****[**Biological Engineering, BSBE**](https://engineering.purdue.edu/ABE/academics/undergraduate/be.html)

**Fall 2022**

**Program:** BE-BSE

**Major:** BIEN

**Credit Hours:** 141

**Pre-Med Track**

**[Department of Agricultural and Biological Engineering](https://www.admissions.purdue.edu/majors/a-to-z/biological-engineering-multiple-concentrations.php)**

**Departmental/Program Major Courses (61 credits)**

**Required Major courses (45 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)***](https://www.purdue.edu/provost/students/s-initiatives/curriculum/courses.html)

\_\_\_\_\_ (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 31400 Design of Electronic System

\_\_\_\_\_ (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

\_\_\_\_\_ (3) ABE 58000 Processing Engineering of Renewable Resources

**Biological Engineering Major Selectives (16 credits)**

\_\_\_\_\_ (7) [Biology](https://catalog.purdue.edu/preview_program.php?catoid=15&poid=23638) Selective (two or more courses)

\_\_\_\_\_ (9) [Biology or Science Selective](https://catalog.purdue.edu/preview_program.php?catoid=15&poid=23674) (three or more courses)

**Other Department/Program Course Requirements (79-80 credits)**

\_\_\_\_\_ (2) ENGR 13100 Transforming Ideas to Innovation I [***(satisfies UCC Information Literacy requirement)***](https://www.purdue.edu/provost/students/s-initiatives/curriculum/courses.html)

\_\_\_\_\_ (2) ENGR 13200 Transforming Ideas to Innovation II

\_\_\_\_\_ (3) CHE 32000 Statistical Modeling and Quality Enhancement

\_\_\_\_\_ (4) CHM 11500 General Chemistry I[***(satisfies a UCC Science requirement)***](https://www.purdue.edu/provost/students/s-initiatives/curriculum/courses.html)

\_\_\_\_\_ (4) CHM 11600 General Chemistry II [***(satisfies a UCC Science requirement)***](https://www.purdue.edu/provost/students/s-initiatives/curriculum/courses.html)

\_\_\_\_\_ (4) CHM 25700 Organic Chemistry *(or (3) CHM 25500 Organic Chem + (1) CHM 25501 Organic Chem I Lab)*

\_\_\_\_\_ (4) CHM 25600 *(3)* + CHM 25601 *(1)*

\_\_\_\_\_ (3) CS 15900 C Programming (Pre-ABE may use (4) CS 177 Programming with Multiple Options)

\_\_\_\_\_ (4) MA 16500 Analytic Geometry & Calculus I (or (5) MA 16100)[**(satisfies UCC *Quantitative Reasoning requirement)***](https://www.purdue.edu/provost/students/s-initiatives/curriculum/courses.html)

\_\_\_\_\_ (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) PHYS 24100 Electricity and Optics

\_\_\_\_\_ (3) BCHM 30700 Biochemistry

\_\_\_\_\_ (3) [Economics Selective](https://catalog.purdue.edu/preview_program.php?catoid=15&poid=23638)[***(satisfies UCC Human Cultures: Behavioral/Social Sciences requirement)***](https://www.purdue.edu/provost/students/s-initiatives/curriculum/courses.html)

\_\_\_\_\_ (3) [Human Cultures: Humanities Selective](https://ag.purdue.edu/oap/Pages/core_social-humanities.aspx) [***(satisfies UCC Human Cultures: Humanities requirement)***](https://www.purdue.edu/provost/students/s-initiatives/curriculum/courses.html)

\_\_\_\_\_ (3) [Humanities or Social Science Selective](https://ag.purdue.edu/department/oap/corereqpages/humanities.html)

\_\_\_\_\_ (3) [Humanities or Social Science Selective](https://ag.purdue.edu/department/oap/corereqpages/humanities.html)

\_\_\_\_\_ (3) [Humanities or Social Science Selective](https://ag.purdue.edu/department/oap/corereqpages/humanities.html) (30000+ level)

