# CHEMICAL FOCUS AREA: Sustainability

Department of Chemical and Biochemical Engineering

<table>
<thead>
<tr>
<th>General Education (19 sh)</th>
<th>sh</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL RHET:1010 Rhetoric</td>
<td></td>
</tr>
<tr>
<td>F/S Diversity &amp; Inclusion</td>
<td>3</td>
</tr>
<tr>
<td>ALL Be Creative</td>
<td>3</td>
</tr>
<tr>
<td>ALL Approved Gen Ed Course</td>
<td>3</td>
</tr>
<tr>
<td>ALL Approved Gen Ed Course</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Math &amp; Basic Science Core (28 sh)</th>
<th>sh</th>
</tr>
</thead>
<tbody>
<tr>
<td>F/S MATH:1550 Math I: Single Variable Calculus (P: ALEKS score ≥ 75 or MPT Level 3 score ≥ 8)</td>
<td>4</td>
</tr>
<tr>
<td>ALL MATH 1540 Math II: Multivariable Calculus (P: MATH:1550)</td>
<td>4</td>
</tr>
<tr>
<td>ALL MATH:2510 Math III: Matrix Algebra (P: MATH:1550)</td>
<td>2</td>
</tr>
<tr>
<td>ALL MATH:2560 Math IV: Differential Equations (P: MATH:1550 &amp; MATH:2550)</td>
<td>3</td>
</tr>
<tr>
<td>ALL CBE:2105 Appl Stat Chem &amp; Natural Resource Engr</td>
<td>3</td>
</tr>
<tr>
<td>ALL STAT:3100 Biostatistics</td>
<td>3</td>
</tr>
<tr>
<td>ALL CHEM:1110 Principles of Chemistry I (P: ALEKS score ≥ 55 or MPT Level 2 score ≥ 8)</td>
<td>4</td>
</tr>
<tr>
<td>ALL PHYS:1611 Introductory Physics I / Lab (P: MATH:1550)</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Engineering Core (7 sh)</th>
<th>sh</th>
</tr>
</thead>
<tbody>
<tr>
<td>F ENGR:1000 Engineering Success for First-Year Students (First semester standing)</td>
<td>1</td>
</tr>
<tr>
<td>F ENGR:1100 Intro to Engineering Problem Solving</td>
<td>3</td>
</tr>
<tr>
<td>F/S ENGR:1300 Intro to Engineering Computing (P: MATH:1550)</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ChemE Requirements (51 sh)</th>
<th>sh</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL CHEM:1120 Principles of Chemistry II (P: CHEM:1110 with a minimum grade of C)</td>
<td>4</td>
</tr>
<tr>
<td>ALL CHEM:2210 Organic Chemistry I (P: CHEM:1120 with a minimum grade of C)</td>
<td>3</td>
</tr>
<tr>
<td>F CHEM:2220 Organic Chemistry I for Majors (P: CHEM:1120 with a minimum grade of C)</td>
<td>3</td>
</tr>
<tr>
<td>S CHEM:2240 Organic Chemistry II for Majors (P: CHEM:2210 or CHEM:2230 with a minimum grade of C)</td>
<td>3</td>
</tr>
<tr>
<td>ALL CHEM:2410 Organic Chemistry Laboratory (P: CHEM:1120 (OR CHEM:2210) OR CHEM:2230), both with a minimum grade of C; C: CHEM:2220 or CHEM:2240)</td>
<td>3</td>
</tr>
<tr>
<td>S CHEM:3420 Organic Chemistry Lab for Majors (P: CHEM:1120 (OR CHEM:2210) OR CHEM:2230), both with a minimum grade of C; C: CHEM:2220 or CHEM:2240)</td>
<td>3</td>
</tr>
</tbody>
</table>

| All ENGR:2100 Thermodynamics (P: CHEM:1110 & PHYS:1611, C: CHEM:1150) |  3   |
| ALL ENGR:2700 Materials Science (P: CHEM:1150, CHEM:1155) |  3   |
| F CBE:2110 Computational Tools for Chemical Engineers (P: MATH:1550, C: MATH:1560) |  2   |
| F/S CBE:2105 Process Calculations (P: MATH:1510) |  3   |
| S CBE:2105 ChE Thermodynamics (P: ENGR:2100; C: CHEM:2100) |  3   |
| S CBE:3109 Fluid Flow (C: CHEM:2100) |  3   |
| F/S CBE:3117 Separations (P: CHEM:2105 & CHEM:3110, R: CHEM:3110) |  3   |
| F/S CBE:3120 Chemical Reaction Engineering (P: MATH:2540, C: CHEM:3100, R: CHEM:3110) |  3   |
| F CBE:3121 Chemical Process Safety (P: CHEM:3105 & CHEM:3109; C: CHEM:3110) |  3   |
| S CBE:3150 Thermodynamics / Transport Laboratory (P: CHEM:2105 & CHEM:3112) |  3   |
| F CBE:3155 Chemical Reaction Engineering / Separation Lab (P: CHEM:3117; C: CHEM:3120; R: Statistics Elective) |  3   |
| S CBE:3105 Introduction Biochemical Engineering (P: CHEM:2105, R: CHEM:3100; R: CHEM:3120) |  3   |
| F CBE:4105 Process Dynamics & Control |  3   |

