## MAJOR IN BIOCHEMISTRY, PRE-PHARMACY CONCENTRATION

This concentration augments the General Biochemistry concentration with additional coursework in physiology, microbiology, immunology, and public speaking. This concentration fulfills the prerequisite courses for admission to most pharmacy schools. It is also an appropriate concentration for a career as a medical technician.

### Requirements

**Effective Fall 2018**

A minimum grade of C (2.000) must be earned for BC 493 and all biochemistry (BC) and LIFE subject code lecture and laboratory courses at or above the 200-level required in the biochemistry major.

### Freshman

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>AUCC</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC 192</td>
<td>Biochemistry Freshman Seminar</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>CHEM 111</td>
<td>General Chemistry I (GT-SC2)</td>
<td>3A</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 112</td>
<td>General Chemistry Lab I (GT-SC1)</td>
<td>3A</td>
<td>1</td>
</tr>
<tr>
<td>CHEM 113</td>
<td>General Chemistry II</td>
<td></td>
<td>3</td>
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<tr>
<td>CHEM 114</td>
<td>General Chemistry Lab II</td>
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<tr>
<td>CO 150</td>
<td>College Composition (GT-CO2)</td>
<td>1A</td>
<td>3</td>
</tr>
<tr>
<td>LIFE 102</td>
<td>Attributes of Living Systems (GT-SC1)</td>
<td>3A</td>
<td>4</td>
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<tr>
<td>LIFE 201B</td>
<td>Introductory Genetics: Molecular/Immunological/Development (GT-SC2)</td>
<td>3A</td>
<td>3</td>
</tr>
<tr>
<td>LIFE 203</td>
<td>Introductory Genetics Laboratory</td>
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</tbody>
</table>

Select one group from the following:

- **Group A:**
  - MATH 155  Calculus for Biological Scientists I (GT-MA1)  1B
  - MATH 255  Calculus for Biological Scientists II  1B

- **Group B:**
  - MATH 160  Calculus for Physical Scientists I (GT-MA1)  1B
  - MATH 161  Calculus for Physical Scientists II (GT-MA1)  1B

**Total Credits**: 31

### Sophomore

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>AUCC</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 341</td>
<td>Modern Organic Chemistry I</td>
<td></td>
<td>3</td>
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<tr>
<td>CHEM 343</td>
<td>Modern Organic Chemistry II</td>
<td></td>
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<tr>
<td>CHEM 344</td>
<td>Modern Organic Chemistry Laboratory</td>
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<tr>
<td>ECON 202</td>
<td>Principles of Microeconomics (GT-SS1)</td>
<td>3C</td>
<td>3</td>
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<tr>
<td>LIFE 210</td>
<td>Introductory Eukaryotic Cell Biology</td>
<td></td>
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<td>LIFE 212</td>
<td>Introductory Cell Biology Laboratory</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>SPCM 200</td>
<td>Public Speaking</td>
<td></td>
<td>3</td>
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</tbody>
</table>

Select one course from the following:

- BMS 300  Principles of Human Physiology  4
- BMS 360  Fundamentals of Physiology  4

Select one course from the following:

- **PH 121**  General Physics I (GT-SC1)  3A
- **PH 141**  Physics for Scientists and Engineers I (GT-SC1)  3A

**Total Credits**: 28

### Junior

<table>
<thead>
<tr>
<th>Course</th>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BC 401</td>
<td>Comprehensive Biochemistry I</td>
<td>4A</td>
<td>3</td>
</tr>
<tr>
<td>BC 403</td>
<td>Comprehensive Biochemistry II</td>
<td>4B</td>
<td>3</td>
</tr>
<tr>
<td>BMS 301</td>
<td>Human Gross Anatomy</td>
<td></td>
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<tr>
<td>BMS 302</td>
<td>Laboratory in Principles of Physiology</td>
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</tr>
<tr>
<td>MIP 300</td>
<td>General Microbiology</td>
<td></td>
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</table>

**Total Credits**: 3
MIP 302: General Microbiology Laboratory (2)

Select one course from the following:

- PH 122: General Physics II (GT-SC1) (3A)
- PH 142: Physics for Scientists and Engineers II (GT-SC1) (3A)

Select one course from the following:

- STAT 301: Introduction to Statistical Methods (3)
- STAT 307: Introduction to Biostatistics (3)
- STAT 315: Statistics for Engineers and Scientists (3)

