differential Equations		3-0-3	
PHL	206	Basic Problems in Philosophy II	3-0-3		
PHY	207-8	General Physics	3-0-3	3-0-3	
SPE	101	Fundamentals of Effective Speaking	3-0-3		
			16	15	

**PROGRAM—EN3—Continued**

<i>Dept.</i>	<i>No.</i>	<i>Course</i>	<i>1st Term<sup>1</sup></i>	<i>2nd Term</i>	<i>3rd Term</i>
<i>Junior Year<sup>2</sup></i>					
EGM	301	Dynamics	3-0-3		
ELE	312-3	Electronics I & II	3-0-3	3-0-3	
ELE	331-2	Circuit Theory III & IV	3-0-3	3-0-3	
ELE	333-4	Field Theory II & III	3-0-3	3-0-3	
ELE	335L-6L	Electrical Engineering Laboratory I & II	0-2-1	0-2-1	
ELE	338L	Electrical Engineering Laboratory III		0-2-1	
ELE	410B	Seminar	1-0-0	1-0-0	
H-S	—	Humanistic Social Studies Elective	3-0-3		
MTH <sup>3</sup>	—	Mathematics Elective		3-0-3	
THL <sup>4</sup>	—	Theology Elective		3-0-3	
			16	17	
<i>Senior Year<sup>2</sup></i>					
CME	305	Thermodynamics	3-0-3		
ELE	410B-A	Seminar	1-0-0	1-0-1	
ELE	413	Communication Engineering	3-0-3		
ELE	431	Energy Conversion	3-0-3		
ELE	432	Automatic Control Systems		3-0-3	
ELE	435-6L	Electrical Engineering Lab. IV & V	0-2-1	0-2-1	
ELE	437L	Electrical Engineering Laboratory VI		0-2-1	
ELE	—	Technical Electives	3-0-3	3-0-3	
H-S	—	Humanistic Social Studies Electives	3-0-3	3-0-3	
INE	313	Engineering Law		2-0-2	
			16	14	

<sup>1</sup>Under "Term," 3-0-3 means 3 hours class, 0 hours laboratory, and 3 hours credit.

<sup>2</sup>Courses may be scheduled in terms other than listed.

<sup>3</sup>Selected from list approved by the Department of Electrical Engineering.

<sup>4</sup>Non-Catholic students take H-S Elective.

**INDUSTRIAL ENGINEERING**

"Industrial Engineering is concerned with the design, improvement, and installation of integrated systems of men, materials, and equipment. It draws upon specialized knowledge and skill in the mathematical, physical, and social sciences together with the principles and methods of engineering analysis and design, to specify, predict, and evaluate the results to be obtained from such systems."<sup>1</sup>

In accord with the purpose and goals of the University, the Industrial Engi-

neering Department has devised a specialized program in Industrial Engineering. It prepares students to use the quantitative, economic, and behavioral ingredients, and the processes of analysis and synthesis in design and decision making.

Students follow a program of study leading to broad and fundamental understanding of technology and of complex man and machine systems. Such a program is desirable for active participation as creative citizens and managers as well as for those who plan for other careers. However, the curriculum is especially designed for those preparing for a professional career in engineering. It includes chemistry, physics, mathematics, the engineering sciences, and courses in analysis and design. They lead to the application of knowledge to practical problems and decision making under economic constraints and uncertainty, and provide a balanced approach to lifelong career and educational development.

The curriculum recognizes *understanding* as being a desirable educational objective. To *understanding* it adds the social and technical design concepts needed by those who will be generating technological changes and the human interactions which have an even greater social impact.

*Industry* as used here means intelligent and purposeful human endeavor. Industrial Engineers, whose services were once largely restricted to manufacturing, now are engaged in organizations of all kinds: government, business, military, academic, financial. Industrial Engineering problems and practices are useful to all areas of human industry where employment is purposeful and systematic, where men give attention to achievement and are diligent in their attempts to accomplish objectives, and especially where land, capital, and labor meet and must be economically and efficiently related.

#### PROGRAM—EN4: BACHELOR OF INDUSTRIAL ENGINEERING

<i>Dept.</i>	<i>No.</i>	<i>Course</i>	<i>1st Term</i> <sup>2</sup>	<i>2nd Term</i>	<i>3rd Term</i>
<i>Sophomore Year</i>					
ENG	106	Language and Literature		3-0-3	
INE	201	Industrial Engineering Fundamentals	3-0-3		
INE	202	Engineering Economy		3-0-3	
MTH	218	Analytic Geometry and Calculus III	4-0-4		
INE	220-1	Statistical Methods for Engineers I & II	3-0-3	3-0-3	
INE	410	Seminar	2-0-1	2-0-1	
PHY	207-8	General Physics	3-0-3	3-0-3	
PHL	206	Basic Problems in Philosophy II	3-0-3		
SPE	101	Fundamentals of Effective Speaking		3-0-3	
			17	16	



