

# Biological Engineering B.S.B.E. with Environmental Concentration

## Biological Engineering B.S. with Environmental Concentration Eight-Semester Degree Program

The Bachelor of Science in Biological Engineering with Environmental Concentration program is eligible for students who want to participate in an Eight Semester Degree Program. See the Eight-Semester Degree Policy for more details. The plan below lists a semester-by-semester sequence of courses to finish the degree in eight semesters. State minimum core courses for engineering are listed at the bottom of this page. Students may submit a maximum of 4 hours of "D" in BENG courses for their degree.

Some courses are not offered every semester, so students who deviate from the suggested sequence must pay careful attention to course scheduling and course pre-requisites.

First Year	Units	
	Fall	Spring
GNEG 11101 Introduction to Engineering I	1	
ENGL 10103 Composition I (ACTS Equivalency = ENGL 1013) (Satisfies General Education Outcome 1.1)	3	
CHEM 14103 University Chemistry I (ACTS Equivalency = CHEM 1414 Lecture)	3	
MATH 24004 Calculus I (ACTS Equivalency = MATH 2405) (Satisfies General Education Outcome 2.1)	4	
U.S. History or Government Elective - Choose one course from the following (Satisfies General Education Outcomes 3.3 and 4.2):	3	
HIST 20003 History of the American People to 1877 (ACTS Equivalency = HIST 2113)		
or HIST 20103 History of the American People, 1877 to Present (ACTS Equivalency = HIST 2123)		
or PLSC 20003 American National Government (ACTS Equivalency = PLSC 2003)		
GNEG 11201 Introduction to Engineering II	1	
ENGL 10303 Technical Composition II (ACTS Equivalency = ENGL 1023) (Satisfies General Education Outcome 1.2)	3	
Freshman Engineering Science Elective	4	
CHEM 14203 University Chemistry II (ACTS Equivalency = CHEM 1424 Lecture)		
& CHEM 14201 University Chemistry II Laboratory (ACTS Equivalency = CHEM 1424 Lab)		
or BIOL 10103 and BIOL 10101		
MATH 25004 Calculus II	4	

PHYS 20304 University Physics I (ACTS Equivalency = PHYS 2034)		4
Year Total:	14	16

Second Year	Units	
	Fall	Spring
BENG 26302 Biological Engineering Design Studio	2	
MATH 26004 Calculus III	4	
Sophomore Science Elective (whichever has not been taken)	4	
CHEM 14203 University Chemistry II (ACTS Equivalency = CHEM 1424 Lecture)	4	
& CHEM 14201 University Chemistry II Laboratory (ACTS Equivalency = CHEM 1424 Lab)		
or BIOL 10103 and BIOL 10101		
MEEG 20003 Statics	3	
PHYS 20404 University Physics II (ACTS Equivalency = PHYS 2044 Lecture)	4	
BENG 26403 Biological Engineering Methods I		3
MATH 25804 Elementary Differential Equations		4
BIOL 20003 General Microbiology (ACTS Equivalency = BIOL 2004 Lecture)		4
& BIOL 20001 General Microbiology Laboratory (ACTS Equivalency = BIOL 2004 Lab)		
MEEG 24003 Thermodynamics		3
or CHEG 23103 Thermodynamics of Single-Component Systems		
Social Science Elective - Choose one course from the list below (Satisfies General Education Outcome 4.1) <sup>1</sup>		3
Year Total:	21	17

Third Year	Units	
	Fall	Spring
BENG 36503 Global Bio-Energy Engineering	3	
BENG 36603 Biological Engineering Methods II	3	
BENG 37303 Transport Phenomena in Biological Systems	3	
Choose one:	4	
CHEM 36053 Organic Chemistry I		
& CHEM 36051 Organic Chemistry I Laboratory		
CHEM 26103 Organic Physiological Chemistry (ACTS Equivalency = CHEM 1224 Lecture)		
& CHEM 26101 Organic Physiological Chemistry Laboratory (ACTS Equivalency = CHEM 1224 Lab)		
CVEG 32103 Hydraulics	3	
or MEEG 35003 Mechanics of Fluids		
or CHEG 21303 Fluid Mechanics		
BENG 37203 Unit Operations in Biological Engineering		3
BENG 31103 Measurement and Control for Biological Systems		3
CVEG 32203 Hydrology		3
Biological Elective (Environmental, choose from a list maintained by the department.)		3

Engineering Elective (Environmental), must choose:		3
CVEG 32403 Environmental Engineering		
Year Total:	16	15

Fourth Year	Units	
	Fall	Spring
BENG 48102 Senior Biological Engineering Design I	2	
BENG 48301 Biological Engineering Professionalism	1	
BENG 47403 Food and Bio-Product Systems Engineering	3	
BENG 49303 Sustainable Watershed Engineering	3	
Humanities Elective - Choose one course from the list below (Satisfies General Education Outcomes 3.2 and 5.1) <sup>2</sup>	3	
Social Science Elective - Choose any course listed on the State Minimum Core.	3	
BENG 48203 Senior Biological Engineering Design II (Satisfies General Education Outcome 6.1)		3
BENG 46603 Sustainable Biosystems Designs		3
Technical Elective (Environmental), must choose: CVEG 42403 Environmental Engineering Design		3
Fine Arts Elective - Choose one course from the list below (Satisfies General Education Outcome 3.1): <sup>3</sup>		3
Social Science Elective - Choose any course listed on the State Minimum Core.		3
Technical Elective (Environmental, choose from a list maintained by the department.)		3
Year Total:	15	18

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**Total Units in Sequence:** **132**

<sup>1</sup> This Social Science Elective should be selected from the following courses in order to meet State Minimum Core and the General Education Outcome 4.1: ANTH 10203, COMM 10203, GEOG 21003, GEOG 210H3, HDFS 14003, HDFS 24103, HDFS 26003, HIST 11193, HIST 111H3, HIST 11293, HIST 112H3, HIST 20903, HUMN 111H4, HUMN 211H4, PLSC 20103, or RESM 28503.

<sup>2</sup> The Humanities Elective should be selected from the following courses in order to meet State Minimum Core and the General Education Outcomes 3.2 and 5.1: CLST 10003, CLST 10103, PHIL 20003, PHIL 200H3, or PHIL 21003.

<sup>3</sup> The Fine Arts Elective should be selected from the following courses in order to meet the State Minimum Core and the General Education Outcome 3.1: ARHS 10003, COMM 10003, DANC 10003, MUSC 10003, MUSC 100H3, MUSC 10103, MUSC 101H3, MUSC 13303, THTR 10003, or THTR 10103.