

Major Programs

Major: Biological Engineering (BE)

Accredited by ABET (see inside front cover.)

Offered by: **Department of Biological and Environmental Engineering**

207 Riley-Robb Hall, 255-2173, www.bee.cornell.edu

Program objectives

The educational objectives of the Biological Engineering Major are consistent with those of the College of Engineering and Cornell University. We are committed to providing a top-level undergraduate engineering program in a nurturing learning environment where our graduates acquire knowledge and develop skills for professional success.

The Educational Program Objectives of Biological Engineering are to:

1. Produce graduates who pursue careers related to Biological Engineering based on a solid educational background in appropriate mathematics, physical and life sciences, liberal studies, and engineering.
2. Produce graduates who pursue advanced degrees in engineering and related professional fields.
3. Produce graduates who assume leadership positions and contribute to solutions of societal problems involving complex biological and environmental systems.

Engineering Distributions

ENGRD 202	Mechanics of Solids (required)
ENGRD 2XX	ENGRD 260 (recommended)

Required Major Courses

BIO G 101-104	Biological Principles ¹
BIO BM 330 or 333 or BIOMI 290 or CEE 451	Biochemistry or Microbiology
BIO XXX	Biological Science course(s) + 200
CHEM 257 or 357	Organic Chemistry
BEE 151 or COM S 100M	Introduction to Computing
ENGRG 150 or BEE 200	Undergraduate Seminar
BEE 260/ENGRD 260	Principles of Biological Engineering
Or BEE 251/ENGRD 251	Engineering for a Sustainable Society
BEE 350	Biological and Environmental Transport Processes
BEE 360	Molecular and Cellular Bioengineering
or CEE 351	Environmental Quality Engineering
BEE 222 or ENGRD 221	Thermodynamics
CEE 304 or ENGRD 270	Engineering Statistics and Probability
CEE 331, M&AE 323, or CHEM 323	Fluid Mechanics
BEE 365, 427, 450, or 454, 459 or CEE 453	Engineering Laboratory Experience
BEE 450-489	three courses

¹May substitute BIO G 105 and 106 or BIO G 109 and 110.

Electives

Fourteen credits of Major-approved engineering science courses are required, 3 of which must be a BEE technical elective course. The requirements for premedical study can be met with an additional 9 credit hours if courses are carefully selected.

At least one upper-level or approved-elective course must be a BEE Capstone Course.

The BE Major satisfies the Bioengineering Option if ENGRG 501 is taken.

BIOLOGICAL ENGINEERING MAJOR (BE)

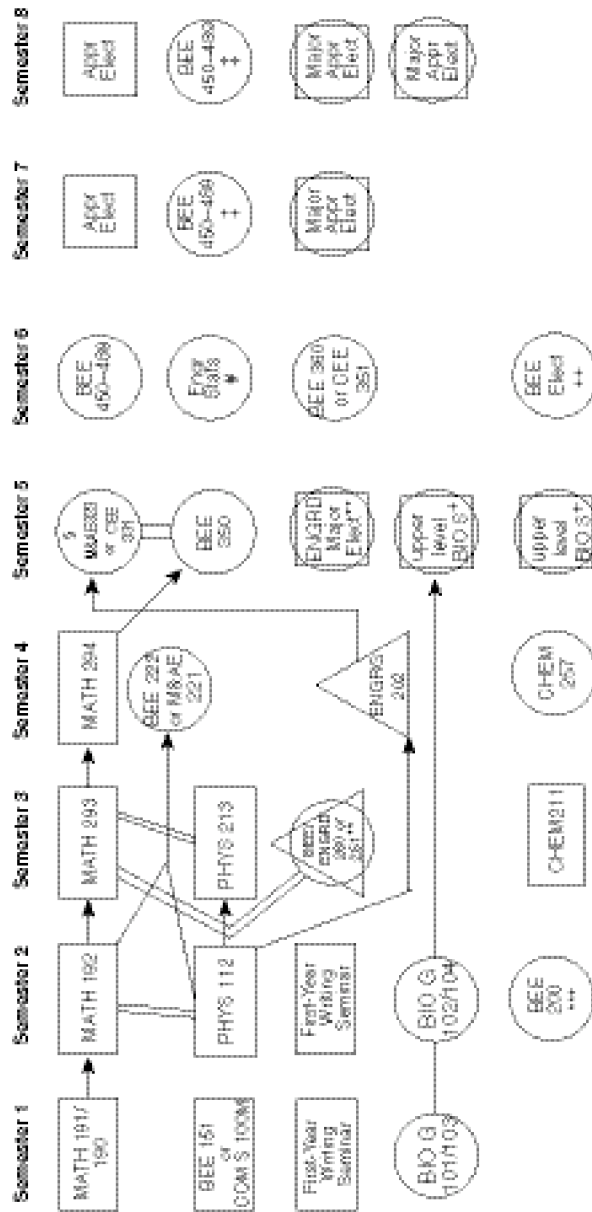
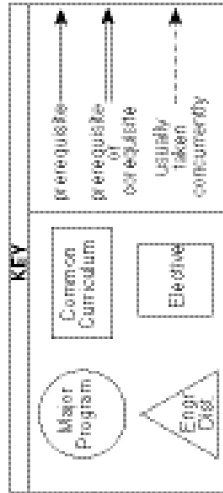
* Students may substitute BIO G 105-405 or BIO 109-110. Introductory biology should be completed by the end of the sophomore year.

