Biochemistry

Bachelor of Science
www.uis.edu/biochemistry/
Email: che@uis.edu
Office Phone: (217) 206-6589
Office Location: HSB 314

The Biochemistry curriculum is designed to prepare students for the biomedical sciences and/or health professions through a strong background in chemistry and its application to biological systems. The degree, hosted by the Chemistry Department, meets or exceeds the requirements for those students pursuing a professional degree, e.g. medicine, dentistry, and pharmacy, as well as those interested in graduate work in associated sciences, e.g. biochemistry, pharmacology, and molecular biology. The department is accredited by the America Chemical Society’s Committee on Professional Training and the curriculum meets the recommendations of the American Society for Biochemistry and Molecular Biology.

Undergraduate Research
One of the advantages of earning a Biochemistry degree from UIS is involvement in hands-on original lab research. The requirement is fulfilled by earning three credits of CHE 400 ECCE: Undergraduate Research. These credits can be earned on campus in a project with one of the Chemistry Department faculty, another faculty member in the Natural Science Division, or in an off-campus research internship. The three credits of CHE 400 meet the University requirements for three credits of ECCE Engaged Citizenship. The course includes a final written report of the research results and a professional presentation. Contact a Chemistry faculty member to discuss possible projects or to get approval of a research opportunity outside the department.

Additional Engaged Citizenship credits can be earned in an internship. There are local paid internships in the sciences. Contact the Internships and Prior Learning office for the current list of available internships at (217) 206-6640 (http://www.uis.edu/ipl/).

Honors in Biochemistry
Biochemistry majors may elect to participate in the honors program in Biochemistry. To graduate with honors in Biochemistry, a student must:

1. complete all degree requirements,
2. earn a minimum cumulative GPA of 3.0 for all UIS Chemistry courses and 3.50 for UIS courses overall, and
3. make a public presentation of the results of undergraduate research (CHE 400 or similar experiential learning project).
   Students must apply for honors designation to the chair of the Chemistry Department prior to their final semester at UIS.

The Bachelor’s Degree

Advising
Students wishing to major in Biochemistry should consult with an academic advisor upon admission to the University to make sure they are taking their required courses in the proper sequence. In order to declare a Biochemistry major, students need to complete a Change of Curriculum form on the Records and Registration website. There is no separate admission to the major.

First-year students should contact the science advisor in the Undergraduate Academic Advising Center. Students with more than 30 hours (transfer students and sophomores) should contact the College of Liberal Arts and Sciences Advising Professional.

It is imperative that students beyond their first year regularly consult with a faculty member in the Chemistry Department regarding their major. All students are assigned a faculty member as their primary advisor upon declaring their major in Biochemistry. We suggest that you meet with your faculty advisor at least one time each semester to discuss courses, careers, and research opportunities. To set an appointment, contact the office manager at (217) 206-6589.

Refer to the Chemistry website at www.uis.edu/chemistry/ to view the department’s Sample Curriculum/ Program Guide.

Assessment of Learning within the Discipline
A biochemist graduating from UIS will be characterized as being able to:

- Integrate chemical knowledge
- Perform appropriate laboratory skills
- Communicate scientific information
- Apply the scientific process(es)
- Participate in the biochemistry profession

Students majoring in biochemistry may be asked to participate in surveys of focus groups in order to assist the department in assessing the learning outcomes of the program. Other evidences of student learning (exam scores, research papers) will be used in an anonymous and confidential manner for Chemistry Department curriculum review and planning.

Grading Policy
Chemistry courses for which the student has attained a grade of C- or better will be applied toward their B.S. degree in biochemistry (grades of D+ or lower will not be accepted). Biochemistry majors may repeat program courses for grade improvement only once.

General Education
All biochemistry majors must fulfill the undergraduate general education requirements as described at the beginning of this catalog. Certain courses required for the UIS Biochemistry Bachelor of Science degree also fulfill general education requirements (listed in the table below). Consult with your academic advisor before registering to ensure that you take the correct courses in the correct sequence.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 141</td>
<td>Unity of Living Organisms</td>
<td>4</td>
</tr>
<tr>
<td>CHE 141</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>Mathematical Skills</td>
<td>MAT 115</td>
<td>Calculus I</td>
</tr>
<tr>
<td>Applied Mathematics</td>
<td>MAT 121</td>
<td>Applied Statistics</td>
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<tr>
<td>ECCE Engagement Experience</td>
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</tbody>
</table>
CHE 400  ECCE: Undergraduate Research  3
or CHE 302  ECCE: Undergraduate Research

Degree Requirements

Introductory Courses
BIO 241  Biology of Organisms in the Environment  4
CHE 141  General Chemistry I  4
CHE 142  General Chemistry II  4
CHE 267  Organic Chemistry I  3
CHE 268  Organic Chemistry I Laboratory  1
CHE 269  Organic Chemistry II  3
CHE 271  Organic Chemistry II Lab  1

