Biochemistry Option
Bachelor of Science (BS)

Biochemistry deals with the chemical foundations and properties for all living processes. Research by biochemists increases our knowledge about chemicals and processes that govern the living world and has led to the discovery and development of new and improved medicines, agricultural breakthroughs, and other areas that unveil the mysteries of living things. Those interested in a rewarding career that provides financial security, promotes self-respect and offers the opportunity to work on stimulating and breakthrough projects, should consider a career in chemistry with a biochemistry option.

The biochemistry curriculum prepares students for careers in biochemistry, chemistry and biotechnology and provides an excellent basis for graduate and professional areas of study.

Chemistry students will...
• Gain a rigorous foundation in biochemistry, chemistry, science and math in the context of a broad university education.
• Interact closely with experienced faculty who are recognized for their writing, training, professional affiliations, and expertise.
• Study in the state-of-the-art, first-rate learning environment provided by the newly renovated Magill Hall of Science.
• Have opportunities to pursue research and scholarship that help develop independent thinking and problem solving.
• Have employment opportunities within the department that can provide chemistry-related work experience prior to graduation.

Career Planning
Career preparation is part of the mission of Southeast. In fact, more than 90% of Southeast students participate in internships, clinical opportunities, student teaching, research assistantships, and study abroad.

Approximately 35-40% of chemistry graduates pursue graduate or professional programs of study immediately upon graduation. The others pursue employment opportunities in chemistry or other fields. Employment opportunities for chemists exist in a variety of fields, such as biotechnology, biochemistry, chemical manufacturing, environmental monitoring and compliance, industrial hygiene, materials science, pharmaceutical manufacturing, product development, quality control, sales (pharmaceuticals, chemicals, instruments), and technical management.

Professional career counselors are available for all students. The Office of Career Services in Academic Hall 057 can provide students with professional career counseling, resume critiques, practice interviews, job search strategies, career events, networking opportunities, and more.

Internship Opportunities, Employment Opportunities, Graduate Schools and Programs of Recent Graduates

- Biokyowa
- Buzzi Unicem USA
- Eli Lilly
- Exxon Mobil
- Monsanto
- Pharmacia (currently part of Pfizer)
- PPG Industries
- Proctor and Gamble
- Sigma-Aldrich
- Missouri State Highway Patrol Crime laboratory
- Indiana University
- John Hopkins University
- Penn State University
- Purdue University
- Southern Illinois University (School of Medicine)
- Texas A & M
- University of Illinois (School of Medicine, Graduate School)
- University of Missouri – Columbia (School of Medicine, Graduate School)
- University of Notre Dame
- University of Wisconsin – Madison
- Washington University
- Numerous other graduate/professional programs of study and employers

Demonstrated Career Proficiency is a Requirement of all Southeast Students

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL001/CL002</td>
<td>First Semester Complete the FOCUS2 assessment and develop a Career Action Plan.</td>
</tr>
<tr>
<td>CL003</td>
<td>Junior Year Students gain information about career planning and job searching resources.</td>
</tr>
<tr>
<td>CL004</td>
<td>Senior Year Students demonstrate advanced proficiency by identifying a position in their field, developing a cover letter, and tailoring a resume for the position. Materials are critiqued to ensure preparedness for a successful job search.</td>
</tr>
</tbody>
</table>
This is a guide based on the 2015-2016 Undergraduate Bulletin and is subject to change. The time it takes to earn a degree will vary based on several factors such as dual enrollment, remediation, and summer enrollment. Students will meet with an academic advisor each semester and use DegreeWorks to monitor their individual progress.

**CURRICULUM CHECKLIST**

Business students must be admitted to the College of Business prior to enrolling in upper division (300 level or above) business courses.

**Chemistry Core – 34 Hours Required**
- CH185 General Chemistry (5) (Physical Systems)
- CH186 Foundations of Inorganic Chemistry (3)
- CH187 Inorganic Chemistry and Qualitative Analysis Laboratory (2)
- CH271 Foundations of Analytical Chemistry (5)
- CH311 Foundations of Physical Chemistry (4)
- CH313 Physical Chemistry Laboratory (3)
- CH341 Foundations of Organic Chemistry (4)
- CH342 Organic Chemistry Laboratory I (1)
- CH498 Professional Presentation in Chemistry (1)
- CH531 Foundations of Biochemistry (3)
- OR
- UI331 Foundations of Biochemistry (3)
- UI443 Professional Experience in Chemistry (3)

