

# BIOLOGICAL ENGINEERING

**Sample Program** for Biological Engineering which meets requirements for the **Biomedical Eng Minor** and **pre-med study**  
**(Applies to students matriculating in the Fall Semester of 2018 or later;**  
**for rules see the notes section on respective pages.)**

**Name:** \_\_\_\_\_ **Empl ID:** \_\_\_\_\_ **Last Revised:** 2/15/2019  
**E-mail:** \_\_\_\_\_ **Advisor:** \_\_\_\_\_ **Double Major:** \_\_\_\_\_  
**Minor:** \_\_\_\_\_ **Antic. Grad Date:** \_\_\_\_\_

| Course Title and<br>Required Credits   | Course                                       | Grade | Credit<br>Hours | Total<br>Credits |
|--|--|-------|-----------------|------------------|
| <b>1. Mathematics:</b> 16 credits  |  |       |                 |                  |
| Calculus for Engineers*  | MATH 1910 <sup>a</sup>                       | _____ | 4               |                  |
| Calculus for Engineers*  | MATH 1920 <sup>a</sup>                       | _____ | 4               |                  |
| Engineering Math* (Diff. Equations)  | MATH 2930                                    | _____ | 4               |                  |
| Engineering Math* (Linear Algebra)   | MATH 2940                                    | _____ | 4               | 16               |
| <b>2. Physics:</b> 8 credits   |  |       |                 |                  |
| Mechanics  | PHYS 1112                                    | _____ | 4               |                  |
| Heat/Electromagnetism  | PHYS 2213                                    | _____ | 4               | 8                |
| Pre-medical students may petition the College of Engineering to substitute PHYS 2208 |  |       |                 |                  |
| <b>3. Chemistry:</b> 7 credits   |  |       |                 |                  |
| General Chemistry  | CHEM 2070 or 2090 <sup>a</sup>               | _____ | 4               |                  |
| Organic Chemistry  | CHEM 3570 <sup>a</sup>                       | _____ | 3               | 7                |
| Chem II and O-Chem II are counted in number 9  |  |       |                 |                  |
| <b>4. Biological Sciences:</b> 15 credits  |  |       |                 |                  |
| Introductory Biological Science <sup>a,d</sup>                                       | BIOG 1440 <sup>b</sup>                       | _____ | 3               |                  |
| Introductory Biological Science <sup>a,d</sup>                                       | BIOEE/BIOSM 1610 or BIOMG 1350               | _____ | 3               |                  |
| Introductory Bio Lab <sup>d</sup>  | BIOG 1500                                    | _____ | 2               |                  |
| Biochemistry (BIOBM 3300 <sup>b</sup> or 3310-3320 recommended)                      |  | _____ | 4-5             |                  |
| BIOMG 3300 (4) or 3330 (4) or 3310+3320 (5)  |  | _____ | 3-5             |                  |
| Advanced Biol. Sci. Elective (to complete 15 cr)                                     |  | _____ | 3-5             |                  |
| Microbiology/Micro Lab (both recommended) or   | BIOMI 2900/2910 <sup>a,b</sup>               | _____ |                 |                  |
| Behavior/Neurobiology or   | BIONB 2210 <sup>a</sup> /2220 <sup>a,b</sup> | _____ |                 |                  |
| Physiology/Histology   | BIOAP 3110 <sup>a,b</sup> /4130 <sup>a</sup> | _____ |                 | 15-18            |
| <b>5. First Year Writing Seminars (FWS):</b> 6 credits                               |  |       |                 |                  |
|  |  | _____ | 3               |                  |
|  |  | _____ | 3               | 6                |

**6. Liberal Studies:** 18 credits (Minimum of six courses in at least three of the seven groups; at least two of the six courses at or above 2000 level.)

- (1) Cultural Analysis (CA)
- (2) Historical Analysis (HA)
- (3) Literature and the Arts (LA)
- (4) Knowledge, Cognition and Moral Reasoning (KCM)
- (5) Social & Behavior and Analysis (SBA)
- (6) Foreign Languages (not literature) (FL)
- (7) Communications in Engineering (CE)

| Course Title | Course # | Category | Grade | Credits |
|--------------|----------|----------|-------|---------|
|              |          |          |       | 3       |
|              |          |          |       | 3       |
|              |          |          |       | 3       |
|              |          |          |       | 3       |
|              |          |          |       | 3       |
|              |          |          |       | 3       |

Name: 0

7. **Computer Programming:** 4 credits

Intro to Computer Programming CS 1112

4 4

8. **Engineering Distribution and Field Courses:** 48 credits

(a) *Required Courses*

Mechanics of Solids ENGRD 2020<sup>c</sup>  
Engineering Statistics and Probability CEE 3040 or ENGRD 2700

4  
3-4

(b) *Required Biological Engineering Core Courses*

Intro to Engineering ENGRI 1XXX  
Thermodynamics (recommended) BEE 2220  
Engineering Distribution BEE/ENGRD 2600  
Bio-Fluid Mechanics BEE 3310  
Design and Analysis of Biomaterials BEE 3400  
Heat and Mass Transfer in BioEng BEE 3500  
Molecular and Cellular BioEng **BEE 3600<sup>b</sup>**  
Bioinstrumentation BEE 4500

3  
3  
3  
4  
3  
4  
3  
3-4

(c) *Biological Engineering Focus Area Electives*

15 or more credits of courses chosen from 1 or more of the 7 focus areas to complete the 48 engineering credits

Com-Aided Engineering **BEE 4530<sup>b</sup>**  
Biomed Materials & Their Applications **MSE 4610<sup>b</sup>**  
Biomed Eng Analys of Metabolic & Struct BME 4010  
Biomedical Engineering BME 4810  
Undergraduate Research BEE 4990

3  
3  
3  
3  
3

48-50

9. **Advisor Approved Electives:** 6 credits

General Chemistry II CHEM 2080<sup>a</sup>  
Organin Chemistry II, O Chem Lab CHEM 3580<sup>a</sup>/2510<sup>a</sup>

4  
5

9

**GRAND Total Credits:**

131-136  
(Minimum 128)

BEE 4530 Technical Writing Course  
BEE 4530 Capstone Design Course  
EHS Online Lab Safety Training (2555)  
BEE 1200 (CALS freshman)  
ENGRG 1050 (ENG freshman)  
PE  
PE

<sup>a</sup>Course satisfying pre-medical requirements.

<sup>b</sup>Red highlighted courses satisfy the Biomedical Engineering Minor.

<sup>c</sup>Engineering distribution requirement is satisfied by ENGRD 2020 and ENGRD 2600.

<sup>d</sup>Choose BIOG 1440, BIOEE 1610 or BIOMG 1350 plus BIOG/BIOSM 1500.

<sup>e</sup>Some medical schools are requiring one term of organic chem and one term of biochem instead of 2 terms of O-chem and O-chem lab.