



# the Bulletin

AUGUST 2009 - UNDERGRADUATE ISSUE

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## School of Engineering

Tony E. Saliba, Dean  
 Malcolm Daniels, Associate Dean  
 Riad Alakkad, Assistant Dean for Undergraduate Advising and Retention  
 John Weber, Assistant Dean for Recruitment and Continuous Improvement

### Our Vision

The Vision of the School of Engineering is to become a preeminent engineering school providing transformational learning experiences that prepare engineering students for leadership, service, and success in life, profession, and society. It is our goal to be recognized for outstanding engineering research that positively advances the human condition, addresses critical needs of the world, and provides economic growth to our region, our nation, and our world. Finally, we are committed to being a nurturing, inclusive environment that promotes the development of all members of the School of Engineering family to their full potential while supporting and advancing the Catholic and Marianist mission of the University of Dayton.

### Our Mission

The Mission of the School of Engineering is to educate complete professionals who have an integrated knowledge of the theory and practice of engineering together with an equally strong understanding of the arts and sciences that will prepare them for fulfilling careers of leadership, service, and life-long learning for the good of society.

### Our Purpose

The School of Engineering has as its primary purpose the education of men and women toward a profound knowledge that engineering is more than a problem-solving discipline. While our curriculum and our research do not directly address issues of faith, we nonetheless affect in many ways the character and sensibilities of our students, not just as problem solvers but as individuals who respect the world that they shape for the good of others. Accordingly, our students receive an education that is rigorously directed toward advanced knowledge in engineering, while demonstrating at every turn the important relationships and interdependencies that exist between engineering and the rest of the disciplines across the full spectrum of human knowledge. We therefore educate students to be both intellectually astute and discerning in all their work and morally responsible in the face of the demands and rewards of our ever-changing world.

As an educational unit of a private university, the School of Engineering strongly emphasizes the advising of students so that they may achieve their educational objectives within the engineering program. First-year students are advised by an advising team. At the end of the second semester, each student is assigned a faculty advisor in his/her program. Academic advising begins before the students begin their formal course work and continues as they progress toward their objectives.

The broader responsibilities of the engineering profession demand that the professional education of an engineer include a significant component of humanities, ethics, and social science studies so that the student will become aware of the urgent problems of society and develop a deeper appreciation of the cultural achievements of humanity. Additionally, such studies provide the proper framework to ensure that scientific discoveries and developments by engineers may result in the true advancement of the human race.



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## Undergraduate Engineering Programs



The engineering program in each of the fields of chemical, civil, computer, electrical, and mechanical engineering is designed to lead to a bachelor's degree in a four-year period. While students pursue curricula they themselves have chosen according to their fields of interest, they all take certain core courses in mathematics, chemistry, physics, English, and engineering fundamentals. All of the programs permit additional specialization (as an overload) in minors and concentrations in areas such as aerospace engineering, computer engineering, computer systems, electro-optics, engineering mechanics, industrial engineering, and structures in the School of Engineering and in other areas such as languages, music, and political science in other units of the University. Although emphasis is on fundamental theories, continued attention is paid to the solution of practical problems which the student will encounter in the practice of engineering.

The programs in chemical engineering, civil engineering, computer engineering, electrical engineering, and mechanical engineering are accredited by the Engineering Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone: (410) 347-7700.

The programs in industrial, global manufacturing systems, and mechanical engineering technology are accredited by the Technology Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone: (410) 347-7700. The program in computer and electronic engineering technology is a new program and will be evaluated by the Technology Accreditation Commission of ABET at the earliest opportunity.

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## Engineering Technology

The School of Engineering also offers a Bachelor of Science in Engineering Technology. The programs in which the degree is offered are:

- Electronic and Computer Engineering Technology
- Global Manufacturing Systems Engineering Technology
- Industrial Engineering Technology
- Mechanical Engineering Technology

Students in Engineering Technology programs participate in an integrated education core in which they study specialized technical courses that emphasize rational thinking and the application of engineering and scientific principles to the practical solution of technological problems. Extensive laboratory experience aids the students in the design, analysis, and implementation of systems, as well as experiencing real-world application problems. The multidisciplinary curriculum culminates in a capstone design project. All programs offer a cooperative education program in which the student is allowed to alternate work and study semesters after the first year. Additionally, many students acquire experience through internships, summer work, or study abroad.

