CHEMISTRY: ENVIRONMENTAL CHEMISTRY, BS

For the Degree of Bachelor of Science in Chemistry, Environmental Chemistry Concentration

department website: https://chemistry.illinois.edu
department faculty: Chemistry Faculty (https://chemistry.illinois.edu/directory/faculty-by-type)
advising: SCS Academic Advising (http://advising.scs.illinois.edu)
overview of college admissions & requirements: Liberal Arts & Sciences (http://catalog.illinois.edu/schools/las/academic-units)
college website: https://las.illinois.edu/

This concentration is designed to provide a background in environmental chemistry that is sufficient in breadth and depth to prepare a person to work as an environmental chemist in the public or private sectors and/or to pursue an advanced degree in the field. Students who complete this concentration will be certified in environmental chemistry by the American Chemical Society (ACS). The Environmental Chemistry Concentration is based on the Specialized Curriculum in Chemistry. Students will take a 3-hour, 300-level course in environmental chemistry and three 3-hour, upper level technical courses in environmental areas. These courses can be used as part of the required 14 hours of technical electives for the Specialized Curriculum in Chemistry.

Undergraduate Degree Programs in Chemistry

For the Degree of Bachelor of Science in Liberal Arts and Sciences

- Major in Computer Science & Chemistry, BSLAS (http://catalog.illinois.edu/undergraduate/eng_las/computer-science-chemistry-bslas)
- Major in Chemistry (Sciences and Letters) (http://catalog.illinois.edu/undergraduate/las/chemistry-bslas/degree-requirement-text)
- Major in Chemistry (Sciences and Letters), Chemistry Teaching Concentration (http://catalog.illinois.edu/undergraduate/las/chemistry-bslas/chemistry-teaching)

For the Degree of Bachelor of Science in Chemistry

- Major in Chemistry (Specialized Curriculum) (http://catalog.illinois.edu/undergraduate/las/chemistry-bs/
  #degree-requirement-text)
- Major in Chemistry (Specialized Curriculum), Environmental Chemistry Concentration (p. 1)

For the Degree of Bachelor of Science in Chemistry, Environmental Chemistry Concentration

General education: Students must complete the Campus General Education requirements including the campus general education language requirement.

Minimum hours required for graduation: 120 hours.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>CHEM 202</td>
<td>Accelerated Chemistry I</td>
<td></td>
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<tr>
<td>CHEM 203</td>
<td>Accelerated Chemistry Lab I</td>
<td></td>
</tr>
<tr>
<td>CHEM 204</td>
<td>Accelerated Chemistry II</td>
<td></td>
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<tr>
<td>CHEM 205</td>
<td>Accelerated Chemistry Lab II</td>
<td></td>
</tr>
<tr>
<td>CHEM 236</td>
<td>Fundamental Organic Chem I</td>
<td></td>
</tr>
<tr>
<td>CHEM 237</td>
<td>Structure and Synthesis</td>
<td></td>
</tr>
<tr>
<td>CHEM 312</td>
<td>Inorganic Chemistry</td>
<td></td>
</tr>
<tr>
<td>CHEM 315</td>
<td>Instrumental Chem Systems Lab</td>
<td></td>
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<tr>
<td>CHEM 420</td>
<td>Instrumental Characterization</td>
<td></td>
</tr>
<tr>
<td>CHEM 436</td>
<td>Fundamental Organic Chem II</td>
<td></td>
</tr>
<tr>
<td>CHEM 442</td>
<td>Physical Chemistry I</td>
<td></td>
</tr>
<tr>
<td>CHEM 444</td>
<td>Physical Chemistry II</td>
<td></td>
</tr>
<tr>
<td>CHEM 445</td>
<td>Physical Principles Lab I</td>
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</table>

Advanced Chemistry

Chemistry/Biochemistry courses numbered 300 or higher, which must include one from the following: ¹

- CHEM 317 Inorganic Chemistry Lab
- CHEM 437 Organic Chemistry Lab
- CHEM 447 Physical Principles Lab II

Additional laboratory work: ²

- BIOC 455 Technqs Biochem & Biotech
- CHEM 317 Inorganic Chemistry Lab
- CHEM 437 Organic Chemistry Lab
- CHEM 447 Physical Principles Lab II
- CHEM 483 Solid State Structural Anlys

Additional chemistry/biochemistry courses to complete the 11-hour requirement in advanced chemistry (excluding CHEM 499)