\_\_\_\_\_ (3) [Oral Communication Selective](https://ag.purdue.edu/oap/Pages/core_written-oral.aspx) [***(satisfies UCC Oral Communication requirement)***](https://www.purdue.edu/provost/students/s-initiatives/curriculum/courses.html)

\_\_\_\_\_ (3-4) [Written Communication Selective](https://ag.purdue.edu/oap/Pages/core_written-oral.aspx) [***Written Communication requirement)***](https://www.purdue.edu/provost/students/s-initiatives/curriculum/courses.html)

\_\_\_\_\_ (3) [Written or Oral Communication Selective](https://ag.purdue.edu/department/oap/corereqpages/written-and-oral.html) (20000+ level)

\_\_\_\_\_ [International Understanding](https://ag.purdue.edu/department/oap/corereqpages/international-understanding.html) (6 credits - may be met with UCC or COA Core Requirements)

\_\_\_\_\_ [Multicultural Awareness](https://ag.purdue.edu/department/oap/corereqpages/muticultural-awareness.html) (3 credits - may be met with UCC or COA Core Requirement)

**Electives (0-1 credits)**

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

141 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 Degree Works is the knowledge source for specific requirements and completion.

****[**Biological Engineering, BSBE**](https://engineering.purdue.edu/ABE/academics/undergraduate/be.html)

**Fall 2022**

**Program:** BE-BSE

**Major:** BIEN

**Min. Credit Hours:** 141

**Pre-Med Track**

[**Department of Agricultural and Biological Engineering**](https://www.admissions.purdue.edu/majors/a-to-z/biological-engineering-multiple-concentrations.php)

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 Curriculum – must earn C- or higher in all Pre-ABE courses** | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Credits | **Fall 1st Year** | **Prerequisite** | | Credits | **Spring 1st Year** | | **Prerequisite** |
| 4 | **CHM 11500\*** | | pre/co: MA 16100/16500 | 4 | **CHM 11600\*** | CHM 11500 | |
| 2 | **ENGR 13100\*** | |  | 2 | **ENGR 13200** | ENGR 13100 | |
| 4-5 | **MA 16500\* or MA 16100** | | min. ALEKS score 85% | 3-4 | **CS 15900 or CS 17700** | CS 17700: PABE only | |
| 4 | **PHYS 17200\*** | | Co: MA 16100/MA16500 | 4-5 | **MA 16600 or MA 16200** MA 16100/16500 (≥ C-) | | |
| 3-4 | [**Written Communication Selective**](https://www.purdue.edu/provost/students/s-initiatives/curriculum/courses.html)**\* or**  [**Oral Communication Selective\***](https://www.purdue.edu/provost/students/s-initiatives/curriculum/courses.html) | | | 3-4 | [**Written Communication Selective**](https://www.purdue.edu/provost/students/s-initiatives/curriculum/courses.html)**\* or**  [**Oral Communication Selective\***](https://www.purdue.edu/provost/students/s-initiatives/curriculum/courses.html) | | |
| **17-19** |  | |  | **16-19** |  |  | |

| Credits | **Fall 2nd Year** | **Prerequisite** | Credits | **Spring 2nd Year** | **Prerequisite** |
| --- | --- | --- | --- | --- | --- |
| 4 | **ABE 20100†** | CHM 11600 | 3 | **ABE 20200‡** | ABE 20100, MA 26100 (≥ C-) |
| 1 | **ABE 29000†** |  | 3 | **CHE 32000‡** | ABE 20100, CHM 25700, pre/co: MA 26100 (≥ C-) |
| 4 | **MA 26100** | MA 16200/16600 (≥ C-) | 4 | **CHM 25600 & CHM 25601** |  |
| 4 | **CHM 25500 & CHM 25501** |  | 4 | **MA 26200** | MA 26100 (≥ C-) |
| 4 | [**Biology Selective**](https://catalog.purdue.edu/preview_program.php?catoid=15&poid=23674) | | 3 | [**Biology Selective**](https://catalog.purdue.edu/preview_program.php?catoid=15&poid=23674) |  |
| **17** |  |  | **17** |  |  |