Graduates are critical thinkers who can apply established scientific and engineering knowledge to implement systems, and are prepared to take places in society as responsible, humane, complete professionals. They work effectively on multidisciplinary design teams building complex systems. Graduates are usually involved in the design, performance evaluation, service, and sales of products, equipment, and manufacturing systems or the management of these activities. Several years after graduation, they may find themselves in management positions.

The University of Dayton engineering technology programs prepare graduates who:

- are competent and productive in the practice of both the technical and communication aspects of their profession;
- demonstrate ethical and professional standards of conduct;
- exhibit leadership qualities as appropriate for the practice of their profession;
- are involved in service activities that benefit their profession and their community; and
- are engaged in continuing professional development.

### Transfer Students

The engineering technology programs welcome transfer students from associate degree programs in engineering technology who wish to pursue the Bachelor of Science in Engineering Technology. Graduates of two-year associate degree programs in engineering technology should normally expect to undertake at least two additional years of work for the bachelor's degree.

### Minors in Engineering Technology

Students majoring in any engineering technology program may earn a minor in another engineering technology program by completing 12 approved semester hours of work in the second discipline. Courses already required in the student's program may not be counted in the minor. The director of the program in which the minor is to be earned is responsible for approving the list of courses for the minor.



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The minors available to engineering technology students are:

- Electronic and Computer Engineering Technology
- Global Manufacturing Systems Engineering Technology
- Industrial Engineering Technology
- Mechanical Engineering Technology
- Quality Assurance

Students in engineering technology majors may also participate in the integrated arts and technology (IA&T) program. This program provides a connection between students' aptitude for a technical discipline with their passion for the arts - an aspect currently not found at many other schools of engineering. The program provides a strong foundation in areas such as audio engineering, computer-based visual design, web page design and technical support for live performances. Upon completion of the IA&T program, students receive an integrated arts and technology certificate and a Bachelor of Science in engineering technology.

A minor in Engineering Technology is also offered for students enrolled in majors in the College of Arts and Sciences, the School of Business Administration, and the School of Education and Allied Professions.

### Accreditation

The programs in global manufacturing systems, industrial, and mechanical engineering technology are accredited by the Technology Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone: (410) 347-7700. The program in electronic and computer engineering technology is new and will be reviewed for accreditation at the earliest possible opportunity.

### Engineering Technology First-Year Requirements

Students selecting any of the four engineering technology majors should take the courses prescribed for the first year as listed in the individual curricula in the Academic Information section of the Bulletin. Undeclared engineering technology students should follow the first-year schedule listed below.

MTH	137-138	Calculus I with Review	8
MCT	110L	Technical Drawing & CAD	2
SET	153L	Technical Computation Laboratory	1
CHM	123-123L	General Chemistry with Laboratory	4
ENG	101-102	College Composition I, II	6
	or 114 or 198		
REL	103	Introduction to Religion	3
PHL	103	Introduction to Philosophy	3
HST	103	The West and the World	3
SET	100	First-Year Seminar	1
SET	101	Enrichment Workshop	0
		Total First-Year Requirements	31





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## Minors in Engineering

The student majoring in chemical, civil, computer, electrical, or mechanical engineering may choose a minor area of technical study. The minors program in the School of Engineering provides an opportunity to specialize in a particular technical sub-area while still pursuing a major program of study in one of the traditional and well recognized engineering disciplines. The minors program was designed in response to the needs of industry and government and to the educational needs and career objectives of students. Election of the minor is optional; it may require additional courses for completion.