**PROGRAM—EN4—Continued**

<i>Dept.</i>	<i>No.</i>	<i>Course</i>	<i>1st Term<sup>1</sup></i>	<i>2nd Term</i>	<i>3rd Term</i>
<i>Junior Year</i>					
CPS	353-4	Numerical Methods I & II	3-0-3	3-0-3	
EGM	301	Dynamics		3-0-3	
ELE	321	Basic Electric Theory	3-0-3		
ELE	322	Fundamentals of Engineering Electronics		2-2-3	
H-S	—	Humanistic-Social Studies Elective	3-0-3		
INE	320-1	Management Systems Design I & II	3-0-3	3-0-3	
INE	341	Work Design I	3-0-3		
INE	410	Seminar	2-0-1	2-0-1	
THL <sup>3</sup>	—	Theology Elective		3-0-3	
			16	16	
<i>Senior Year<sup>4</sup></i>					
CME	305	Thermodynamics		3-0-3	
H-S	—	Humanistic-Social Studies Electives	3-0-3	3-0-3	
INE	410	Seminar	2-0-1	2-0-1	
INE	421	Reliability Theory	3-0-3		
INE	430	Engineering Systems Design I		3-0-3	
INE	442-3	Work Design II & III	2-2-3	2-2-3	
T E <sup>5</sup>	—	Technical Electives	3-0-3	3-0-3	
H-S	—	Elective	2-0-2		
			15	16	

<sup>1</sup>Official definition of the American Institute of Industrial Engineers.

<sup>2</sup>Under "Term," 3-0-3 means 3 hrs. class, 0 hrs. laboratory, and 3 hrs. credit.

<sup>3</sup>Non-Catholic students take H-S Elective.

<sup>4</sup>An Honors Course may be added each term for students designated by Department Chairman.

<sup>5</sup>Students may select from Life Sciences, Physical Sciences, including Mathematics and Computer Science; Engineering Sciences or Analysis and Design.

**MECHANICAL ENGINEERING**

The curriculum of Mechanical Engineering is designed to give the student thorough training in the fundamental principles of the mechanical engineering profession and the application of these principles to pertinent problems.

The course sequence is arranged so that the student completes courses in mathematics and the sciences early in his program. Departmental courses are then

taken which build upon this scientific training. The course of studies includes lectures, recitations and laboratory practice.

Every attempt is made to prepare the student to accept the responsibilities of the profession upon graduation. The curriculum is designed to prepare the student equally well to enter the practice of engineering upon graduation, or to pursue an advanced degree through further study.

### PROGRAM—EN5: BACHELOR OF MECHANICAL ENGINEERING

<i>Dept.</i>	<i>No.</i>	<i>Course</i>	<i>1st Term<sup>1</sup></i>	<i>2nd Term</i>	<i>3rd Term</i>
<i>Sophomore Year</i>					
EGM	301	Dynamics	3-0-3		
ELE	321	Basic Electric Theory		3-0-3	
ENG	106	Language and Literature	3-0-3		
MTH	218	Analytic Geometry and Calculus III	4-0-4		
MTH	219	Applied Differential Equations		3-0-3	
MEE	207L	Engineering Graphics II	0-6-2		
MEE	211	Materials and Processes	2-3-3		
MEE	221	Theory of Machines		2-6-4	
MEE	301	Thermodynamics I		3-0-3	
MEE	305L	Mechanical Engineering Lab. I		0-3-1	
PHY	207-8	General Physics	3-0-3	3-0-3	
			18	17	



## PROGRAM—EN5—Continued

<i>Dept.</i>	<i>No.</i>	<i>Course</i>	<i>1st Term</i> <sup>1</sup>	<i>2nd Term</i>	<i>3rd Term</i>
<i>Junior Year</i>					
EGM	303	Strength of Materials	3-0-3		
EGM	303L	Strength of Materials Lab.		0-3-1	
EGM	304	Advanced Strength of Materials		3-0-3	
ELE	322	Fund. of Engineering Electronics	2-2-3		
INE	202	Engineering Economy		3-0-3	
MEE	302	Thermodynamics II	3-0-3		
MEE	308	Fluid Mechanics	3-0-3		
MEE	312L	Mechanical Engineering Lab. II	0-3-1		
MEE	316	Mechanical Engineering Analysis	3-0-3		
MEE	319	Mechanical Vibrations		3-0-3	
MEE	320	Thermal Engineering I		2-0-2	
MEE	414B	Seminar	1-0-0	1-0-0	
PHY	437	Modern Physics for Engineers		3-0-3	
SPE	101	Fundamentals of Effective Speaking		3-0-3	
H-S	—	Elective	2-0-2		
			18	18	
<i>Senior Year</i>					
H-S	—	Humanistic-Social Studies Electives	3-0-3	3-0-3	
MEE	303	Metallurgy	2-3-3		
MEE	407-8	Machine Design	2-3-3	2-3-3	
MEE	410	Heat Transfer	3-0-3		
MEE	414-B-A	Seminar	1-0-0	1-0-1	
MEE	417	Thermal Engineering II	3-0-3		
MEE	418	Advanced Fluid Mechanics	3-0-3		
MEE	424L	Mechanical Engineering Lab. III		0-3-1	
MEE	425L	Mechanical Engineering Lab. IV		0-3-1	
MEE <sup>3</sup>	—	Technical Elective		3-0-3	
PHL	206	Basic Problems in Philosophy II		3-0-3	
THL <sup>2</sup>	—	Theology Elective		3-0-3	
			18	18	

<sup>1</sup>Under "Term," 3-0-3 means 3 hrs. class, 0 hrs. laboratory, 3 hrs. credit.

<sup>2</sup>Non-Catholic students take H-S Elective.

<sup>3</sup>A technical course from other engineering departments or science may be elected with the approval of the Department Chairman.

