EXECUTIVE
COMMITTEE COLLEGE
OF ENGINEERING
REPORT TO THE RIVERSIDE
DIVISION
NOVEMBER 30, 2021

To be adopted:

Proposed Changes to Bioengineering

PRESENT:

PROPOSED:

1. Lower-division requirements (84 units)
 a) BIEN 001, BIEN 010
 b) BIOL 005A, BIOL 05LA, BIOL 005B
 c) CHEM 001A, CHEM 001B, CHEM
001C, CHEM 01LA, CHEM 01LB, CHEM
01LC (or CHEM 01HA, CHEM 01HB,
CHEM 01HC, CHEM 1HLA, CHEM
1HLB, CHEM 1HLC), CHEM 008A,
CHEM 008B, CHEM 08LA, CHEM 08LB,
(or CHEM 08HA, CHEM 08HB, CHEM
08HLA, CHEM 08HLB)
 d) ~~CS 010A~~
 e) ~~EE 001A~~, ~~EE 01LA~~
 f) MATH 009A, MATH 009B, MATH 009C,
(or MATH 09HA, MATH 09HB, MATH
09HC) MATH 010A, MATH 010B, MATH
046
 g) PHYS 040A, PHYS 040B, PHYS 040C

1. Lower-division requirements (84 units)
 a) [no change]
 b) [no change]
 c) [no change]

 d) <u>CS 009P</u>
 e) <u>EE 005</u>
 f) [no change]

 g) [no change]

2. Upper-division requirements (70 units)
 a) BIEN 101
 b) BIEN 105, BIEN 110, BIEN 120, BIEN
125, BIEN 130, BIEN 130L, BIEN 135, BIEN
140A/CEE 140A, BIEN 155, BIEN
175A, BIEN 175B~~.~~ BIEN 175C
 c) BIEN 115
 d) ~~STAT 155~~
 e) Technical electives (16 units): BIEN 136/
MSE 136, BIEN 137, BIEN 138, BIEN
140B/CEE 140B, BIEN 142, BIEN 159/
CEE 159, BIEN 160, BIEN 165, BIEN 166,
BIEN 167

2. Upper-division requirements (70 units)
 a) [no change]
 b) [no change]

 c) [no change]
 d) <u>BIEN 111</u>
 e) [no change

Justification:

Computer Science course requirement: We require BIEN majors to take a one-quarter computer programming class from the Computer Science and Engineering department. We have been encouraged by that department to remove our current requirement of CS010A (*Introduction to Computer Science for Science, Mathematics, and Engineering I*) because it is the first in a three-part series and is intended for students taking all three. They recommend substitution with their one-quarter CS009P course (*Introduction to Programming* using the Python programming language). We agree that CS009P is a satisfactory computer programming course for our students.

Electrical Engineering course requirement: We require BIEN majors to take a one-quarter electronic circuits class from the Electrical and Computer Engineering department. We have been encouraged by that department to remove our current requirement for three reasons: (1) ECE has voted to change EE1A/EE1LA to EE30A/EE30LA; (2) ECE intends EE1A/EE1LA (EE30A/EE30LA) to be the first in a sequence of courses and is intended for students taking all three; and (3) ECE recently created EE005, which provides a one-quarter overview of electric and electronic circuits. We agree that EE005 is a satisfactory electronic circuits course for our students. Since EE005 is 4 units and includes a laboratory component, the total number of required units for BIEN majors is unchanged by this substitution.

Statistics course requirement: We require BIEN majors to take a one-quarter class on probability and statistics. We have found that the current class used to satisfy this requirement, STAT 155 (*Probability and Statistics for Science and Engineering*) provides a broad overview of statistics but does not cover statistical methods and topics typically encountered in bioengineering and biomedicine, such as (a) random variables and probability distributions, (b) statistical inference and null hypothesis significance testing, (c) Bayesian and nonparametric statistical testing, and (d) research design/execution for bioengineering applications. BIEN 111 (*Advanced Statistical Methods and Research Design for Bioengineering*) covers these bioengineering- and biomedicine-relevant statistical topics and will provide a superior training in statistics for Bioengineering majors.

Approvals:
Approved by the faculty of Bioengineering Department: February 23, 2021
Approved by the Executive Committee of the College of Engineering: May 14, 2021
Approved by the Committee on Educational Policy: June 30, 2021