

# School of Engineering

Amir Faghri, Ph.D., *Dean, School of Engineering*  
 M. E. Wood, M.S., *Assistant Dean for Undergraduate Education*  
 David Jordan, Ph.D., *Director of Undergraduate Advising*

## Degrees Offered and Accreditation

The School of Engineering offers four-year programs leading to

Bachelor of Science in Engineering (B.S.E.) degrees (134-credits) in

Biomedical Engineering  
 Chemical Engineering\*  
 Civil Engineering\*  
 Computer Science and Engineering\*  
 Computer Engineering  
 Electrical Engineering\*  
 Engineering Physics  
 Environmental Engineering  
 Mechanical Engineering\*  
 Metallurgy & Materials Engineering

Bachelor of Science (B.S.) degree (120-credits) in Computer Science

Bachelor of Science (B.S.) degree (139-credits) in Management & Engineering for Manufacturing (jointly offered with the School of Business)

The BSE programs shown above that are asterisked (\*), are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET). The BSE programs in Environmental Engineering, Computer Engineering, and Metallurgy & Materials Engineering, and the BS program in Management & Engineering for Manufacturing will be submitted for EAC/ABET accreditation at the earliest opportunity. The BSE in Computer Science & Engineering is also accredited by the Computer Science Accreditation Board (CSAB).

The School of Engineering and the College of Liberal Arts and Sciences offer a five-year, double-degree *EUROTECH* program leading to a B.S. degree in Engineering and a B.A. degree in German. The program includes German Language courses specially designed to include engineering content, engineering courses taught partly in German, and a six-month internship in a company in Germany.

Students who wish to concentrate their elective work in a second field within the School of Engineering may elect a double major program. This program requires the completion of all requirements in both majors. Students need the approval of the Director of Advising to change majors.

The School of Engineering also offers Minors in Bioinformatics, in Biomedical Engineering, in Environmental Engineering, in Information Technology, and in Metallurgy & Materials Engineering. Please refer to the "Minors" section of this publication for their descriptions.

**Admission Requirements.** See Admission to the University. All students admitted to the School of Engineering are required to take a placement examination in mathematics and a calculus readiness examination prior to registration for their first semester. Students who make unsatisfactory grades in these examinations may be required to take additional preparatory work that may not be counted toward graduation.

**Admission to Junior Year.** Students should declare their major as soon as possible, but no later than the second semester of their sophomore year. All students, to be admitted to their junior year in their selected major in the School of Engineering, must have a cumulative grade point average of at least 2.0 in all courses in mathematics, physics, chemistry, and engineering applicable toward the degree. For Management & Engineering for Manufacturing majors, the cumulative grade point average requirement also includes Management & Engineering for Manufacturing courses.

**Scholarships.** More than \$450,000 in scholarships and awards is available annually to students in the School of Engineering.

**Faculty Advisors.** Faculty advisors are assigned to students entering the School of Engineering according to a student's major. Advisors assist students in their course selections, counsel them in meeting their educational and career goals, and advise them in non-academic issues.

## School Academic Requirements.

Students in the School of Engineering must complete the following requirements:

### Foreign Language

All students must (1) have passed the third year level in high school in a single foreign language or (2) complete one year (two semesters) of a single foreign language at the college level.

### Expository Writing

ENGL 110 or ENGL 111

### Culture and Modern Society

HIST 100 or HIST 101

### Philosophical or Ethical Analysis

PHIL 104

### Additionally, all majors are required to complete:

- University General Education requirements (see *Academic Requirements*)
- A *Plan of Study* form submitted prior to entering the junior year
- MATH 115Q and 116Q (or MATH 112Q, 113Q, and 114Q), ENGR 100 and CSE 123C
- The University writing (W) course requirement must be met through required major-specific W course work. Most programs have two W courses specified in the curriculum although in some curricula, an equivalent number of Partial Writing (P) courses are required.
- All majors, except BS in Computer Science majors, are required to complete
  - CHEM 127Q (or CHEM 129Q)
  - PHYS 151Q and 152Q
- All majors, except BS in Computer Science and BS in Management & Engineering for Manufacturing majors, are required to complete CHEM 128Q (or 130Q).
- All majors, except BS in Computer Science and BS in Management & Engineering for Manufacturing majors, are required to complete at least *two* courses in one of the departments listed in the General Education Groups 4 through 7. See the "Academic Regulations" section of this *Catalog*. At least *one* of these courses must be at the 200 level. Examples of course selections that meet this requirement are:
  - ANTH106 (Group 7) & ANTH 226 (Group 5)
  - ENGL 210 (Group 4) & ENGL 218 (Group 5)
  - PHIL 104 (Group 6) & PHIL 263 (Group 5)
  - HIST 101 (Group 5) & HIST 281 (Group 5)