Mathematics: ¹

- MATH 220 Calculus
- MATH 221 Calculus I
- MATH 231 Calculus II
- MATH 241 Calculus III

Physics: ¹

- PHYS 211 University Physics: Mechanics
- PHYS 212 University Physics: Elec & Mag
- PHYS 214 Uni Physics: Quantum Physics

Technical Electives, including the following: ¹

- Required Mathematics: ⁵

- MATH 225 Introductory Matrix Theory
  - or MATH 415 Applied Linear Algebra
- MATH 285 or equivalent

Strongly Recommended:

- CHEM 499 Senior Thesis (maximum of 10 hours)

Recommended: basic computer science

Other technical courses chosen from:

Information listed in this catalog is current as of 03/2020
Chemistry (300 or higher), biochemistry, chemical engineering (200 or higher)

Courses in life sciences (all courses at 200 or higher)

Mathematics or computer science above the basic level

Other courses in the physical and biological sciences and engineering including CHEM 199

Nontechnical Requirements

General education:

- Foreign language - three semesters of college study (or three years of high school study) in a single foreign language
- Composition I writing requirement (RHET 105, CMN 111 and CMN 112, or equivalent)
- Advanced Composition writing requirement
- Humanities/Arts to satisfy the campus general education requirements
- Social/Behavioral sciences to satisfy the campus general education requirements
- Cultural Studies to satisfy the campus general education requirement

Free electives

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Required Technical Elective Courses for the Environmental</td>
<td></td>
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<tr>
<td></td>
<td>Chemistry Concentration</td>
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<tr>
<td>Basic Courses</td>
<td>Chemistry of the Environment or CEE 330 Environmental Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Courses: Select three courses from the following:</td>
<td>9</td>
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<tr>
<td>CHEM 460</td>
<td>Green Chemistry</td>
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<tr>
<td>CEE 443</td>
<td>Env Eng Principles, Chemical</td>
<td></td>
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<td>GEOL 380</td>
<td>Environmental Geology</td>
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<tr>
<td>IB 485</td>
<td>Environ Toxicology &amp; Health</td>
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<tr>
<td>CHEM 397</td>
<td>Individual Study Junior</td>
<td></td>
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<tr>
<td>CHEM 497</td>
<td>Individual Study Senior</td>
<td></td>
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<tr>
<td>CHEM 499</td>
<td>Senior Thesis</td>
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<tr>
<td>Other 400-level courses dealing with economic, engineering, biological aspects of environmental chemistry upon consultation with the faculty advisor.</td>
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</tbody>
</table>

1. Hours given are those typical to meet requirement.
2. If necessary, CHEM 102 and CHEM 103, CHEM 104 and CHEM 105, CHEM 222, and CHEM 223 may be substituted for CHEM 202, CHEM 203, CHEM 204, and CHEM 205. Warning: CHEM 222 and CHEM 223 are offered only in the fall semester.
3. The course chosen from CHEM 317, CHEM 437, or CHEM 447 cannot be used to satisfy the additional chemistry lab requirement.
4. Students who present less than 6 semester hours credit in a combination of CHEM 397, CHEM 497 and/or CHEM 499 for graduation must complete two additional courses chosen from the list. Students who will present at least 6 semester hours credit in a combination of CHEM 397, CHEM 497 and/or CHEM 499 for graduation are required to complete only one laboratory course from the list.
5. Students contemplating transfer to the chemical engineering curriculum should choose MATH 415.
6. Three hours maximum credit in CHEM 199. Additional courses in the sciences and engineering can be taken upon the approval of the chair of the chemistry department advising committee. Most approved courses must have a strong technical prerequisite, such as one year of college-level math or science.
7. The requirements for the Campus General Education categories Natural Sciences and Technology and Quantitative Reasoning I and II are fulfilled through required course work in the curriculum.
8. The course taken to satisfy the Advanced Composition requirement may also be used to partially satisfy one of the core chemistry, advanced chemistry, mathematics, physics, or technical electives requirements (if appropriate), or may be used to partially satisfy the free electives requirements.
9. The courses taken to satisfy Western and/or Non-Western Civilization requirements may also be used to satisfy nontechnical and/or free elective categories.

Restrictions: (1) Courses preparatory to or used to satisfy the minimum requirements specified in the above requirements may not be included as free electives. (2) No first-year foreign language course (e.g., 101, 102, or equivalent) may be included unless it is a different language than used to satisfy the foreign language nontechnical requirement.