Calculus (one year):
MAT 115  Calculus I  8
& MAT 116  and Calculus II

Physics (one year):
ASP 201  University Physics I  8
& ASP 202  and University Physics II

Total Hours  36

Transfer students with deficiencies in the introductory courses may enter the program conditionally but will be required to make up the deficiencies during their first year of study. This extra work may mean that some students will require more than four years to complete the B.S. degree. Transcripts submitted by transfer students must show that the following course requirement categories have been met:

• General Chemistry I and II
• Organic Chemistry with lab (one year)
• Calculus (one year)
• Introductory Biology with lab (one year)
• Physics, calculus based (one year)

Intermediate and Advanced Courses
CHE 301  General Seminar  3
or BIO 301  General Seminar
CHE 321  Chemical Analysis  4
CHE 400  ECCE: Undergraduate Research  3
or CHE 302  ECCE: Undergraduate Research
CHE 401  Physical Chemistry I - Thermodynamics  3
CHE 418  Bioanalytical Chemistry  3
CHE 475  General Biochemistry  3
CHE 476  General Biochemistry Laboratory  2
CHE 485  Advanced Biochemistry  4

400-level Chemistry Electives  3

Upper Division Biology Electives (choose from the list below):  6
BIO 311  Cell Biology
BIO 345  General Microbiology
BIO 381  Genetics
BIO 425  Medicinal Chemistry
or CHE 425  Medicinal Chemistry
BIO 432  Introduction to Neuroscience
or CHE 432  Introduction to Neuroscience

Total Hours  34

Degree Plan*

*Listed below is a SUGGESTED Degree Plan. For OFFICIAL program information, please refer to the catalog content above and consult your academic advisor.

Note: Chemistry and Biochemistry majors have the same suggested degree plan for the first two years.

Year 1

Fall  Hours
CHE 141  General Chemistry I  4
(or equivalent)
MAT 115  Calculus I  4
(or equivalent)
BIO 141  Unity of Living Organisms  4
Freshman Seminar (Humanities or Social Sciences)  3
Hours  15

Spring  Hours
CHE 142  General Chemistry II  4
(or equivalent)
MAT 116  Calculus II  4
(or equivalent)
BIO 241  Biology of Organisms in the Environment  4
ENG 101  Rhetoric and College Writing  3
Comparative Societies (Humanities or Social Sciences)  3
Hours  18

Year 2

Fall  Hours
CHE 267  Organic Chemistry I  3
(or equivalent)
CHE 268  Organic Chemistry I Laboratory  1
(or equivalent)
ASP 201  University Physics I  4
(or equivalent)
ENG 102  College Writing and Civic Engagement  3
MAT 121  Applied Statistics  3
General Education Requirement (Humanities or Social Sciences)  3
Hours  17

Spring  Hours
CHE 269  Organic Chemistry II  3
(or equivalent)
CHE 271  Organic Chemistry II Lab  1
(or equivalent)
ASP 202  University Physics II  4
(or equivalent)
<table>
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<tr>
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<tbody>
<tr>
<td>COM 112</td>
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**Year 3**

**Fall**

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>CHE 301</td>
<td>General Seminar</td>
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<tr>
<td>CHE 321</td>
<td>Chemical Analysis</td>
<td>4</td>
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<tr>
<td>CHE 475</td>
<td>General Biochemistry</td>
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<tr>
<td>CHE 476</td>
<td>General Biochemistry Laboratory</td>
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**Hours** 11

**Spring**

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<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CHE 302</td>
<td>ECCE: Undergraduate Research or 400</td>
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<tr>
<td>CHE 485</td>
<td>Advanced Biochemistry</td>
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</tr>
<tr>
<td></td>
<td>400-level Chemistry Elective</td>
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<tr>
<td></td>
<td>General Education Requirement (Visual, Creative and</td>
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<tr>
<td></td>
<td>Performing Arts Humanities)</td>
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<tr>
<td>ECCE U.S.</td>
<td>Community/Global Awareness</td>
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**Hours** 12

**Year 4**

**Fall**

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<tr>
<td>CHE 401</td>
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<td>Upper Division Biology Elective</td>
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</tr>
<tr>
<td>ECCE U.S.</td>
<td>Community/Global Awareness</td>
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<tr>
<td></td>
<td>General Education Requirement (Humanities or Social</td>
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<td></td>
<td>Sciences)</td>
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**Hours** 18

**Spring**

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<tbody>
<tr>
<td>CHE 418</td>
<td>Bioanalytical Chemistry</td>
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<td></td>
<td>Upper Division Biology Elective</td>
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<tr>
<td>UNI 301</td>
<td>ECCE: Speakers Series</td>
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<tr>
<td>Elective</td>
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**Hours** 13

**Total Hours:** 120