Advanced Writing (2) and Foundations and Perspectives (3B, 3D, 3E, 3)

Total Credits: 32

Senior

BC 404: Comprehensive Biochemistry Laboratory (4B, 2)
BC 411: Physical Biochemistry (4)
BC 493: Senior Seminar (4A, 4C, 1)

Select one course from the following:

- BC 463: Molecular Genetics (3)
- BC 465: Molecular Regulation of Cell Function (3)

Select one course from the following:

- BC 499A: Thesis: Laboratory Research-Based (4C)
- BC 499D: Thesis: Literature-based in Pre-Pharmacy (4C)

Foundations and Perspectives (3B, 3D, 3E, 9)

Electives (2, 7)

Total Credits: 29

Program Total Credits: 120

1. Select from the list of courses in categories 3B, 3D, 3E (six credits [two courses] must come from 3B; one course each from categories 3D and 3E) in the AUCC. Only 3 of the 6 credits required for Arts and Humanities may come from intermediate (L*** 200 and L*** 201) foreign language courses. Students should plan on taking ECON 202 as the AUCC Cat 3C requirement.

2. Select enough elective credits to bring the program total to a minimum of 120 credits, of which at least 42 must be upper-division (300- to 400-level).

Major Completion Map

Distinctive Requirements for Degree Program:

TO PREPARE FOR FIRST SEMESTER: The curriculum for the Biochemistry major - Pre-Pharmacy concentration assumes students enter college prepared to begin a year-long calculus sequence (either MATH 155/MATH 255 or MATH 160/MATH 161) in the first semester of their first year. LIFE 102 requires high school chemistry as a prerequisite; CHEM 111 requires Algebra II as a prerequisite (this prerequisite is met by having Algebra II by test credit, transfer credit, or placement out of MATH 117 and MATH 118 on Math Placement Exam).

Freshman

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Critical</th>
<th>Recommended</th>
<th>AUCC</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC 192: Biochemistry Freshman Seminar</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>CHEM 111: General Chemistry I (GT-SC2)</td>
<td>X</td>
<td></td>
<td>3A</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 112: General Chemistry Lab I (GT-SC1)</td>
<td>X</td>
<td></td>
<td>3A</td>
<td>1</td>
</tr>
<tr>
<td>LIFE 102: Attributes of Living Systems (GT-SC1)</td>
<td>X</td>
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<td>3A</td>
<td>4</td>
</tr>
<tr>
<td>Select one course from the following:</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>MATH 155: Calculus for Biological Scientists I (GT-MA1)</td>
<td>X</td>
<td></td>
<td>1B</td>
<td></td>
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<tr>
<td>MATH 160: Calculus for Physical Scientists I (GT-MA1)</td>
<td>X</td>
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Total Credits: 15

<table>
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<tr>
<th>Semester 2</th>
<th>Critical</th>
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<th>AUCC</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 113: General Chemistry II</td>
<td>X</td>
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<td>3</td>
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<tr>
<td>CHEM 114: General Chemistry Lab II</td>
<td>X</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>CO 150: College Composition (GT-CO2)</td>
<td>X</td>
<td></td>
<td>1A</td>
<td>3</td>
</tr>
</tbody>
</table>
### Major in Biochemistry, Pre-Pharmacy Concentration

- **LIFE 201B** Introductory Genetics: Molecular/Immunological/Developmental (GT-SC2)  
  - Critical: X  
  - Credits: 3A  
  - Total Credits: 3

- **LIFE 203** Introductory Genetics Laboratory  
  - Critical: X  
  - Credits: 2

Select one course from the following:

- **MATH 161** Calculus for Physical Scientists II (GT-MA1)  
  - Critical: X  
  - Recommended: 1B  
  - Total Credits: 4

- **MATH 255** Calculus for Biological Scientists II  
  - Critical: X  
  - Recommended: 1B

**Total Credits**: 16

### Sophomore

#### Semester 3

- **CHEM 341** Modern Organic Chemistry I  
  - Critical: X  
  - Recommended: 3C  
  - Credits: 3

- **ECON 202** Principles of Microeconomics (GT-SS1)  
  - Critical: X  
  - Recommended: 3

- **LIFE 210** Introductory Eukaryotic Cell Biology  
  - Critical: X  
  - Recommended: 3

- **LIFE 212** Introductory Cell Biology Laboratory  
  - Critical: X  
  - Recommended: 2