The minor is defined as at least 12 semester hours of work. It can be composed of any number of 1- to 4-semester-hour courses selected from the approved list of minor areas of study.

The minors available to engineering students are:

- Aerospace Engineering
- Bioengineering
- Chemical Processing
- Composite Materials Engineering
- Computer Systems
- Design and Manufacturing Engineering
- Dynamic Analysis of Mechanical Systems
- Engineering Management
- Engineering Mechanics
- Environmental Engineering
- Materials Engineering
- Mechanics of Engineering Systems
- Operations Engineering
- Polymer Materials
- Signals and Systems
- Structures
- Transportation Engineering
- Water Resources Engineering

A 12 semester hour concentration in electro-optics is available to electrical and computer engineering undergraduates. A 16 semester hour concentration in aerospace engineering is also available to mechanical engineering students. Additional minors from outside the School of Engineering are available in many subject areas.

Students, in consultation with their faculty advisors, normally select the minor or concentration in the second semester of their sophomore year. The minor or concentration is designated on the student's transcript.



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## Degree Requirements

A student enrolls in the curriculum prescribed for the academic year in which he or she is registered as a first-year student at the University of Dayton or elsewhere. If for any reason it is necessary or desirable to change to a subsequently established curriculum, the student must meet all of the requirements of the new curriculum.

The degrees Bachelor of Chemical, Civil, Electrical, or Mechanical Engineering, Bachelor of Science in Computer Engineering, and Bachelor of Science in Engineering Technology are conferred at commencement if the general requirements enumerated in Section V, Academic Regulations have been fulfilled as well as those listed below:

1. All prescribed courses outlined in the respective curricula must have been passed with grades of D or better and the student must obtain a minimum grade point average of 2.000 for the prescribed courses. Although courses may be scheduled in terms other than as listed, all prerequisites and corequisites must be met.
2. All students in the School of Engineering must register under Grade Option 1 for all courses in engineering, mathematics, and science except those offered only under Grade Option 2.
3. The cumulative grade-point average in all courses which have an engineering prefix must be at least 2.0 (C average).
4. The student must have taken their last 30 semester hours through the School of Engineering at the University of Dayton.

The semester hours of credit required for graduation in each engineering curriculum administered by the School of Engineering are as follows:

Bachelor of Chemical Engineering	137
Bachelor of Civil Engineering	138
Bachelor of Electrical Engineering	134
Bachelor of Mechanical Engineering	132
Bachelor of Science in Computer Engineering	137

The semester hours of credit required for graduation in each engineering technology curriculum administered by the School of Engineering are as follows:

### Bachelor of Science in Engineering Technology

Electronic and Computer Engineering Technology Major	130
Global Manufacturing Systems Engineering Technology Major	131
Industrial Engineering Technology Major	129
Mechanical Engineering Technology Major	131



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## Engineering First-Year Requirements



Students who are recent high school graduates or who have earned fewer than 15 semester hours of collegiate credit are classified as first-year students and must meet common engineering program requirements. Such credit requirements may be met in a number of ways, including (1) advanced college-level course work at the University of Dayton or other collegiate institutions, (2) advanced placement examinations, (3) departmental examinations during the first term, or (4) taking the prescribed courses as part of the first year.

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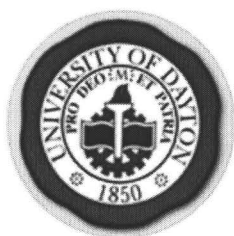
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## Transfer Students


The engineering programs welcome transfer students from both community and senior colleges and work closely with many schools to facilitate transfers from pre-engineering programs. Students may complete the first two years of study in other accredited institutions and transfer to the University of Dayton with little or no loss of credit provided that they have followed programs similar to those prescribed by the University of Dayton School of Engineering.

The School of Engineering has dual degree arrangements as well as curriculum agreements with Sinclair Community College and Edison Community College.



