BS in Biochemistry

Biochemistry is the study of chemistry involving living organisms. Degrees in Biochemistry involve training in organic, inorganic, and physical chemistry as well as in biology, genetics, and biochemistry. Elective coursework is also available to pursue interests in a variety of advanced topics involving the chemistry of biological systems.

The Bachelor of Science degree is designed for students interested in an in-depth preparation, including advanced lab work. This degree is an excellent preparation for students interested in pursuing Chemistry or Biochemistry as a career. It also serves as excellent preparation for students applying to professional programs in medicine, dentistry, pharmacy and other health allied fields.

Admissions

See Admissions for information about entrance pathways and application instructions.

Degree Requirements

BS Biochemistry Checklist (PDF)

Mathematics (choose one sequence)
- Regular: MATH 124 (5), 125 (5), 126 (5)
- Honors: MATH 134 (5), 135 (5), 136 (5)

Physics (choose one sequence)
- Calculus-based: PHYS 121 (5), 122 (5), 123 (5)
- Algebra-based: PHYS 114 (4), 115 (4), 116 (4)

The calculus based series is recommended.

General Chemistry (choose one sequence)
- Regular: CHEM 142 (5), 152 (5), 162 (5)
- Honors: CHEM 145 (5), 155 (5), 165 (5)
- Accelerated: CHEM 143 (6), 153 (6)

Organic Chemistry (choose one sequence)
- Regular: CHEM 237 (4), 238 (4), 239 (4)
  - Laboratory: 241 (3), 242 (3)
- Honors: CHEM 335 (4), 336 (4), 337 (4)
  - Laboratory: 346 (3), 347 (3)

Organic laboratory begins with the second lecture course.
Biology
- BIOL 180 (5), 200 (5)

Biochemistry
- BIOC 440 (4), 441 (4), 442 (4), 426 Laboratory (4)

Students may petition research experience be used for exemption from BIOC 426 lab. Consult advisers.

Genome Science
- Genome 371 (5) or Genome 361 (3)

Physical Chemistry (choose one sequence)
- P-Chem for Biochemists: CHEM 452 (3), 453 (3)
- Regular: CHEM 455 (3), 456 (3), 457 (3)

Science Electives
Eleven credits from courses on the following list:

- AMATH 351, 352, 410, 422, 423
- ATM S 358, 458
- BIOL 220, 300, 355, 401, 402, 411, 457, 459
- BIOST 310
- BSE 406
- CSE 427
- ENV H 431
- ESS 312, 457
- GENOME 372, 373, 465
- IMMUN 441
- MATH 307, 308
- MICROM 402, 410, 411, 412, 431, 445
- MSE 471, 475
- NBIO 404
- OCEAN 400
- Q SCI 381
- STAT 311

Advanced Research: Up to 9 credits of advanced undergraduate research may count toward this requirement. Research conducted outside of Chemistry or Biochemistry must first be approved by one of the undergraduate advisers.

- Additional 400 level science courses may be considered for science electives after consultation and a petition is submitted to the biochemistry advisers.
- Credit not allowed for both Math 307 and Amath 351 or for both Math 308 and Amath 352 toward science elective requirement.
Sample Schedule

<table>
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<tr>
<th>Year</th>
<th>Autumn Courses</th>
<th>Winter Courses</th>
<th>Spring Courses</th>
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| 1st Year | Math 124 (5)  
Chem 142 (5)  
Foreign Lang 101 (5) | Math 125 (5)  
Chem 152 (5)  
Foreign Language 102 (5) | Math 126 (5)  
Chem 162 (5)  
Foreign Language 103 (5)  
Electives (2) |
| 2nd Year | Biol 180 (5)  
Chem 237 (4)  
Electives (7) | Biol 200 (5)  
Chem 238 (4)  
Chem 241 (3)  
I&S (5)* | Chem 239 (3)  
Chem 242 (3)  
English Comp (5)*  
VLPA (5) |
| 3rd Year | Bioc 440 (4)  
Phys 121 (5)  
I&S (5)*  
Electives (2) | Bioc 441 (4)  
Phys 122 (5)  
VLPA (5)*  
Electives (3) | Bioc 442 (4)  
Phys 123 (5)  
VLPA "W" (5)  
Electives (3) |
| 4th Year | Bioc 426 (4)  
I&S "W" (5)  
Science Electives (8) | Chem 452 (3)  
Science Electives (3)  
VLPA (5)*  
Electives (5) | Chem 453 (3)  
Genome 361 (3)  
I&S (5)*  
Electives (3) |

*Visual, Literary and Performing Arts (VLPA) & Individuals and Societies (I&S).

Students are strongly encouraged to include undergraduate research in their curricula. Chem 299 and 499 can replace the “W” credits shown.

Students are expected to understand and complete all general education requirements as detailed in the General Catalog.

Undergraduate advisers can help set up individual schedules according to students’ needs and constraints.

Note that registration for BIOC 426 is restricted during period 1 registration to seniors who have applied to graduate.

Major Credit and Grade Point Checklist

- Biochemistry degree requires 193 credits.
  
  **NOTE:** Model Schedule above plans for up to 18 credits per quarter, which is above the standard 15. Students’ credit loads may vary. Time to degree completion will vary on a case-by-case basis.

- A minimum grade of 2.0 and a cumulative major GPA of 2.50 are required for all CHEM, BIOL, & BIOC courses counted toward the major.

- A minimum cumulative GPA of 2.50 is required in the BIOC 440, 441, 442 sequence.

- An overall cumulative grade point average of 2.50 is also required.

- All required courses must be taken for a decimal grade, unless only offered on a CR/NC basis.

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