**Credit Restrictions.** The following courses may not be counted for credit toward graduation in the School of Engineering: MATH courses numbered 112 and below; MATH 118; PHYS 101 and 103; CSE 101; STAT 100; and courses labeled "independent study" or "variable topics" (e.g. course numbered 298 or 299) taken in departments outside the School of Engineering. No course taken on a Pass/Fail basis may be counted for credit toward graduation or may be used to meet any course requirements of the School of Engineering. Only eight credits of chemistry and physics at the 100's level may be applied toward the degree.

**Major Requirements and Normal Sequences.** In addition to the University General Education requirements and the School requirements listed above, the requirements for the specific majors are listed in the following pages. Full details, normal course sequences, and accreditation requirements can be found in the respective *Guide to Course Selection* for each major.

## Bachelor of Science in Engineering in Biomedical Engineering

Biomedical Engineering majors are required to complete the following:

CE 211  
 BME 210, 221, 251, 252, 261W, 271W, 290, 291  
 CHEM 240, 243  
 ECE 201  
 ENGR 166  
 MATH 210Q, 211Q  
 MMAT 201  
 PNB 264  
 STAT 224Q  
 Professional Requirements (15 credits)  
 Elective Courses (4 credits)

The professional requirements and electives are specified in the *Biomedical Engineering Guide to Course Selection*.

### Bachelor of Science in Engineering in Chemical Engineering

Chemical Engineering majors are required to complete the following:

CE 211  
CHEG 203, 211, 212, 223, 224, 237W, 239W, 243, 247, and 251  
CHEG Electives (6 credits minimum)  
CHEM 240, 243, 244, 256, 263Q, and 264Q\*  
ENGR 166  
MATH 210Q and 211Q  
Professional Requirements (12 credits)  
Elective courses (5 credits)

\*Students may select CHEM 232Q, MCB 203, MCB 204 or MCB 229 as a replacement for CHEM 264Q.

Selection of Professional Requirements courses must include engineering design work as detailed in the *Chemical Engineering Guide to Course Selection*. At least three credits of Professional Requirements must be outside of Chemical Engineering.

### Bachelor of Science in Engineering in Civil Engineering

Civil Engineering majors are required to complete the following:

CE 211, 212, 222P or 262P, 234 or 260, 236, 240P, 254, 263, 271, 280W, 281, 287, 291, and 297  
ECE 220 and ME 233  
ENGR 166  
MATH 210Q and 211Q  
Professional Requirements courses (18 credits)  
Elective courses (9 credits)

CE 291 must be taken twice before CE 280W. Professional Requirements include one course each from two of these four technical areas:

*Environmental and Water Resources Engineering* - CE 260, 262, 265, 266, 267, 268 and 279  
*Geotechnical Engineering* - CE 241 and 242  
*Structural Engineering* - CE 222, 234, 237, 238, and 239  
*Transportation Engineering* - CE 251, 255, 256, 275 and 276

The Professional Requirements must satisfy engineering design credit and other distribution requirements as specified in the *Civil Engineering Guide to Course Selection*.

### Bachelor of Science in Engineering in Computer Engineering

Offered jointly by the Departments of Computer Science & Engineering and Electrical & Computer Engineering

Computer Engineering majors are required to complete the following:

CE 211  
CSE 124C, 207, 208W, 221, 233, 243, 254, and 258  
ECE 201, 202, 204, 209W, and 242  
Cross-listed courses CSE/ECE 252, 257, 290, and 291  
MATH 210Q, 211Q, and 227Q  
STAT 224Q  
Professional Requirements courses (12 credits)  
Design Laboratory courses (6 credits)  
Elective courses (3 credits)

Further details and course sequences are given in the *Computer Engineering Guide to Course Selection*.

