



BACHELOR OF SCIENCE WITH A MAJOR IN:

# BIORESOURCE SCIENCE AND ENGINEERING

School of Environmental and Forest Sciences

UNIVERSITY of WASHINGTON  
College of the Environment

## SUGGESTED COURSE SEQUENCING

Freshman Year

### AUTUMN

CHEM 142 General Chemistry I<sup>(5 cr)</sup>  
MATH 124 Calculus I<sup>(5 cr)</sup>  
GEN ST 199 or Elective<sup>(1-2 cr)</sup>  
BSE 150 Intro to Bioresources<sup>(1 cr)</sup>

### WINTER

CHEM 152 General Chemistry II<sup>(5 cr)</sup>  
MATH 125 Calculus II<sup>(5 cr)</sup>  
BSE 201 Pulp, Paper and Bioproducts<sup>(3 cr)</sup>  
BSE 202 Pulp & Paper Field<sup>(1 cr)</sup>

### SPRING

CHEM 162 General Chem. III<sup>(5 cr)</sup>  
MATH 126 Calculus III<sup>(5 cr)</sup>  
ENGL 131 Composition<sup>(5 cr)</sup>

Sophomore Year

### AUTUMN

CHEM 237 Organic Chemistry I<sup>(4 cr)</sup>  
PHYS 121 Mechanics<sup>(5 cr)</sup>  
MATH 307 Differential Equations<sup>(3 cr)</sup>  
BSE 248<sup>+</sup> Paper Structure/Prop<sup>(4 cr)</sup>

### WINTER

CHEM 238 Organic Chemistry II<sup>(4 cr)</sup>  
PHYS 122 Electromag-Oscill<sup>(5 cr)</sup>  
MATH 308 Linear Algebra<sup>(3 cr)</sup>  
HCDE 231 Tech Writing<sup>(3 cr)</sup>

### SPRING

Q SCI 381 Statistics<sup>1(5 cr)</sup>  
PHYS 123 Waves<sup>(5 cr)</sup>  
CHEM E 310 Material/Energy Balance<sup>(4 cr)</sup>

Junior Year

### AUTUMN

BSE 406<sup>+</sup> Natural Products Chem<sup>(5 cr)</sup>  
CHEM E 325 Thermodyn<sup>(4 cr)</sup>  
CHEM 455\* or Engineering Topics<sup>(4 cr)</sup>  
CHEM E 330 Transport Processes<sup>(5 cr)</sup>

### WINTER

BSE 420<sup>+</sup> Bioresource Sci/Eng I<sup>(4 cr)</sup>  
CHEM E 340 Transport II<sup>(4 cr)</sup>  
CHEM E 326\* or Engineering Topics<sup>(4 cr)</sup>  
ECON 200 Microeconomics<sup>(5 cr)</sup>

### SPRING

BSE 426<sup>+</sup> Bioresource Lab<sup>(4 cr)</sup>  
BSE 421<sup>+</sup> Biores. Sci/Eng 2<sup>(4 cr)</sup>  
CHEM E 436\* or Engineering Topics<sup>(4 cr)</sup>

Senior Year

### AUTUMN

BSE 422<sup>+</sup> Biores. Sci/Eng 3<sup>(4 cr)</sup>  
BSE 430<sup>+</sup> Paper. Process+<sup>(5 cr)</sup>  
BSE 497<sup>+</sup> Internship<sup>(1 cr)</sup>  
Any I&S credit<sup>(5 cr)</sup>

### WINTER

BSE 436<sup>+</sup> Papermaking Lab II<sup>(4 cr)</sup>  
BSE 480<sup>+</sup> Bioresource Design<sup>(4 cr)</sup>  
Any I&S credit<sup>(5 cr)</sup>  
Any VLPA<sup>(5 cr)</sup>

### SPRING

BSE 481<sup>+</sup> Biores. Design II<sup>(5 cr)</sup>  
Any VLPA<sup>(5 cr)</sup>  
General Elective or NW<sup>(3-4 cr)</sup>

~ 180 credits required for degree ~

### ENGINEERING TOPICS & BUSINESS OPTION ELECTIVES

(12 credits minimum):