| Credits | **Fall 3rd Year** | **Prerequisite** | Credits | **Spring 3rd Year** | **Prerequisite** | |
| --- | --- | --- | --- | --- | --- | --- |
| 3 | **ABE 30300†** | ABE 20200, CHM 25500/25501  pre/co: ABE 30700 | 3 | **ABE 30100‡** | | ABE 37000, CS 15900 or CS 17700, MA 30300 |
| 3 | **ABE 30700†** | ABE 20200, pre/co: MA 30300 | 3 | **ABE 30400‡** | | co: ABE 30800 |
| 3 | **ABE 37000†** | CHM 25500/25501, MA 26200, (≥ C-), BIOL 22100 or 23000 or 23100 | 3 | **ABE 30800‡** | | ABE 30700 |
| 3 | **MA 30300** | MA 26200 (≥ C-) | 3 | **ABE 31400‡** | |  |
| 3 | [**PHYS**](https://catalog.purdue.edu/preview_program.php?catoid=15&poid=23674) **24100** | | 3 | **ABE 45700‡** co: ABE 30800 | | |
| 3 | **BCHM 30700** |  | 3 | [**Human**](https://ag.purdue.edu/department/oap/corereqpages/humanities.html) **Cultures: Humanities Selective** | | |
| **18** |  |  | **18** |  | |  |

| Credits | **Fall 4th Year** | **Prerequisite** | Credits | **Spring 4th Year** | **Prerequisite** |
| --- | --- | --- | --- | --- | --- |
| 1 | **ABE 49000†** | ABE 29000 | 3 | **ABE 46000‡** | MA 26200 |
| 3 | **ABE 55700†** | ABE 45700 | 3 | **ABE 55800‡** | ABE 55700 |
| 3 | [**Biology**](https://ag.purdue.edu/department/oap/corereqpages/humanities.html) **or Science Selective** | | 3 | [**ABE**](https://catalog.purdue.edu/preview_program.php?catoid=15&poid=23638) **58000** | |
| 3 | [**Biology**](https://ag.purdue.edu/department/oap/corereqpages/humanities.html) **or Science Selective** | | 3 | [**Biology**](https://ag.purdue.edu/department/oap/corereqpages/humanities.html) **or Science Selective** | |
| 3 | [**Economics Selective**](https://catalog.purdue.edu/preview_program.php?catoid=15&poid=23638) | | 3 | [**Humanities or Social Science Selective (30000+)**](https://ag.purdue.edu/department/oap/corereqpages/humanities.html) | |
| 3 | [**Humanities or Social Science Selective**](https://ag.purdue.edu/department/oap/corereqpages/humanities.html) | | 3 | [**Humanities or Social Science Selective**](https://ag.purdue.edu/department/oap/corereqpages/humanities.html) | |
| 3 | [**Written or Oral Communication Selective (20000+)**](https://ag.purdue.edu/department/oap/corereqpages/written-and-oral.html) | | 0-1 | **Elective** | |
| **19** |  |  | **18-19** |  |  |

\* Fulfills University Undergraduate Core Curriculum Requirement.

† Indicates Fall only course or ‡ Indicates Spring only course

[**International Understanding**](https://ag.purdue.edu/oap/Pages/core_international.aspx) **(6 credits) and** [**Multicultural Awareness**](https://ag.purdue.edu/oap/Pages/core_multicultural.aspx) **(3 credits) may be met with UCC or COA Core Requirements).**

**Pre-Med Track Continued**

141 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 Degree Works is the knowledge source for specific requirements and completion.

Recommended electives: Additional Science coursework in Biomedical Ethics, Courses in Humanities and Social Sciences, specifically, PSY, PSY 12000, and SOC, SOC 10000 but also, HIST, ENGL, and/or PHIL, etc. Student who applies for medical school need two semesters of organic chemistry and should take CHM 25500/CHM 25501 and CHM 25600/CHM 25601, two semesters of general biology (BIOL 11000, or BIOL 13100/BIOL 23100/BIOL 23200 or BIOL 20300 and BIOL 20400) and PHYS 27200 or PHYS 24100.

**For more information go to the Pre-Professional Advising Office, Young Hall, Room 132-765-496-2690.**