### Bachelor of Science in Computer Science

Computer Science majors are required to complete the following:

CSE 124C, 201, 230, 237, 254, 258 and 259  
MATH 227Q, and either 210Q or 211Q  
One of MATH 231Q, STAT 220Q, 224Q, or 230Q  
One two-semester laboratory course sequence from either chemistry (CHEM 127Q - 128Q, 129Q - 130Q, or 137Q - 138Q) or physics (PHYS 131Q - 132Q, 141Q - 142Q, or 151Q - 152Q)  
One additional science course (from BIOL 107Q, 108Q, or 110Q;

CHEM 127Q, or 128Q; GEOL 102; PHYS 131Q, 132Q, 141Q, 142Q, 151Q, or 152Q) but not in the same department as the two-semester sequence

One course from each of the three following groups:

*Computer Applications* - CSE 255, 275, or 282

*Computer Architecture* - CSE 228, 240 or 245

*Computer Languages* - CSE 233 or 244

Two courses from CSE 261, 262, 263, 265, 268, and 269

CSE 200-level courses (6 credits)

A minimum of three 3-credit courses at the 200-level in a single related area forming a cohesive body of knowledge outside of Computer Science

Further details and course sequences are given in the *Computer Science Guide to Course Selection*.

### Bachelor of Science in Engineering in Computer Science and Engineering

Computer Science & Engineering majors are required to complete the following:

CE 211  
CSE 124C, 207, 208W, 221, 228, 230, 237, 243, 244, 254, 258, and 259  
Two CSE design laboratory courses  
MATH 210Q, 211Q, and 227Q  
One of MATH 231, STAT 220Q, 224Q, or 230Q  
ECE 201, 202, and 209W  
Professional Requirements courses (9 credits)  
Elective courses (9 credits)

Further details and course sequences are given in the *Computer Science & Engineering Guide to Course Selection*.

### Bachelor of Science in Engineering in Electrical Engineering

Electrical Engineering majors are required to complete the following:

CE 211  
CSE 207, and 208W  
ECE 201, 202, 204, 205, 209W, 232, 240, 241, 245, 261, and 262W  
CSE/ECE 290 and 291  
ENGR 166 or CSE 124C  
MATH 210Q and 211Q  
STAT 224Q  
Professional Requirements courses (12 credits)  
Design Laboratory courses (6 credits)  
Elective courses (7-8 credits)

Further details and course sequences are given in the *Electrical Engineering Guide to Course Selection*.

### Bachelor of Science in Engineering in Engineering Physics

Offered jointly by the Physics Department of the College of Liberal Arts and Sciences and the School of Engineering

Engineering Physics majors can concentrate in either Electrical, Mechanical or Metallurgy and Materials Engineering. Students must satisfy the course requirements of both the College of Liberal Arts and Sciences and the School of Engineering to complete this degree.

Engineering Physics majors are required to complete the following:

PHYS 230Q, 242Q, 255Q, 257Q, 258Z, 261Q, 285Z  
ENGR 295 (4 credits)  
MATH 210Q, 211Q, and 272Q  
*Electrical Engineering* - ECE 201, 202, 204, 209W, 228, 229, 232, 241, 245, and 261; CSE 207 and 208W; MATH 227Q; PHYS 271Q; STAT 224, Elective courses (2 credits).  
*Mechanical Engineering* - ME 220, 227, 233, 234, 242, 250 and 253; CE 211, 287; STAT 224; ME Elective Courses (6 credits); PHYS Elective courses (3 credits); Elective Courses (6 credits).  
*Metallurgy and Materials Engineering* - MMAT 243, 244, 255, 256, 265, 266, 267, 283 and 286W; CHEG 256; PHYS 273Q and 281Q; MMAT Elective Courses (6 credits); Elective Courses (3 credits).

The professional requirements and electives are specified in the *Engineering Physics Guide to Course Selection*.

