## Bioproducts and Biosystems Engineering - Bioproducts Engineering

### Freshman Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 1371 Calculus I (placement into course or pre-req)</td>
<td>Math 1372 Calculus II (1371)</td>
</tr>
<tr>
<td>Phys 1301W Intro Physics I (Chem 1301, &amp;Math 1371)</td>
<td>Phys 1302W Intro Physics II (1301, &amp;Math 1372)</td>
</tr>
<tr>
<td>Chem 1061 Chem Princ I (placement into course or 1015, &amp;1065)</td>
<td>Chem 1062 Chem Princ II (1061/1065, &amp;1066)</td>
</tr>
<tr>
<td>BBE 1001 BBE Orientation</td>
<td>BBE 1002 Biorenewable Resources</td>
</tr>
<tr>
<td>CSE 1001 1st Yr Experience</td>
<td>Liberal Education course or Writ 1301</td>
</tr>
</tbody>
</table>

| Liberal Education course or Writ 1301 | 3/4 |

### Sophomore Year

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 2374 Multivariable Calc (1372)</td>
<td>Math 2373 Lin Alg/Diff Eq (1372)</td>
</tr>
<tr>
<td>Chem 2301 Organic Chem I (1062/66)</td>
<td>Chem 4501 Intro to Thermo (1062/66, &amp;Math 2374, Phys 1302)</td>
</tr>
<tr>
<td>BBE 4043 BP Engineering Lab I (UD, Chem 2301)</td>
<td>BBE 2003 Comp App in BBE* (Math 1372, &amp;2373 or &amp;2374)</td>
</tr>
<tr>
<td>Emphasis Elective</td>
<td>Liberal Education course</td>
</tr>
</tbody>
</table>

*Students admitted prior to Fall 2017 may use STAT 3021 to satisfy requirement.

### About This Plan
- This plan is not a contract. Curriculum can change. The APAS is the official method for tracking completion of University degree requirements.
- Shaded courses are only offered in the indicated semester.
- Course pre-requisites and co-requisites (designated by &) are listed below the course number and title. Upper Division (UD) requires admission to the major prior to enrollment.
- Students can take either the CSE-only or University-wide versions of the math course (Math 1371/1271, Math 1372/1272, Math 1373/2243, Math 2374/2243).

### Applying to your Major

Students who have completed the required courses for admission to this major (double-boxed and one with dashed outline on plan) and have a 3.2 UM-TC technical GPA at the end of the fall semester will be guaranteed admission. All other students who have completed the required courses will be considered for admission on a space-available basis. Admission following the spring semester is only based on space availability. The major application database is available at z.umn.edu/csemajorapp.

### Total Credits Needed for Degree: 125

### Department Contact Information
- Website: www.bbe.umn.edu
- Main Phone: 612-625-5200
- Main Office: 203 Kauffert Lab & 213 BioAgEng Bldg St. Paul
- Director of Undergraduate Studies: Professor Ulrike Tschirner
- Email: tschi007@umn.edu

### University Degree Requirements

All students must complete the following Writing & Liberal Education requirements, as noted on their APAS report.

See link for full Core & Theme names: z.umn.edu/liberaleducation

### Writing Requirements:

**University Writing:**
- Write 1301/1401 or equivalent

**Writing Intensive (WI):**
- Two: 1xxx or 2xxx level **
- One: 3/4/5xxx level (in major)*
- One: 3/4/5xxx level (any dept.)*

Requirements with an (*) will be fulfilled by taking courses at UM-TC required for this major.

### Liberal Education

<table>
<thead>
<tr>
<th>CORES:</th>
<th>THEMES:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bio*</td>
<td>4 of 5:</td>
</tr>
<tr>
<td>Phy*</td>
<td>Civ</td>
</tr>
<tr>
<td>Hist</td>
<td>DSJ</td>
</tr>
<tr>
<td>SocS</td>
<td>Env*</td>
</tr>
<tr>
<td>Ltr</td>
<td>GP</td>
</tr>
<tr>
<td>AH</td>
<td>TS*</td>
</tr>
</tbody>
</table>

[Rev. Date: 5/2018]

Bioproducts and Biosystems Engineering

POSSIBLE POSITIONS

- **Alternative energy specialist:** Designs and installs systems that use renewable energy sources.
- **Bioprocessing/food engineer:** Integrates biology and engineering to design sustainable systems that produce high quality food, renewable energy, and biomaterials for consumers while protecting the environment.
- **Bioproducts engineer:** Develops sustainable biomass conversion solutions to meet the world’s growing materials and energy demand.
- **Environmental consultant:** Offers expert advice to local, state, and federal government agencies and private sector clients who need to adopt environmentally sound practices or clean up contaminated sites.
- **Environmental engineer:** Addresses the many environmental and natural resource challenges that affect air, soil, and water quality.
- **Process engineer:** Develops the series of actions that efficiently and economically make products (plastics, chemicals, fuel, pharmaceuticals, etc.)
- **Product engineer:** Plans and develops the tools, processes, machines, and equipment necessary to produce or manufacture products.
- **Research engineer:** Conducts basic, systematic investigations leading to new knowledge for a specific application that influences the design and construction of prototypes.

**Some of these positions may require an advanced degree.**

INDUSTRIES

- Agriculture
- Alternative energy
- Building products/materials
- Consulting
- Ecological restoration
- Ecology/environmental research
- Environmental consulting
- Food processing
- Food safety and security
- Government agencies
- Institutes
- Laboratories
- Law
- Manufacturing
- Marketing
- Public health
- Pulp and paper products
- Quality control
- Renewable plastics
- Research
- University laboratories
- Wood products

EMPLOYERS

- 3M
- Andersen Corporation
- Appvion, Inc.
- Barr Engineering
- Cargill
- CHS Inc.
- Domtar Paper Company
- Donaldson
- Ecolab
- General Mills
- Kellogg’s
- Minnehaha Creek Watershed Dist.
- MN Pollution Control Agency
- Natureworks
- POET
- Renewable Energy Group
- The Schwan Food Company
- Virent
- Verso Paper
- Westwood Professional Services
- WSB/Water Resources Group

CSE Career Outcomes

Average Starting Salary: $59,077*

Post-graduation Outcomes:*  
**Grad School:** 5.6%
**Employed:** 94.4%

*Salary and Career Outcomes gathered from the 2016-2017 CSE Graduation Survey
Post-graduation outcomes reflect the percentage of students who were employed full-time in their field or were enrolled in a graduate program.

More Information

Career Center: cse.umn.edu/career
Salary Information: z.umn.edu/csesalary
More Information on Undergraduate Majors: cse.umn.edu/majors

Please visit the Career Center to continue exploring this major.