

# School of Engineering

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## 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 and the BS in Computer Science are 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 and 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 and Engineering for Manufacturing courses.

**Scholarships.** More than \$650,000 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 (CHEM courses 127Q through 138Q) and only eight credits of physics (PHYS courses 121Q through 152Q) 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 243  
 ECE 201  
 ENGR 166  
 MATH 210Q, 211Q  
 MMAT 201 or 243  
 PNB 264  
 STAT 220Q  
 Professional Requirements (15 credits)

## Elective Courses (5 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 201, 211, 212, 222P or 262P, 234 or 260, 236, 240P, 254, 263, 271, 280W, 287, 291, and 297
- ECE 220 and ME 233
- ENGR 166 (section offered by the CE Department recommended)
- MATH 210Q and 211Q
- Professional Requirements courses (18 credits)
- Elective courses (9 credits)
- CE 291 must be taken twice before CE 280W.

To satisfy professional requirements, students must take at least one course each from four of the following different technical areas:

- Construction Management Engineering* - CE 202
- Environmental/Sanitary Engineering* - CE 260, 279 (CE 260 may be used only to fill the professional requirements by students who have taken CE 234)
- Geotechnical Engineering* - CE 241, 242
- Hydraulic/Water Resources Engineering* - CE 265, 267
- Structural Engineering* - CE 238, 239
- Surveying Geodetic* - CE 276
- Transportation Engineering* - CE 255

Courses taken from the above list but not used to fulfill the four technical area requirements may be used to satisfy remaining professional requirements. In addition, the following courses may also be considered for remaining professional requirements: CE 237, 268, 266, CE 222P or 262P (if both taken), CE 234 or 260 (if both taken).

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, 230, 243, 254, 258
- ECE 201, 202, 204, 209W, 215, 242, 249, 252, 290, 291
- MATH 210Q, 211Q, and 227Q
- STAT 224Q
- Professional Requirements courses (9 credits)
- Design Laboratory courses (6 credits including ECE 266 or CSE 268)

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, 259, and 293
- MATH 227Q, and either MATH 210Q or 211Q
- Either STAT 220Q or STAT 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.
- Either CSE 233 or CSE 244
- Three courses from CSE 228, 255, 257, 275, 282
- One course from CSE 262, 265, 268, and 269
- Two other 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 and 263 (or ENVE 263)

ANSC 226

CHEG 211, 212, 223, 224, and 285 (or ENVE 285)

EEB 244W

ENGR 166

ENVE 110, 201 (or CE 201), 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 and Occupational Health, Environmental Chemistry, Environmental Systems Modeling, Hazardous Waste Management, Solid Waste Management, Water Supply and 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

OPIM 210

MARN 244, and 280W

ME 239

NRME 204, 210, 236Q, 237, 239, 240, 260P, and 263

PHAR 150

SOCI 259W

PLSC 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 102

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 must be 200-level or higher courses from 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 and Material Engineering majors are required to complete the following:

ENGR 166

MATH 210Q and 211Q

CE 211 and 287

MMAT 234, 236/W, 243, 244, 255, 256, 265, 266, 267, 276, 277, 284, 285, 286, 287, and 288

ME 233 or CHEM 263Q

ECE 220

CHEG 256

Recommended Professional Elective courses - 9 credits from:

BME 271; ECE 246; ME 217 and 228; and MMAT 207, 219, 229, 234, 238, and 267

Technical Elective courses - 6 credits from:

BIOL 107; CHEM 243, 244, and 264Q; MCB 203; ME 218, 253, and 255; MATH 214Q, 215Q, 227Q, and 231Q; PHYS 216Q and 262Q; STAT 220Q, 221Q, and 224Q

Elective courses - 2 credits

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

**School of Engineering Website**

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