

# BIOLOGICAL AND AGRICULTURAL ENGINEERING - BS, BIOLOGICAL ENGINEERING TRACK

This program equips graduates with a broad engineering background to innovate in food, fiber, biological systems and processes, meeting essential societal needs in multiple industries.

Biological engineers apply their knowledge of physical and biological sciences, mathematics, engineering principles and engineering design to the production and processing of food and fiber and biological systems and processes. Because of their broad general engineering background, biological engineering graduates are sought by a wide variety of employers including crop storage and handling industries, food and feed processing industries, animal production industries, biotechnology companies, chemical companies, and governmental agencies. Biological engineers make significant contributions to meeting many basic needs of society such as maintaining food quality, quantity and safety; manufacturing new products from biological materials and developing engineering sustainable and more efficient technologies to feed the world.

## Program Requirements

### First Year

Fall		Semester Credit Hours
CHEM 107	General Chemistry for Engineering Students <sup>1</sup>	3
CHEM 117	General Chemistry for Engineering Students Laboratory <sup>1</sup>	1
ENGL 104	Composition and Rhetoric <sup>1</sup>	3
ENGR 102	Engineering Lab I - Computation <sup>1</sup>	2
MATH 151	Engineering Mathematics I <sup>1,2</sup>	4
American history ( <a href="https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history">https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history</a> ) <sup>3</sup>		3
<b>Semester Credit Hours</b>		<b>16</b>
Spring		
ENGL 210	Technical and Professional Writing	3
ENGR 216/ PHYS 216	Experimental Physics and Engineering Lab II - Mechanics <sup>1</sup>	2
PHYS 206	Newtonian Mechanics for Engineering and Science <sup>1</sup>	3
MATH 152	Engineering Mathematics II <sup>1</sup>	4
POLS 206	American National Government	3
<b>Semester Credit Hours</b>		<b>15</b>

### Second Year

Fall		
BAEN 201	Analysis of Biological and Agricultural Engineering Problems <sup>1</sup>	3
BIOL 111	Introductory Biology I <sup>1</sup>	4

ENGR 217/ PHYS 217	Experimental Physics and Engineering Lab III - Electricity and Magnetism <sup>1</sup>	2
MATH 251	Engineering Mathematics III <sup>1</sup>	3
MEEN 221	Statics and Particle Dynamics <sup>1</sup>	3
PHYS 207	Electricity and Magnetism for Engineering and Science <sup>1</sup>	3

**Semester Credit Hours 18**

### Spring

BAEN 301	Biological and Agricultural Engineering Fundamentals I <sup>1</sup>	3
BAEN 320	Engineering Thermodynamics <sup>1</sup>	3
CHEM 222	Elements of Organic and Biological Chemistry <sup>1</sup>	3
MATH 308	Differential Equations <sup>1</sup>	3
MSEN 222/ MEEN 222	Materials Science <sup>1</sup>	3
Social and behavioral sciences ( <a href="https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#social-behavioral-sciences">https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#social-behavioral-sciences</a> ) <sup>3</sup>		3

**Semester Credit Hours 18**

### Third Year

#### Fall

BAEN 302	Biological and Agricultural Engineering Fundamentals II <sup>1</sup>	3
BAEN 340	Fluid Mechanics <sup>1</sup>	3
BAEN 354	Engineering Properties of Biological Materials <sup>1</sup>	3
ECEN 215	Principles of Electrical Engineering <sup>1</sup>	3
Language, philosophy and culture ( <a href="https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture">https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture</a> ) <sup>3</sup>		3

**Semester Credit Hours 15**

#### Spring

BAEN 365	Unit Operations for Biological and Agricultural Engineering <sup>1</sup>	3
BAEN 366	Transport Processes in Biological Systems <sup>1</sup>	3
BAEN 370	Measurement and Control of Biological Systems and Agricultural Processes <sup>1</sup>	3
POLS 207	State and Local Government	3
Mathematics elective <sup>1,4</sup>		3

**Semester Credit Hours 15**

### Fourth Year

#### Fall

BAEN 399	Professional Development <sup>5</sup>	0
BAEN 401	Bioprocess Systems Design <sup>1</sup>	3
BAEN 422/ CHEN 422	Unit Operations in Food Processing <sup>1</sup>	3
BAEN 479	Biological and Agricultural Engineering Design I <sup>1,6</sup>	3
Biological and agricultural engineering elective <sup>1,7</sup>		3
Engineering elective <sup>1,8</sup>		3

**Semester Credit Hours 15**

**Spring**

BAEN 480	Biological and Agricultural Engineering Design II <sup>1,6</sup>	3
American history ( <a href="https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history">https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history</a> ) <sup>3</sup>		3
Creative arts ( <a href="https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts">https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts</a> ) <sup>3</sup>		3
Biological and agricultural engineering elective <sup>1,7</sup>		3
Technical elective <sup>1,9</sup>		3
<b>Semester Credit Hours</b>		<b>15</b>
<b>Total Semester Credit Hours</b>		<b>127</b>

<sup>1</sup> Must make a grade of C or better.

<sup>2</sup> Entering students will normally be given a placement test in mathematics. Test results will be used in selecting the appropriate starting course which may be at a higher or lower level.

<sup>3</sup> The three hours of international and cultural diversity (<https://catalog.tamu.edu/undergraduate/general-information/degree-information/international-cultural-diversity-requirements/>) and three hours of cultural discourse (<https://catalog.tamu.edu/undergraduate/general-information/degree-information/cultural-discourse-requirements/>) courses, as required for graduation, may be met by courses that also satisfy a core curriculum course.

<sup>4</sup> Select from CHEN 320; CVEN 302; MATH 304, MATH 417; MEEN 357; STAT 211.

<sup>5</sup> All engineering students are required to complete a high-impact experience in order to graduate. The list of possible high-impact experiences is available in the BAEN advising office.

<sup>6</sup> All undergraduate students must take at least two (2) specific courses in their major designated as writing intensive.

<sup>7</sup> Select from BAEN 400-478 (<https://catalog.tamu.edu/undergraduate/course-descriptions/baen/>), BAEN 485, BAEN 489.

<sup>8</sup> Select from BAEN 400- 478 (<https://catalog.tamu.edu/undergraduate/course-descriptions/baen/>), BAEN 485, BAEN 489; CHEN 451, CHEN 455/SENG 455, CHEN 460/SENG 460; CVEN 301/EVEN 301, CVEN 303, CVEN 336, CVEN 339/EVEN 339, CVEN 402/EVEN 402, CVEN 450, CVEN 455, CVEN 458/EVEN 458, CVEN 462/EVEN 462; MEEN 363, MEEN 364, MEEN 441, MEEN 442, MEEN 444, MEEN 460; MTDE 333; SENG 310, SENG 312, SENG 321; Other courses may be approved by request to the advising office.

<sup>9</sup> Select from AGSM 473, ANSC 307, ANSC 320, ANSC 326/FSTC 326, ANSC 327/FSTC 327; BESC 320, BESC 357, BESC 367, BESC 401, BESC 402, BESC 403; BIOL 349, BIOL 351; ECCB 351, ECCB 407, ECCB 444; FSTC 305, FSTC 312, FSTC 313, FSTC 457/ANSC 457, FSTC 470/ANSC 470, FSTC 487/ANSC 487 ; GEOG 390; GEOL 410; MMET 307; NUTR 410/FSTC 410; POSC 309, POSC 326, POSC 406, POSC 427; SCSC 301, SCSC 311, SCSC 405. Other courses may be approved by request to the advising office.