# Bioresource Science and Engineering

## Suggested Course Sequencing

### Freshman Year

#### Autumn
- CHEM 142 General Chemistry I (5 cr)
- MATH 124 Calculus I (5 cr)
- GEN ST 199 or Elective (1-2 cr)

#### Winter
- CHEM 152 General Chemistry II (5 cr)
- MATH 125 Calculus II (5 cr)
- ENGL 131 Composition (5 cr)

#### Spring
- CHEM 162 General Chem. III (5 cr)
- MATH 126 Calculus III (5 cr)
- Any Course (2-5 cr)

### Sophomore Year

#### Autumn
- CHEM 237 Organic Chemistry I (4 cr)
- PHYS 121 Mechanics (5 cr)
- *MATH 307 Differential Equations (3 cr)
- BSE 210 Pulp, Paper and Bioproducts (4 cr)

#### Winter
- CHEM 238 Organic Chemistry II (4 cr)
- PHYS 122 Electromag-Oscill (5 cr)
- **MATH 308 Linear Algebra (3 cr)
- ENGR 231 Tech Writing (5 cr)

#### Spring
- BSE 210 Pulp, Paper and Bioproducts (4 cr)
- PHYS 123 Waves (5 cr)
- A A 260 Thermodyn (4 cr)
- [AA 260 must be taken before Aut of junior year (also offered Sum Qtr)]

### Junior Year

#### Autumn
- BSE 391 Eng Princip. Biorefineries (5 cr)
- BSE 406 Natural Products Chem (5 cr)
- Engineering Topics (3 cr)
- Q SCI 381 Statistics (5 cr)

#### Winter
- BSE 392* Bioresource Transport (5 cr)
- BSE 420* Bioresource Sci/Eng (5 cr)
- Engineering Topics (3 cr)
- ENGR 231 Tech Writing (5 cr)

#### Spring
- BSE 392* Bioresource Transport (5 cr)
- BSE 420* Bioresource Sci/Eng (5 cr)
- Engineering Topics (3 cr)

### Senior Year

#### Autumn
- BSE 422* Biore. Sci/Eng 3 (4 cr)
- BSE 430* Paper. Process+ (5 cr)
- BSE 497* Internship (1 cr)
- Any I&S credit (5 cr)

#### Winter
- BSE 436* Papermaking Lab II (4 cr)
- BSE 480* Bioresource Design (4 cr)
- Any I&S credit (5 cr)
- Any VLPA (5 cr)

#### Spring
- BSE 436* Papermaking Lab II (4 cr)
- BSE 480* Bioresource Design (4 cr)
- Any VLPA (5 cr)
- DIV credit (3 cr)
- Engineering Topics (3 cr)

### Engineering Topics
- (15 credits minimum):
  - Choose from the following list: CSE 142, 143, 160;
  - CHEM E 326, 341, 355, 375, 436, 455, 480, 481;
  - MSE 170, 310, 362, 463, 471, 475, 477;
  - CEE 220, 291, 354, 357, 480, 482, 487, 488, 490, 493, 494;
  - A A 210; E E 215; IND E 337; M E 123, 124, 230;
  - BSE 410; BSE 499 and/or ENGR 321 (max 6 credits)

### Business Option
- (12 credits minimum):
  - Choose from the following list: ESRM 400 (3, WIN), *ESRM 423 (3, WIN), ESRM 320 (5, SUM only online), ESRM 321 (5, SUM only online), ENTRE 443 (2, AUT), ACCTG 215 (5), ACCTG 219 (4), ACCTG 225 (5)

### Academic Progress Policy

All BSE students are expected to maintain satisfactory progress with the department and the University.


+All BSE courses require a 2.0 minimum grade.

*Offered all quarters

---

* Or AMATH 351 Diff Equations (3 cr)
** Or AMATH 352 Linear Algebra (3 cr)
1 Or STAT 390 or IND E 315

Effective Feb. 2021
Bioresource Science and Engineering Major Information

Accreditation

The BSE program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org. The Bioresource Science and Engineering Program is an engineering major based in the School of Environmental and Forest Sciences in the College of the Environment.

Program Focus

The BSE program focuses on the development of process engineers who optimize the manufacture of value added products from sustainable natural resources. Students learn the fundamentals of science and engineering related to the conversion of biomass to fuels, chemicals, and pulp and paper products. The BSE program has a strong research component.

BSE graduates begin careers in manufacturing, engineering, technical service and management training. Positions include process engineer, technical sales engineer, product development engineer, environmental engineer or scientist and research engineer as well as many other specialties that require a fundamental chemical engineering background.

Sample Areas of Research

- High-speed chemical analysis of biomass
- Use of natural non-wood products to make paper and other bio-products
- Bioconversion of lignocellulosic biomass to ethanol
- Biofuel and bioenergy options from wood
- Surface and colloid science in bioprocessing
- Fiber composites
- Sensor development for biorefineries
- Fiber production from agriculture residues
- Bioconversion of biomass to fuels and chemicals
- Life cycle assessment of biofuel systems
- Thermal conversion of biomass to fuels and chemicals
- Supercritical processes in biorefineries
- Production of unique nano-carbon structures from biomass

Additional Areas of Study: Students with an interest in chemical engineering may apply for admission to CHEM E during their BSE sophomore year. Contact the CHEM E department for advising in advance of application and notify the BSE advisers of the intent to pursue a double degree.

Admission:

- BSE is a capacity-constrained major.
- Applications for incoming freshmen are due November 15th. Current UW and transfer students apply through the College of Engineering online application.

Prospective UW students: www.washington.edu/admissions

Program/study options:

Research, internships, honors, scholarships, and graduate study for qualified applicants.

Career/job information:

BSE students are supported by the Washington Pulp and Paper Foundation (depts.washington.edu/wppf) for scholarships, internships and a path to full time employment.