

# Biological Engineering (BS) (11BEBS)

## Freshman Year

Fall Semester	Credit	Spring Semester	Credit
CH 101 Chemistry, A Molecular Science <sup>1B</sup>	3	CH*** Chemistry Elective <sup>2</sup>	4
CH 102 General Chemistry Lab <sup>1B</sup>	1	MA 241 Calculus II <sup>1A</sup>	4
E 101 Introduction to Engr & Prob Solv <sup>1</sup>	1	PY 205 Physics for Engineers & Scientists I <sup>1B</sup>	3
E 115 Intro to Computing Environ	1	PY 206 Physics for Engineers & Scientists I Lab <sup>1B</sup>	1
ENG 101 Academic Writing & Research <sup>1H</sup>	4	Economics (GEP Soc Sci Req <sup>D</sup> ) <sup>3</sup>	3
MA 141 Calculus I <sup>1A</sup>	4		
HES_*** Health & Exercise Studies Course <sup>E</sup>	1		
	15		15

## Sophomore Year

Fall Semester	Credit	Spring Semester	Credit
BAE 200 Comp Meth in Biol Engr	2	BAE 202 Intro to BAE Methods <b>or</b> BAE 203 Intro to ACAD <b>and</b> BAE 204 Intro to Env & Eco Eng	4 ( <b>or</b> 2 and 2)
MAE 206 Engineering Statis <b>or</b> CE 214 Engineering Mechanics-Statics <sup>1</sup>	3	MAE 208 Engineering Dynamics	3
MA 242 Calculus III	4	MA 341 Applied Diff Equations	3
PY 208 Physics for Engineers & Scientists II <sup>B</sup>	4	MAE 201 Engr Thermodynamics I	3
PY 209 Physics for Engineers & Scientists II Lab		Biol Science/Chemistry Elective <sup>4</sup>	3
BIO 181 Intro Biol: Ecol, Evol & Biodiv <sup>B</sup> <b>or</b> BIO 183 Intro Biol: Cell & Mol Biol <sup>B</sup>	4		
	17		16

## Junior Year

Fall Semester	Credit	Spring Semester	Credit
BAE 302 Transport Phenomena	3	BAE*** BAE Elective <sup>5</sup>	3
BAE*** BAE Elective <sup>5</sup>	3	MAE 214 Solid Mechanics <b>or</b> CE 313 Mechanics of Solids <sup>1</sup>	3
MAE 308 Fluid Mechanics <b>or</b> CE 382 Hydraulics <sup>1</sup>	3	ST 370 Prob & Statistics for Engr	3
ENG 331 Comm Engr & Tech <b>or</b> ENG 333 Comm Sci & Res	3	BAE 401 Instrumentation for Bio Sys	3
BAE 305 Bio Eng Circuits	4	Adv. Biology Elective	3
	16		15

## Senior Year

Fall Semester	Credit	Spring Semester	Credit
BAE 451 Engr Design I	2	BAE 452 Engr Design II	2
Engr Elective <sup>7</sup>	3	Advanced Bio Eng Elective <sup>9</sup>	3
Engr Elective <sup>7</sup>	3	GEP Social Science Elective <sup>D</sup>	3
BAE *** BAE Elective <sup>5</sup>	3	GEP Interdisciplinary Persp. Elec. <sup>G</sup>	2
Ethics (GEP Interdisciplinary Persp. Elec. <sup>G</sup> ) <sup>8</sup>	3	GEP Additional Breadth Requirement <sup>F</sup>	3
GEP Humanities Requirement <sup>C</sup>	3	GEP Humanities Requirement <sup>C</sup>	3
		HES_*** Phys Ed/Healthy Living Elective <sup>E</sup>	1
	17		17

Minimum Credit Hours Required for Graduation\*:

128

## Major/Program requirements and footnotes

**1** Must be completed with a grade of C- or higher.

**2** Choose from CH 201& 202; CH 220 & 222; or CH 221 & 222.

**3** Choose from EC 205, ARE 201 or EC 201.

**4** Choose from SSC 200, CH 201& 202, CH 220 & 222; CH 221 & 222, PB/BIO 360, or any advanced biology elective.

**5** Choose from BAE 361, 322, 371 or 481.

**6** Choose from GN 311, HS 462, MB 351, PB 321, PB/BIO 360, BIO 361, BIO 414 or SSC 332.

**7** Choose from BAE 361, 322, 371, 425, 462, 471, 472, 473, 474, 481, 528 or 578; or CHE 435; or ISE 311.

**8** Choose from IDS 201, STS 302 or STS 304.

**9** Choose from BAE 425, 474, or 488.

## \*General Education Program (GEP) requirements

To complete the requirements for graduation and the General Education Program, the following credit hours and co-requisites must be satisfied. University approved GEP course lists for each category can be found at <https://oucc.dasa.ncsu.edu/general-education-program/>.

**A. Mathematical Sciences** (6 credit hours – one course with MA or ST prefix)

*Choose from the University approved GEP Mathematical Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: MA 141, MA 241*

**B. Natural Sciences** (7 credit hours – include one laboratory course or course with a lab)

*Choose from the University approved GEP Natural Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: CH 101, CH 102, BIO 181, BIO 183, PY 205, PY 208*

**C. Humanities** (6 credit hours selected from two different disciplines/course prefixes)

*Choose from the University approved GEP Humanities course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: None*

**D. Social Sciences** (6 credit hours selected from two different disciplines/course prefixes)

*Choose from the University approved GEP Social Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: EC 201, 205, or ARE 201*

**E. Health & Exercise Studies** (2 credit hours – at least one 100-level Health & Exercise Studies Course)

*Choose from the University approved GEP Health & Exercise Studies course list.*

**F. Additional Breadth** (3 credit hours to be selected from the following checked University approved GEP course lists)

Humanities/Social Sciences/Visual and Performing Arts or  Mathematical Sciences/Natural Sciences/Engineering

**G. Interdisciplinary Perspectives** (5-6 credit hours)

*Choose from the University approved GEP Interdisciplinary Perspectives course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: None*

**H. Introduction to Writing** (4 credit hours satisfied by completing ENG 101 with a C- or better)

The following **Co-Requisites** must be satisfied to complete the General Education Program requirements

**I. U.S. Diversity (USD)**

*Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite. The following course(s) completed as part of the Major requirements may fulfill this requirement: None*

**J. Global Knowledge (GK)**

*Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite. The following course(s) completed as part of the Major requirements may fulfill this requirement: None*

**K. Foreign Language proficiency**

Proficiency at the FL\_102 level is required for graduation.