- **SPCM 200** Public Speaking  
  - Critical: X  
  - Recommended: 3

**Total Credits**: 14

#### Semester 4

- **CHEM 343** Modern Organic Chemistry II  
  - Critical: X  
  - Recommended: 3

- **CHEM 344** Modern Organic Chemistry Laboratory  
  - Critical: X  
  - Recommended: 2

Select one course from the following:

- **BMS 300** Principles of Human Physiology  
- **BMS 360** Fundamentals of Physiology

Select one course from the following:

- **PH 121** General Physics I (GT-SC1)  
  - Critical: X  
  - Recommended: 3A

- **PH 141** Physics for Scientists and Engineers I (GT-SC1)  
  - Critical: X  
  - Recommended: 3A

**Total Credits**: 14

### Junior

#### Semester 5

- **BC 401** Comprehensive Biochemistry I  
  - Critical: X  
  - Recommended: 4A  
  - Credits: 3

- **BMS 302** Laboratory in Principles of Physiology  
  - Critical: X  
  - Recommended: 2

Select one course from the following:

- **PH 122** General Physics II (GT-SC1)  
  - Critical: X  
  - Recommended: 3A

- **PH 142** Physics for Scientists and Engineers II (GT-SC1)  
  - Critical: X  
  - Recommended: 3A

Select one course from the following:

- **STAT 301** Introduction to Statistical Methods  

- **STAT 307** Introduction to Biostatistics  

- **STAT 315** Statistics for Engineers and Scientists  

**Foundations and Perspectives**: 3B, 3D, 3E  
- Credits: 3

**Total Credits**: 16

#### Semester 6

- **BC 403** Comprehensive Biochemistry II  
  - Critical: X  
  - Recommended: 4B  
  - Credits: 3

- **BMS 301** Human Gross Anatomy  
  - Critical: X  
  - Recommended: 5

- **MIP 300** General Microbiology  
  - Critical: X  
  - Recommended: 3

- **MIP 302** General Microbiology Laboratory  
  - Critical: X  
  - Recommended: 2

- **Advanced Writing**  
  - Critical: 2  
  - Recommended: 3

**PH 122 or PH 142 must be completed by the end of Semester 6.**  
- Critical: X

**Total Credits**: 16

### Senior

#### Semester 7

- **BC 404** Comprehensive Biochemistry Laboratory  
  - Critical: X  
  - Recommended: 4B  
  - Credits: 2

- **BC 411** Physical Biochemistry  
  - Critical: X  
  - Recommended: 4

- **BC 493** Senior Seminar  
  - Critical: X  
  - Recommended: 4A, 4C

Select one course from the following:

**Total Credits**: 3
Major in Biochemistry, Pre-Pharmacy Concentration

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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</tr>
</thead>
<tbody>
<tr>
<td>BC 463</td>
<td>Molecular Genetics</td>
<td>X</td>
<td>3B, 3D, 3E</td>
</tr>
<tr>
<td></td>
<td>Foundations and Perspectives</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Students that elect to take BC 463 must do so Fall (Semester 7) and plan to take AUCC 3B, 3D, 3E (Foundations and Perspectives) in Spring (Semester 8).

<table>
<thead>
<tr>
<th>Semester 8</th>
<th>Critical</th>
<th>Recommended</th>
<th>AUCC</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Select one course from the following:</td>
<td>X</td>
<td>3</td>
<td></td>
<td></td>
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<tr>
<td>BC 465</td>
<td>Molecular Regulation of Cell Function</td>
<td>X</td>
<td>3B, 3D, 3E</td>
<td></td>
</tr>
<tr>
<td>Foundations and Perspectives</td>
<td>X</td>
<td>3B, 3D, 3E</td>
<td></td>
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</table>

Select one course from the following: 3

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC 499A</td>
<td>Thesis: Laboratory Research-Based</td>
<td>4C</td>
</tr>
<tr>
<td>BC 499D</td>
<td>Thesis: Literature-based in Pre-Pharmacy</td>
<td>4C</td>
</tr>
</tbody>
</table>

Foundations and Perspectives

| Elective | X | 3 |

Students that elect to take BC 465 must do so Spring (Semester 8) and plan to take AUCC 3B, 3D, 3E (Foundations and Perspectives) in Fall (Semester 7).

The benchmark courses for the 8th semester are the remaining courses in the entire program of study.

<table>
<thead>
<tr>
<th>Total Credits</th>
<th>15</th>
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Program Total Credits: 120