

# COLLEGE OF ENGINEERING

## REQUIREMENTS

### UNIVERSITY GENERAL EDUCATION REQUIREMENTS

All undergraduate students at the University of Wisconsin–Madison are required to fulfill a minimum set of common university general education requirements to ensure that every graduate acquires the essential core of an undergraduate education. This core establishes a foundation for living a productive life, being a citizen of the world, appreciating aesthetic values, and engaging in lifelong learning in a continually changing world. Various schools and colleges will have requirements in addition to the requirements listed below. Consult your advisor for assistance, as needed. For additional information, see the university Undergraduate General Education Requirements (<http://guide.wisc.edu/undergraduate/#requirementsforundergraduatestudytext>) section of the *Guide*.

General Education	<ul style="list-style-type: none"> <li>• Breadth–Humanities/Literature/Arts: 6 credits</li> <li>• Breadth–Natural Science: 4 to 6 credits, consisting of one 4- or 5-credit course with a laboratory component; or two courses providing a total of 6 credits</li> <li>• Breadth–Social Studies: 3 credits</li> <li>• Communication Part A &amp; Part B *</li> <li>• Ethnic Studies *</li> <li>• Quantitative Reasoning Part A &amp; Part B *</li> </ul>
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\* The mortarboard symbol appears before the title of any course that fulfills one of the Communication Part A or Part B, Ethnic Studies, or Quantitative Reasoning Part A or Part B requirements.

### ENGINEERING CURRICULA

The graduation requirements for each of the engineering degrees are presented in the form of four-year programs of study. These four-year schedules are available, but rarely followed without deviation. Some students can proceed more rapidly; many must proceed more slowly and take nine or more semesters to complete the degree. Flexibility in course selection is also present though elective categories within curricula.

**All engineering curricula are designed to meet all criteria for accreditation by the Engineering Accreditation Commission of ABET, [www.abet.org](http://www.abet.org) (<http://www.abet.org/>). Among other criteria, ABET requires that students complete:**

- A minimum of 30 semester credit hours (or equivalent) of a combination of college-level mathematics and basic sciences with experimental experience appropriate to the program.
- A minimum of 45 semester credit hours (or equivalent) of engineering topics appropriate to the program, consisting of engineering and computer sciences and engineering design, and utilizing modern engineering tools.

- A broad education component that complements the technical content of the curriculum and is consistent with the program educational objectives.
- A culminating major engineering design experience that 1) incorporates appropriate engineering standards and multiple constraints, and 2) is based on the knowledge and skills acquired in earlier course work.

Engineering curricula continuously evolve. The requirements that apply to a particular student are determined by the date (catalog year) that a student enters a degree-granting program. At that point, the curriculum becomes fixed throughout the period it takes for a student to complete the degree, although new changes that benefit a student can be adopted by a particular student if he or she so chooses.

The curricular descriptions below do not address how these requirements are satisfied; students seldom need to be concerned with these details. However, if deviations from a curriculum are requested, they must not violate any of the accreditation requirements.

### DEVIATION FROM PRESCRIBED CURRICULA

Circumstances deemed acceptable for deviating from the outlined engineering curricula are included in each departmental description. The choice of courses to fulfill elective credit requirements provides students with considerable flexibility in their programs. In addition, some departments permit the substitution of elective courses for required ones and also offer outstanding undergraduate students the opportunity to enroll in graduate courses. These options aid the student in tailoring a course of study to meet personal goals more closely.

### DEFINITION OF ELECTIVES

There are general types of elective courses including technical electives, liberal studies and free electives.

**Technical electives** are limited to courses in engineering and closely related fields.

**Liberal studies electives** are those courses that are classified as either humanities, literature, social studies or as foreign language.

**Free electives** are courses completely free of any restrictions or requirements other than the course prerequisites.

Other specific elective requirements are established and described in department curricula.

To assist the student in gaining a better understanding of individuals and societies, and to reduce problems of transferring from one curriculum to another, engineering curricula require adherence to the Liberal Studies Guidelines (see below). Some require slight variations from those guidelines.

### INDEPENDENT STUDY

Students who have high grade point averages may satisfy some elective credits by independent study of subjects or problems suitable for analytical investigative work. The student must identify a professor who is willing to supervise study of interest to the student. Together they must agree upon the work to be done, the credits earned (usually 1-3), and the course number (199, 299, 399, 499, 599, or 699) for which the student is to enroll before the beginning of a semester. Weekly meetings with the professor to discuss questions and report progress are customary.

## LIBERAL STUDIES GUIDELINES

The College of Engineering requires one semester's worth of liberal elective courses in humanities, literature and social science for graduation. The college specifies that students should obtain both **breadth** (i.e., both social science *and* literature or humanities), and **depth** (i.e., more than one course in the same department).

The college has established general liberal elective guidelines that have been adopted by all departments, some of which have additional stipulations (see below).

### FOR ALL ENGINEERING STUDENTS

As a graduation requirement, and to fulfill campus general education guidelines, all engineering undergraduate students must take 15 or 16 credits of liberal electives. These credits must fulfill the following subrequirements.

1. A minimum of two courses from the same subject area (<https://registrar.wisc.edu/subjectarea/>) (the description before the course number). At least one of these two courses must be above the elementary level (i.e., must have I, A, or D level designator), as indicated in Guide (<https://guide.wisc.edu/courses/>).
2. A minimum of 6 credits designated as humanities or literature, and an additional minimum of 3 credits designated as social science. Foreign language courses count as humanities credits.<sup>1</sup>
3. At least one course of at least 3 credits designated as ethnic studies (lower case "e" in the Course Guide). These credits may help satisfy subrequirements 1 or 2 as well, but they count only once toward the total required credits.

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**Exception:** "Retrocredits," which are credits awarded by foreign language departments for successful completion of a higher level course, do not count toward this subrequirement, nor toward the total credits required (15 or 16). They are still helpful: If a student completes one foreign language course at the intermediate level and is awarded retrocredits, then subrequirement 1 above is satisfied because the student is judged to have achieved "depth" in liberal studies.

### ADDITIONAL RESTRICTIONS/ SUBREQUIREMENTS FOR SPECIFIC DEPARTMENTS

**Civil and Environmental Engineering:** An economics course (from an approved list) and an environmental studies course (with approved characteristics) are required.

**Industrial Engineering:** ECON 101 Principles of Microeconomics or ECON 111 Principles of Economics–Accelerated Treatment is required.