## Bachelor of Science in Engineering in Environmental Engineering

Environmental Engineering majors are required to complete the following:

CE 211, 251, and 263 (or ENVE 263)  
ANSC 226  
CHEG 211, 212, 223, 224, and 285  
EEB 244W  
ENGR 166  
ENVE 110, 260 (or CHEG 281), 262, 265 or 267, 270, 279, 290W, 291W,  
and 296  
MATH 210Q and 211Q  
MCB 229

Professional Requirements courses (9 credits)

Professional Requirements include at least *one* course each to strengthen *three* of the following eight focus areas: Atmospheric Systems & Air Pollution Control, Environmental & Occupational Health, Environmental Chemistry, Environmental Systems Modeling, Hazardous Waste Management, Solid Waste Management, Water Supply & Resources, and Wastewater Management. The following courses may be used to meet the Professional Requirements:

ARE 234, and 235  
EEB 238, and 247  
MCB 203, 235, and 240  
CHEG 247, 251, 280, and 283  
CHEM 141, 232Q, 263Q - 264Q, 270W  
CE 265, 268  
GEOG 205, 206, 215, 237, and 286  
GEOL 206, 234C, and 245  
IMGT 210  
MARN 244, and 280W  
ME 239  
NRME 204, 210, 236Q, 237, 239, 240, 260P, and 263  
PHAR 150  
SOCI 259W  
PLSC 259C or ENVE 259C

The Professional Requirements are specified in the *Environmental Engineering Guide to Course Selection*.

## Bachelor of Science in Management and Engineering for Manufacturing

Offered jointly by the School of Business  
and the School of Engineering

Management & Engineering for Manufacturing majors are required to complete the following:

ACCT 131 and 200  
ANTH 100 or GEOG 160  
BLAW 271  
CE 211, 212, and 287  
ECON 113  
ECE 220  
FNCE 201  
HIST 101  
MATH 210Q and 211Q  
ME 221, 222, 227, 233, and 260W  
MEM 151, 210, 211, 215W, 221, 225, and 231  
MGMT 201, and 290  
MKTG 201  
MMAT 201  
OPIM 252  
STAT 110V  
Technical Electives courses (6 credits)

The Technical Electives course must be 200-level or higher listed in the departments listed in the School of Business and the School of Engineering as specified in the *Management & Engineering for Manufacturing Guide to Course Selection*. Students are encouraged to seek faculty-supervised manufacturing

summer internships prior to their junior and senior years. Such internships may be shown on the student records by registering for MEM 296 – Manufacturing Internship, with instructor and advisor approval.

## Bachelor of Science in Engineering in Mechanical Engineering

Mechanical Engineering majors are required to complete the following:

CE 211, 212, and 287  
ECE 220  
ENGR 166  
MATH 210Q and 211Q  
ME 205, 220, 227, 233, 234, 242, 250, 253, 255, 260W, 262, 272P,  
and 273P  
MMAT 201, and 202  
ME Requirement (6 credits)  
Professional Requirements (6 credits)  
Electives (6 credits)

Details on the ME and Professional Requirements are specified in the *Mechanical Engineering Guide to Course Selection*.

## Bachelor of Science in Engineering in Metallurgy and Materials Engineering

Metallurgy & Material Engineering majors are required to complete the following:

CE 211, 212, and 287  
MATH 210Q and 211Q  
MMAT 243, 244, 255, 256, 265, 266, 267, 276, 277, 283, 284, 285W, 286W,  
287, and 288  
ME 233 or CHEM 263Q  
ENGR 166  
ECE 220  
CHEG 256  
Professional Elective courses (9 credits from EE 246, ME 217, and 228, and  
MMAT 206, 207, 217, 219, 229, 232, 234, 236, and 238)  
Technical Elective courses (6 credits from BIOL 107; CHEM 243, 244, 263Q,  
and 264Q; MCB 203; ME 218, 253, and 255; MATH 214Q, 215Q, 227Q,  
and 231Q; PHYS 216Q, and 262Q; and STAT 220Q, 221Q, and 224Q)  
Elective courses (2 credits)

Selection of courses is detailed in the *Metallurgy & Materials Engineering Guide to Course Selection*.

School of Engineering Website

<http://www.engr.uconn.edu/>