MAJOR IN BIOCHEMISTRY, PRE-PHARMACY CONCENTRATION

This concentration augments the ASBMB Concentration with additional coursework in physiology, microbiology, immunology, economics 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 2022

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.

If students successfully complete an additional 1-credit course, Responsible Conduct in Biochemical Research BC 360, they can state on their resume that they graduated from an “American Society for Biochemistry and Molecular Biology (ASBMB) accredited program.” Further, students also have the option of taking a 1-hour ASBMB exam during the spring semester of their senior year. Student who pass the exam will additionally receive degree certification from ASBMB.

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>AUCC</th>
<th>Credits</th>
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<td>CHEM 111</td>
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<td>College Composition (GT-CO2)</td>
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<td>MATH 155</td>
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<td>MATH 255</td>
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<td>Group B:</td>
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<td>MATH 161</td>
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<td>Modern Organic Chemistry I</td>
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<td>CHEM 343</td>
<td>Modern Organic Chemistry II</td>
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<td>CHEM 344</td>
<td>Modern Organic Chemistry Laboratory</td>
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<td>ECON 202</td>
<td>Principles of Microeconomics (GT-SS1)</td>
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<td>LIFE 210</td>
<td>Introductory Eukaryotic Cell Biology</td>
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<td>Fundamentals of Physiology</td>
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<td>PH 121</td>
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<td></td>
<td>PH 141</td>
<td>Physics for Scientists and Engineers I (GT-SC1)</td>
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<td>BC 401</td>
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Major in Biochemistry, Pre-Pharmacy Concentration

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<td>BC 403</td>
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<td>BMS 301</td>
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<td>BMS 302</td>
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<td>MIP 300</td>
<td>General Microbiology</td>
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<td>MIP 302</td>
<td>General Microbiology Laboratory</td>
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<td>PH 122</td>
<td>General Physics II (GT-SC1)</td>
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<tr>
<td>PH 142</td>
<td>Physics for Scientists and Engineers II (GT-SC1)</td>
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<td>STAT 301</td>
<td>Introduction to Applied Statistical Methods</td>
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<td>Introduction to Biostatistics</td>
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<td>STAT 315</td>
<td>Intro to Theory and Practice of Statistics</td>
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Select one course from the following:

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<thead>
<tr>
<th>Course</th>
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<tr>
<td>BC 404</td>
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<td>BC 493</td>
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<td>BC 463</td>
<td>Molecular Genetics</td>
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<td>Molecular Regulation of Cell Function</td>
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Select one course from the following:

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<thead>
<tr>
<th>Course</th>
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<td>BC 499A</td>
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<td>BC 499D</td>
<td>Thesis: Literature-based in Pre-Pharmacy</td>
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Foundations and Perspectives ([link](http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#foundations-perspectives))

Total Credits: 32

Senior

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<td>BC 411</td>
<td>Physical Biochemistry</td>
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<td>Senior Seminar</td>
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Select one course from the following:

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<tr>
<td>BC 463</td>
<td>Molecular Genetics</td>
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<td>BC 465</td>
<td>Molecular Regulation of Cell Function</td>
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Select one course from the following:

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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BC 499A</td>
<td>Thesis: Laboratory Research-Based</td>
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<tr>
<td>BC 499D</td>
<td>Thesis: Literature-based in Pre-Pharmacy</td>
<td>4C</td>
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Foundations and Perspectives ([link](http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#foundations-perspectives))

Electives

Total Credits: 29

<table>
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<th>Course</th>
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</table>

Program Total Credits: 120

1 Select from the list of courses in categories 3B, 3D (six credits [two courses] must come from 3B; one course from category 3D) 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:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Critical</th>
<th>Recommended</th>
<th>AUCC</th>
<th>Credits</th>
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</tr>
<tr>
<td></td>
<td>LIFE 102</td>
<td></td>
<td></td>
<td>3A</td>
<td>4</td>
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</table>

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).

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.
Select one course from the following:

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>MATH 155</td>
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<td>Calculus for Biological Scientists I (GT-MA1)</td>
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<td>MATH 160</td>
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<tr>
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**Total Credits:** 15

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<td>CHEM 114</td>
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<td>X</td>
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<td>CO 150</td>
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<td>1A</td>
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<td>3A</td>
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<td>Select one course from the following:</td>
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**Total Credits:** 16

**Sophomore**

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<td>ECON 202</td>
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<td>3C</td>
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<td>LIFE 210</td>
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<td>LIFE 212</td>
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**Total Credits:** 14

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<td>CHEM 344</td>
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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) X 3A
- PH 141 Physics for Scientists and Engineers I (GT-SC1) X 3A

**Total Credits:** 14

**Junior**

<table>
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Select one course from the following:

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

Select one course from the following:

- STAT 301 Introduction to Applied Statistical Methods
- STAT 307 Introduction to Biostatistics
- STAT 315 Intro to Theory and Practice of Statistics
- Diversity, Equity, and Inclusion (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-equity-inclusion) 1C 3

**Total Credits:** 16

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### Advanced Writing (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#advanced-writing)

PH 122 or PH 142 must be completed by the end of Semester 6. X

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#### Senior

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<td>BC 411</td>
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Select one course from the following:

- BC 463 Molecular Genetics X
- Foundations and Perspectives (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#foundations-perspectives) 3B, 3D

**Electives**

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

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<th>Credits</th>
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<td>Select one course from the following:</td>
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<td>BC 465 Molecular Regulation of Cell Function</td>
<td>X</td>
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<td>Foundations and Perspectives (<a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#foundations-perspectives">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#foundations-perspectives</a>)</td>
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<td>3B, 3D</td>
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Select one course from the following:

- BC 499A Thesis: Laboratory Research-Based X
- BC 499D Thesis: Literature-based in Pre-Pharmacy X

Foundations and Perspectives (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#foundations-perspectives) X 3B, 3D

**Elective**

Students that elect to take BC 465 must do so Spring (Semester 8) and plan to take AUCC 3B, 3D (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>
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<tr>
<th>Total Credits</th>
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| Program Total Credits: | 120 |