5 ENGRD 200 required for students planning to take BIOME 303.

9 COME 270 (Fall, Spring) or CEE 304 (Fall).

** BEE/ENGRD 260 is used as an engineering distribution, a fourth major approved technical elective must be taken.

--- Required of CALS mathematics only; engineering students complete ENGRG 100.



+ Upper Level BIO S - Need to take either Biochemistry or Microbiology - BIO BI6 350, or BIO BI6 353 or BIO BI6 355 or BIO BI6 357, or BIO BI6 359, or BIO BI6 360, or CEE 451

++ One of the BEE electives must be Lab Experience

† One of the 450 - 499 must be Capstone

Biological Engineering Major Checklist

	Min. Credit Hours	✓ When Done
MATH 191 (or 190)	4	n
MATH 192	4	n
MATH 293	4	n
MATH 294	4	n
CHEM 211 (or 207 or 215)	4	n
CHEM 257 (or 357)	3	n
PHYS 112	4	n
PHYS 213	4	n
BEE 151 (or COM S 100M)	4	n
Intro. to Engr. (not required of CALS-Matriculating BE students)†	0	n
Engr. Dist. 1: ENGRD 202	4	n
Engr. Dist. 2: (ENGRD 260 recommended**)	3	n
First-Year Writing Seminar 1‡	3	n
First-Year Writing Seminar 2	3	n
Liberal Studies Distribution—6 courses (18-credit minimum)§		
Lib. Studies 1		n
Lib. Studies 2		n
Lib. Studies 3		n
Lib. Studies 4		n
Lib. Studies 5		n
Lib. Studies 6		n
Approved Elective (2 courses; 6-credit minimum)		n
Approved Elective		n
Physical Education (2 semesters) and swim test		n
Required Major Courses (54-credit minimum)#		
BIO G 101/103 (or 109)	4	n
BIO G 102/104 (or 110)	4	n
BIOBM 330 or 333 or BIOMI 290 or CEE 451	4	n
BIO XXX (upper-level biology)	3	n
ENGRG 150 or BEE 200++	1	n
BEE/ENGRD 260 or BEE/ENGRD 251**	3	n
BEE 360 or CEE 351	3	n
BEE 350	3	n
BEE 222 or ENGRD 221	3	n
CEE 304 or ENGRD 270	3	n
CEE 331 or M&AE 323 or CHEME 323	4	n
BEE 365, 427 or 450, or 454, 459 or CEE 453	3	n
BEE 450-489	3	n
BEE 450-489	3	n
BEE 450-489	3	n
Major-Approved Technical Electives	7	n
Total Required Credits	126 min.	_____
Additional Elective Courses (0 credits min., no max.)		n

†BE satisfies the intro to engineering course and credit requirement through a sequence of courses in the Major. An ENGR1 course is not required of CALS matriculating students.

‡In addition to the first-year writing seminars, a technical writing course must be taken as an engineering distribution, liberal studies, approved elective, or Major course.

§Approved courses must be chosen from at least three of the following six groups: (1) Cultural Analysis (CA), (2) Historical Analysis (HA), (3) Literature and the Arts (LA), (4) Knowledge, Cognition, and Moral Reasoning (KCM), (5) Social and Behavioral Analysis (SBA), (6) Foreign Languages (not literature courses). At least two courses must be from the first three groups (CA, HA, LA). At least two of the six courses must be at 200-level or higher.

#The 9 credits of Major-complementary courses are ENGRD 202, CEE 304, or ENGRD 270, and M&A E 323, CEE 331, or CHEME 323.

**If BEE/ENGRD 260 is used as an engineering distribution, an additional Major-approved technical elective must be taken.

++BE students matriculating in CALS take BEE 200. Engineering students take ENGRG 150 prior to affiliating with BE.