

**Departmental/Program Major Courses (59 credits)**

**Required Major courses (39 credits)**

- \_\_\_\_\_ (4) ABE 20100 Thermodynamics in Biological Systems I
- \_\_\_\_\_ (3) ABE 20200 Thermodynamics in Biological Systems II
- \_\_\_\_\_ (1) ABE 29000 Sophomore Seminar [\*\(satisfies UCC Science, Technology & Society requirement\)\*](#)
- \_\_\_\_\_ (3) ABE 30100 Numerical and Computational Modeling in Biological Engineering
- \_\_\_\_\_ (3) ABE 30300 Applications of Physical Chemistry to Biological Processing
- \_\_\_\_\_ (3) ABE 30400 Bioprocess Engineering Laboratory
- \_\_\_\_\_ (3) ABE 30700 Momentum Transfer in Food and Biological Systems
- \_\_\_\_\_ (3) ABE 30800 Heat and Mass Transfer in Food and Biological Systems
- \_\_\_\_\_ (3) ABE 37000 Biological/Microbial Kinetics and Reaction Engineering
- \_\_\_\_\_ (3) ABE 45700 Transport Operations in Food and Biological Engineering I
- \_\_\_\_\_ (3) ABE 46000 Sensors and Process Control
- \_\_\_\_\_ (1) ABE 49000 Professional Practice in Agricultural and Biological Engineering
- \_\_\_\_\_ (3) ABE 55700 Transport Operations in Food and Biological Systems
- \_\_\_\_\_ (3) ABE 55800 Process Design for Food and Biological Systems (Capstone) [\*\(satisfies COA Capstone or Experience Selective\)\*](#)

**Cellular and Biomolecular Engineering Major Concentration Courses (20 credits)**

- \_\_\_\_\_ (2) ABE 22600 Biotechnology Laboratory I [\*\(satisfies a COA Biological Science selective\)\*](#)
- \_\_\_\_\_ (2) ABE 22700 Biotechnology Laboratory II [\*\(satisfies a COA Biological Science selective\)\*](#)
- \_\_\_\_\_ (3) ABE 44000 Cell and Molecular Design Principles [\*\(satisfies a COA Biological Science selective\)\*](#)
- \_\_\_\_\_ (3) ABE 58000 Process Engineering of Renewable Resources
- \_\_\_\_\_ (3) BIOL 23000 Biology of the Living Cell [\*\(satisfies a COA Biological Science selective\)\*](#)
- \_\_\_\_\_ (4) [\*Cellular & Biomolecular Engineering Concentration Biological Science Selective\*](#)
- \_\_\_\_\_ (3) [\*Cellular & Biomolecular Engineering Concentration Biological Science Selective OR Science Selective\*](#)

**Other Department/Program Course Requirements (69-70 credits)**

- \_\_\_\_\_ (3) CHE 32000 Statistical Modeling and Quality Enhancement
- \_\_\_\_\_ (4) CHM 11500 General Chemistry I [\*\(satisfies a UCC Science requirement\)\*](#)
- \_\_\_\_\_ (4) CHM 11600 General Chemistry II [\*\(Recommended FYE selective\) \(satisfies a UCC Science requirement\)\*](#)
- \_\_\_\_\_ (4) CHM 25700 Organic Chemistry (or (3) CHM 25500 Organic Chem + (1) CHM 25501 Organic Chem I Lab)
- \_\_\_\_\_ (3) CS 15900 C Programming or
  - \_\_\_\_\_ (4) CS 177 Programming with Multiple Options
- \_\_\_\_\_ (2) ENGR 13100 Transforming Ideas to Innovation I [\*\(satisfies UCC Information Literacy requirement\)\*](#)
- \_\_\_\_\_ (2) ENGR 13200 Transforming Ideas to Innovation II
- \_\_\_\_\_ (4) MA 16500 Analytic Geometry & Calculus I (or (5) MA 16100) [\*\(satisfies UCC Quantitative Reasoning requirement\)\*](#)
- \_\_\_\_\_ (4) MA 16600 Analytic Geometry & Calculus II (or (5) MA 16200)
- \_\_\_\_\_ (4) MA 26100 Multivariate Calculus
- \_\_\_\_\_ (4) MA 26200 Linear Algebra and Differential Equations
- \_\_\_\_\_ (3) MA 30300 Differential Equations and Partial Differential Equations for Engineering and the Sciences
- \_\_\_\_\_ (4) PHYS 17200 Modern Mechanics
- \_\_\_\_\_ (3) [\*Economics Selective \(satisfies UCC Human Cultures: Behavioral/Social Sci requirement & COA Economics selective\)\*](#)
- \_\_\_\_\_ (3) [\*Human Cultures: Humanities Selective \(satisfies UCC Human Cultures: Humanities requirement\)\*](#)
- \_\_\_\_\_ (6) [\*Humanities or Social Science Selective\*](#)
- \_\_\_\_\_ (3) [\*Humanities or Social Science Selective\*](#) (30000+ level)
- \_\_\_\_\_ (3) [\*Oral Communication Selective \(satisfies UCC Oral Communication requirement\)\*](#)
- \_\_\_\_\_ (3-4) [\*Written Communication Selective \(Written Communication requirement\)\*](#)
- \_\_\_\_\_ (3) [\*Written or Oral Communication Selective\*](#) (20000+ level)
- \_\_\_\_\_ [\*International Understanding\*](#) (6 credits - may be met with UCC or COA Core Requirements)
- \_\_\_\_\_ [\*Multicultural Awareness\*](#) (3 credits - may be met with UCC or COA Core Requirement)

**Electives (0-1credits)**

- \_\_\_\_\_ (0-1) \_\_\_\_\_

129 semester credits required for degree completion. 2.0 Graduation GPA required for Bachelor of Science degree. The student is ultimately responsible for knowing and completing all degree requirements. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.