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## 5-Year Combined Bachelor's-Master's Engineering Program



The School of Engineering offers a combined 5-year program leading to both a bachelor's degree in an engineering major (chemical, civil, computer, electrical, mechanical, or technology) and a master's degree. Physics majors (College of Arts and Sciences) may also participate. The program is designed for the qualified student who wishes to pursue either greater specialization in a major area or to complement the undergraduate program with a related graduate-level concentration. Most students who select the program have received some advanced placement upon entry to engineering at the first-year level or take occasional summer courses.

The formal request for entrance into this program may be made as early as before the first semester of the student's junior year, but the student should consult their department to determine exactly when this request should be made. Admission requirements include a minimum cumulative grade point average of 3.00 and permission from the chairperson of the department corresponding to the student's undergraduate major. Selection of the graduate (master's) program area is indicated below:

### Undergraduate Program Graduate Program Selections

Chemical Engineering	Aerospace Engineering
	Chemical Engineering
	Engineering Management
	Management Science
	Materials Engineering
Civil Engineering	Civil Engineering
	Engineering Management
	Management Science
	Materials Engineering
Computer Engineering	Electrical Engineering
	Engineering Management
	Management Science
	Materials Engineering
Electrical Engineering	Aerospace Engineering
	Electrical Engineering
	Electro-Optics
	Engineering Management
	Management Science
Mechanical Engineering	Materials Engineering
	Aerospace Engineering
	Engineering Management
	Management Science
	Materials Engineering
Engineering Technology	Mechanical Engineering
	Engineering Management
Physics	Management Science
	Materials Engineering

The department chairperson and the graduate program director serve as an advisory committee to the student in establishing the 5-year combined program requirements. The first-year, sophomore, and junior years follow the curriculum of the student's selected bachelor's program.

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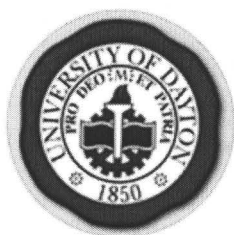
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A student who elects the 5-year combined program must satisfy both undergraduate and graduate degree requirements as to required cumulative grade point average for graduation. The graduate of the combined program will receive a bachelor's degree in the undergraduate major (e.g., Bachelor of Mechanical Engineering) and a master's degree in the graduate area (e.g., Master of Science in Materials Engineering). A student in the 5-year combined program who chooses not to complete the program must complete all the undergraduate major program requirements to receive the bachelor's degree.

**5-Year Bachelor's - Master's Program**

<i>Course Area</i>	<i>Semester Hours</i>	
	1st Term	2nd Term
Senior Year		
Undergraduate department major	11	11
Undergraduate department or University requirement or electives	3	3
Graduate major (taken as graduate credit)	3	3
Total:	17	17
Fifth Year		
Graduate major (including thesis or project)	12	12





## ETHOS

### Engineers in Technical, Humanitarian Opportunities of Service-Learning

The ETHOS Program is founded on the belief that engineers are more apt and capable of serving our world appropriately when they have experienced opportunities that increase their understanding of technology's global linkage with values, culture, society, politics, and economy. ETHOS seeks to provide these opportunities through international service internships as well as through collaborative research and hands-on classroom projects that support the development of appropriate technologies for the developing world.

Such experiences expose students to alternative nontraditional technologies that are based on fundamental science and engineering principles and at the same time provide tangible and immediate impacts improving the lives of those who use them. ETHOS maintains as its educational objective to challenge students to think creatively and independently, to work as a team and communicate effectively, and to address issues of appropriate technology, environmental ethics, social responsibility, and cultural sensitivity.

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## Optional Cooperative Education



Cooperative education offers the student the opportunity to put classroom work into practical use while still in school, resulting in early career identification and greater motivation as well as providing a source of funds. All students majoring in engineering and engineering technology may participate in the cooperative education program. To be eligible, students must have completed three semesters and have a cumulative grade-point average of not less than 2.3. Those applying for the program will be accepted on the basis of grade-point average, motivation, and attitude. The number of students placed depends on the availability of jobs. For more information, visit Cooperative Education in Section X.

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