**Engineering Topics (min 8 crs):** BSE 488; CSE 142\*; CHEM E 220\*, 326\*, 341, 342, 345, 355, 436\*, 455, 462, 480, 481; MSE 170, 310, 362, 463, 471, 475; CEE 220, 350, 461, 480, 482, 485, 486, 487, 488, 490, 493, 494;

A A 210; E E 215; ESRM 325; IND E 337; M E 230

\* Recommended for CHEM E double degree applicants

**Business Option (must be declared, will appear on transcript, additional credits required):** ESRM 320 (5) (required), ESRM 321 (5) (required); Choose one: I BUS 300 (5), MKTG 301 (4), MKTG 335 (4), MKTG 450 (4), ESRM 400 (3), MGMT 300 (4), MGMT 401 (4), MGMT 403 (4), ACCTG 215 (5), ACCTG 225 (5), CFR 519 (5), OPMGT 301 (4).

Contact Chemical Engineering advising if you plan to apply for admission for a double degree:

advising@cheme.washington.edu

Recommended courses to meet Engineering Topics and General Electives:

CHEM 455—Aut CHEM E 326—Win CHEM E 436—Spr

### ADDITIONAL COLLEGE OF THE ENVIRONMENT REQUIREMENTS :

1. 10 cr I&S outside of BSE and major
2. 10 cr NW outside of BSE and major

General Electives may be used to fulfill these requirements. Remaining requirements are met within the major.

### Academic Progress Policy

Effective Autumn 2011

All BSE students are expected to maintain satisfactory progress with the department and the University.  
<http://www.cfr.washington.edu/academicPrograms/undergrad/bse/BSEAcademicProgressPolicy6-2010.pdf>

Notes: +Requires 2.0 minimum grade. \*STAT 390\* or IND E 315\* \*recommended for prospective CHEM E applicants

# BIORESOURCE SCIENCE AND ENGINEERING MAJOR INFORMATION

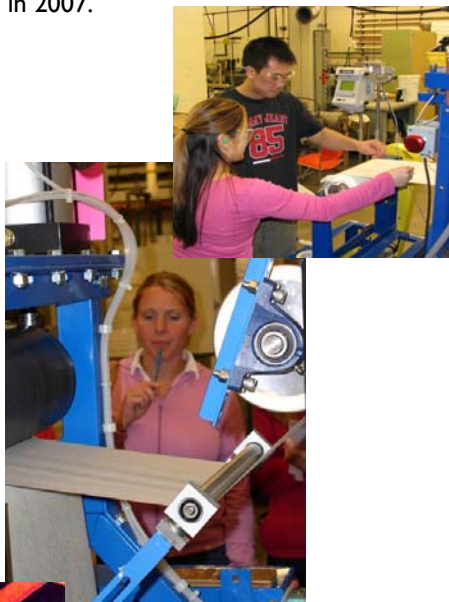
## Accreditation:

The Bioresource Science and Engineering Program is a rigorous ABET-accredited engineering major based in the School of Forest Resources in the College of the Environment. Accreditation was renewed in 2007.

## Program Focus

The BSE program focuses on the production of fuel, chemicals, and fiber products from biomass. Students learn the fundamental science and engineering of biomass and conversion processes. The BSE program also has a strong research focus.

BSE graduates find jobs in areas such as engineering, production, research, management, and marketing. Positions include process engineer, product development engineer, sales engineer, research scientist, computer and environmental scientist or engineer, production supervisor, and many specialists.



**Additional Areas of Study:** Students with an interest in chemical engineering may apply for admission to CHEM E during their BSE junior 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 competitive admission major. Applications will be considered year-round through either the SFR website or through the College of Engineering online application.

## Prospective UW students

[www.admit.washington.edu](http://www.admit.washington.edu)

## Program/study options

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

## Career/job information (sign up for job list below, uw students only)

[www.cfr.washington.edu/academicPrograms/advising/careerResources.shtml](http://www.cfr.washington.edu/academicPrograms/advising/careerResources.shtml)

Washington Pulp and Paper Foundation:  
[depts.washington.edu/wppf/](http://depts.washington.edu/wppf/)

College of Engineering Career Fair and Co-ops

## 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

## School of Environmental and Forest Sciences

UNIVERSITY of WASHINGTON

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Office of Student and Academic Services

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WEB: [sefs.washington.edu](http://sefs.washington.edu)