**Biochemistry Option Courses – 25 Hours Required**
- BI154 Genetics and Cellular Biology (4)
- BI200 Microbiology (3)
- BI381 Molecular Genetics (3)
- BI404 Cell Biology (3)
- CH312 Advanced Physical Chemistry (3)
- CH343 Advanced Organic Chemistry (3)
- CH344 Organic Chemistry Laboratory II (2)
- CH342 Advanced Biochemistry (2)
- CH533 Biochemistry Laboratory (2)

**Additional Requirements – 19 Hours Required**
- MA140 Analytical Geometry and Calculus I (5) (Logical Systems)
- MA145 Analytical Geometry and Calculus II (4)
- PH120/020 Introductory Physics I (5)
- PH121/021 Introductory Physics II (5)
- OR
- PH230/030 General Physics I (5)
- PH231/031 General Physics II (5)

Note: Completion of an experiential learning project (undergraduate research or internship) in the major is required. The departmental advisor should be consulted for information about this requirement.

**University Studies Requirements (not already listed above):**
- UI100 First Year Seminar, EN100 English Composition, Artistic Expression, Written Expression, Oral Expression, Literary Expression, Behavioral Systems, Living Systems, Development of a Major Civilization, Economic Systems, Political Systems, Social Systems, and one IU/UI3XX*

* Note: Two IU/UI3XX courses are required if CH531 Foundations of Biochemistry is taken rather than UI331 Foundations of Biochemistry.

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**SAMPLE FOUR-YEAR PLAN**

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<tr>
<th>Course #</th>
<th>Fall Semester</th>
<th>Spring Semester</th>
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<tbody>
<tr>
<td>UI100</td>
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<td>CH186</td>
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<tr>
<td>EN100</td>
<td>3</td>
<td>CH187</td>
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<tr>
<td>CH185/085/005</td>
<td>5</td>
<td>B154</td>
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<tr>
<td>Living Systems</td>
<td>3</td>
<td>MA140</td>
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<td></td>
<td>Total</td>
<td>Written Expression</td>
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<td>First Year</td>
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Milestone: maintain 2.0 cumulative GPA

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<td>B1200</td>
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<td>B1381</td>
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<tr>
<td>CH271</td>
<td>5</td>
<td>CH341</td>
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<tr>
<td>MA145</td>
<td>4</td>
<td>CH342</td>
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<tr>
<td>PH120/020 or PH230/030</td>
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<td>PH121/021 or PH231/031</td>
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<td></td>
<td>Total</td>
<td>Literary Expression</td>
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<td>Second Year</td>
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Milestone: maintain 2.0 cumulative GPA

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<tr>
<td>CH311</td>
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<tr>
<td>CH343</td>
<td>3</td>
<td>CH313</td>
</tr>
<tr>
<td>CH344</td>
<td>2</td>
<td>UI443</td>
</tr>
<tr>
<td>Oral Expression</td>
<td>3</td>
<td>Social Systems</td>
</tr>
<tr>
<td>Political Systems</td>
<td>3</td>
<td>Behavioral Systems</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>Total</td>
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</table>

Milestone: maintain 2.0 cumulative GPA

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<tr>
<th>Course #</th>
<th>Fall Semester</th>
<th>Spring Semester</th>
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<tbody>
<tr>
<td>BI404</td>
<td>3</td>
<td>CH498</td>
</tr>
<tr>
<td>UI331 or CH531</td>
<td>3</td>
<td>CH532</td>
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<tr>
<td>Artistic Expression</td>
<td>3</td>
<td>CH533</td>
</tr>
<tr>
<td>Develop of Major Civ</td>
<td>3</td>
<td>Economic Systems</td>
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<tr>
<td>IU/UI3XX</td>
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<td>Elective</td>
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<td>Total</td>
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Milestone: maintain 2.0 cumulative GPA

Degree requirements for all students: a minimum of 120 credit hours, completion of University Studies program, career proficiencies (CL001-004), Writing Proficiency Exam (WP003), and completion of the Measure of Academic Proficiency and Progress (MAPP) at the freshman and senior levels.

A minimum 2.0 GPA in the major and overall are required to graduate with a BS in Chemistry degree.

Refer to the Undergraduate Bulletin or DegreeWorks for additional graduation requirements (i.e. minimum GPA and coursework) for your program of study.

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To learn more
Office of Admissions
(573) 651-2590
admissions@semo.edu
www.semo.edu

To explore the College of Science, Technology, and Agriculture online, visit www.semo.edu/costa

For advising
College of Science, Technology and Agriculture Advising Center (573) 651-5930
costaadvising@semo.edu
www.semo.edu/costa/advising

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