Suggested Arrangement of Courses

Note that course placement is dependent upon both pre-requisite requirements as well as limited offering terms

**(ABE courses ONLY offered in Fall or Spring terms – not both)**

Please see your academic advisor for other options creating your personalized plan of study

PRE-ABE/FYE Curriculum – must earn C- or higher in all Pre-ABE/FYE courses to transition to major					
Credits	Fall 1st Year	Prerequisite	Credits	Spring 1st Year	Prerequisite
4	<b>CHM 11500*</b>	pre/co: MA 16100/16500	4	<b>CHM 11600*§</b>	CHM 11500
2	<b>ENGR 13100*</b>		2	<b>ENGR 13200</b>	ENGR 13100
4-5	<b>MA 16500* or MA 16100</b>	min. ALEKS score=85	4-5	<b>MA 16600 or MA 16200</b>	MA 16100/16500 (≥ C-)
3	<a href="#">Human Cultures: Humanities Selective</a>		4	<b>PHYS 17200*</b>	pre/co: MA 16100/16500
3	<a href="#">Written Communication Selective*</a>		3	<a href="#">Oral Communication Selective*</a>	
<b>16-18</b>			<b>17-18</b>		

Credits	Fall 2nd Year	Prerequisite	Credits	Spring 2nd Year	Prerequisite
4	<b>ABE 20100†</b>	CHM 11600	3	<b>ABE 20200†</b>	ABE 20100, MA 26100 (≥ C-)
2	<b>ABE 22600</b>		2	<b>ABE 22700</b>	ABE 22600
1	<b>ABE 29000†</b>		3	<b>CHE 32000‡</b>	ABE 20100, CHM 25700, CHM 25500/25501 pre/co: MA 26100 (≥ C-)
3	<b>BIOL 23000</b>	CHM 11600, MA 16200/MA 16600, (≥ C-) MA 26100 (≥ C-)	3-4	<b>CS 15900 or CS 17700</b>	
4	<b>MA 26100</b>	MA 16200/16600 (≥ C-)	4	<b>MA 26200</b>	MA 26100 (≥ C-)
4	<b>CHM 25700 or CHM 25500+25501</b>	CHM 11600			
<b>18</b>			<b>15-16</b>		

Credits	Fall 3rd Year	Prerequisite	Credits	Spring 3rd Year	Prerequisite
3	<b>ABE 30300†</b>	ABE 20200, CHM 25700 pre/co: ABE 30700	3	<b>ABE 30100‡</b>	ABE 37000, CS 15900 or CS 17700 MA 30300
3	<b>ABE 30700†</b>	ABE 20200, pre/co: MA 30300	3	<b>ABE 30400‡</b>	co: ABE 30800
3	<b>ABE 37000†</b>	CHM 25700, MA 26200, (≥ C-) BIOL 22100 or 23000 or 23100	3	<b>ABE 30800‡</b>	ABE 30700
3	<b>MA 30300</b>	MA 26200 (≥ C-)	3	<b>ABE 45700‡</b>	co: ABE 30800
4	<a href="#">CBOE: Biological Science Selective</a>		3	<a href="#">Economics Selective</a>	
<b>16</b>			<b>15</b>		

Credits	Fall 4th Year	Prerequisite	Credits	Spring 4th Year	Prerequisite
3	<b>ABE 46000‡</b>	MA 26200 (≥ C-)	3	<b>ABE 44000</b>	MA 26200, (≥ C-) MA 30300, BIOL 23000
1	<b>ABE 49000†</b>	ABE 29000	3	<b>ABE 55800‡</b>	ABE 55700
3	<b>ABE 55700†</b>	ABE 45700	3	<b>ABE 58000</b>	ABE 37000 or CHE 34800
3	<a href="#">CBOE: Biological Science Selective or Science Selective</a>		3	<a href="#">Humanities or Social Science Selective</a>	
3	<a href="#">Humanities or Social Science Selective</a>		3	<a href="#">Humanities or Social Science Selective (30000+)</a>	
3	<a href="#">Written or Oral Communication Selective (20000+)</a>		0-1	Elective	
<b>16</b>			<b>15-16</b>		

\* Fulfills University Undergraduate Core Curriculum Requirement.

§ Fulfills FYE selective for Biological Engineering

† Indicates Fall only course

‡ Indicates Spring only course

[International Understanding \(6 credits\)](#) and [Multicultural Awareness \(3 credits\)](#) may be met with UCC or COA Core Requirements. 129 semester credits required for degree completion. 2.0 Graduation GPA required for Bachelor of Science degree. The student is ultimately responsible for knowing and completing all degree requirements. The myPurduePlan powered by DegreeWorks is the knowledge source for specific requirements and completion.