<table>
<thead>
<tr>
<th>ChemE Capstone Design Courses (1 sh)</th>
<th>sh</th>
</tr>
</thead>
<tbody>
<tr>
<td>S CBE:4110 Chemical Engineering Process Design II (P: CBE:3100, R: CBE:4105 &amp; CHEM:3125)</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ChemE Departmental Seminars (5 sh)</th>
<th>sh</th>
</tr>
</thead>
<tbody>
<tr>
<td>S CBE:1000 CHEM Departmental Seminar</td>
<td>1</td>
</tr>
<tr>
<td>F/S CBE:1000 CHEM Professional Seminar</td>
<td>1</td>
</tr>
<tr>
<td>F/S CBE:1000 CHEM Professional Seminar</td>
<td>4</td>
</tr>
<tr>
<td>S CBE:4195 Senior Enriching Activities Seminar (C: CHEM:4120)</td>
<td>0</td>
</tr>
</tbody>
</table>

---

**Be Creative General Education Courses**

<table>
<thead>
<tr>
<th>sh</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHNR:2740 The Art and Craft of Writing about the Environment (see MyUI for offerings)</td>
</tr>
<tr>
<td>CIW:3210 Creative Writing and the Natural World (see MyUI for offerings)</td>
</tr>
</tbody>
</table>

**General Education courses**

<table>
<thead>
<tr>
<th>sh</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL GEOG:1070 Contemporary Environmental Issues</td>
</tr>
<tr>
<td>F/S GEOG:2013 Introduction to Sustainability</td>
</tr>
<tr>
<td>F/S ENGL:1510 Introduction to Environmental Literature</td>
</tr>
<tr>
<td>OR F/S JMC:1800 Introduction to Environmental Communication in the Digital Age</td>
</tr>
</tbody>
</table>

**Advanced Chemistry/Science Electives**

<table>
<thead>
<tr>
<th>sh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Chemistry or Chemistry Course</td>
</tr>
<tr>
<td>CBE:5425 Atmospheric Chemistry and Physics (C: CHEM:2120) (Spring semester, even years)</td>
</tr>
</tbody>
</table>

**EFA Electives**

<table>
<thead>
<tr>
<th>sh</th>
</tr>
</thead>
<tbody>
<tr>
<td>S CBE:4410 Sustainable Systems</td>
</tr>
<tr>
<td>F/S EES:1080 Introduction to Environmental Science</td>
</tr>
<tr>
<td>OR F EES:1085 Fundamentals of Environmental Science</td>
</tr>
<tr>
<td>Dynamic Systems of Human Systems course (see Note 2)</td>
</tr>
<tr>
<td>Additional Sustainability Certificate course or 3000-level science or engineering course</td>
</tr>
</tbody>
</table>

Note 1: Completion of all the courses listed above will result in the completion of a B.S. Degree in Chemical Engineering and a Certificate in Sustainability. Must apply for the Sustainability Certificate on MyUI.

Note 2: The Certificate in Sustainability requires 12 s.h. Introductory Core courses, 3 s.h. from each of the 3 Breath Electives categories (Dynamics of Natural Systems, Dynamics of Human Systems, & Communication, Ethics, and Interpretation) and 1 s.h. from the Project/Integrative Systems category, for a total of 24 s.h. (see the Sustainability section in the UI General Catalog[1]).


---

**Chemical Engineering Program Requirements**

- **ChemE Departmental Seminars**: 5 sh
- **ChemE Capstone Design Courses**: 1 sh
- **ChemE Requirements**: 51 sh
- **Chemical Focus Area**: Sustainability
- **General Education courses**: 9 sh
- **Advanced Chemistry/Science Electives**: 6 sh
- **EFA Electives**: 12 sh

---

[Department of Chemical and Biochemical Engineering](https://catalog.registrar.uiowa.edu/university-college/sustainability/certificate/)