

## American Chemical Society-Certified Biochemistry Concentration

This program leads to a B.S. degree and is designed for the student who wishes to pursue a career as a professional chemist in the area of biochemistry and the biological sciences.

Below is a suggested schedule of courses. This information is provided as a guide and does not supersede information provided by advisors or the Undergraduate Catalog. Each student will develop a specific course schedule in consultation with their departmental advisor. For details of all the University, College and Departmental requirements for graduation, students should consult the Catalog.

**75 hours** is required (not including Foundational Studies requirements). (F, S and Sum indicate that this course is usually offered in Fall, Spring and Summer semesters.)

### Freshman Year:

CHEM 105 (General Chem I; 3 hr; F, S and Sum)  
CHEM 105L (General Chem I Lab; 1 hr; F, S and Sum)  
CHEM 106 (General Chem II; 3 hr; S and Sum)  
CHEM 106L (General Chem II Lab; 1 hr; S and Sum)  
BIO 101 (Principles of Biology I; 3 hr; F and Sum)  
BIO 101L (Principles of Biology I Lab; 1 hr; F and Sum)  
BIO 102 (Principles of Biology II; 3 hr; S)  
BIO 102L (Principles of Biology II Lab; 1 hr; S)  
MATH 131 (Calculus I; 4 hr; F, S and Sum)  
MATH 132 (Calculus II; 4 hr; F, S, and Sum)

### Sophomore Year:

CHEM 321 (Analytical Chem I; 3 hr; S)  
CHEM 321L (Analytical Chem I Lab; 1 hr; S)  
CHEM 351 (Organic Chem I; 3 hr; F and Sum)  
CHEM 351L (Organic Chem I Lab; 1 hr; F and Sum)  
CHEM 352 (Organic Chem II; 3 hr; S and Sum)  
CHEM 352L (Organic Chem II Lab; 1 hr; S and Sum)  
PHYS 115 (University Phys I; 4 hr; F)  
PHYS 115L (University Phys I Lab; 1 hr; F)  
PHYS 116 (University Phys II; 4 hr; S)  
PHYS 116L (University Phys II Lab; 1 hr; S)

### Junior Year:

CHEM 341 (Inorganic Chemistry; 3 hr; S)  
CHEM 355 – or Senior year - (Organic Chem Lab Techniques; 2 hr; S; *offered alternate years*)  
CHEM 431 (Biochemistry I, 3 hr; F)  
CHEM 431L (Biochemistry I Lab; 1 hr; F)  
CHEM 432 (Biochemistry II; 3 hr; S)  
CHEM 461 (Physical Chem I; 4 hr; F)  
CHEM 461L (Physical Chem I Lab; 1 hr; F)  
One from: BIO 330/330L (General Physiology; S); BIO 374/374L (Cellular and Microbial Biology; S);  
BIO 380/380L (Genetics; F)

### Senior Year:

CHEM 405 (Senior Seminar in Chemistry; 1 hr; F)  
One from: BIO 330/330L (General Physiology; S); BIO 374/374L (Cellular and Microbial Biology; S);  
BIO 380/380L (Genetics; F)

**Advanced Electives** (3 hr required): Choose approved advanced courses in chemistry. CHEM 300, 340, 421/L, 462/L, 495, 499, and other courses offered on alternate years will count. (See class schedule or consult your advisor to determine when these courses will be offered.) CHEM 495 (Internship in Chemistry) or 499 (Introduction to Research) can be taken for variable credit. CHEM 330 and 399 cannot be used as advanced electives.

### ACS-Certified Biochemistry Concentration Curriculum

The degree courses are in boldface. The plan below is only a suggested sequence, but courses must be taken with observance of prerequisites. Prerequisites are indicated in brackets.

	Fall	Spring
Freshman	<b>CHEM 105</b> <i>[see catalog for</i> <b>3</b> <b>CHEM 105L</b> <i>math recommend.]</i> <b>1</b> <b>BIO 101</b> <b>3</b> <b>BIO 101L</b> <b>1</b> <b>MATH 131</b> <sup>1</sup> <i>[Maple score of 21 or</i> <b>4</b> <i>MATH 112 and 115]</i> English course <sup>1</sup> <b>3</b> 15	<b>CHEM 106</b> <i>[CHEM 105/L]</i> <b>3</b> <b>CHEM 106L</b> <b>1</b> <b>BIO 102</b> <i>[CHEM 105]</i> <b>3</b> <b>BIO 102L</b> <b>1</b> <b>MATH 132</b> <i>[MATH 131]</i> <b>4</b> COMM 101 <b>3</b> 15
Sophomore	<b>CHEM 351</b> <i>[CHEM 105/L]</i> <b>3</b> <b>CHEM 351L</b> <b>1</b> <b>PHYS 115</b> <i>[MATH 131]</i> <b>4</b> <b>PHYS 115L</b> <b>1</b> Found. Stud. courses (2) <b>6</b> 15	<b>CHEM 352</b> <i>[CHEM 351]</i> <b>3</b> <b>CHEM 352L</b> <i>[CHEM 351L]</i> <b>1</b> <b>PHYS 116</b> <i>[PHYS 115, MATH 132]</i> <b>4</b> <b>PHYS 116L</b> <b>1</b> <b>CHEM 321</b> <i>[CHEM 106/L]</i> <b>3</b> <b>CHEM 321L</b> <b>1</b> Found. Stud. course <b>3</b> 16
Junior	<b>CHEM 461</b> <i>[CHEM 321/L; MATH 132;</i> <b>4</b> <i>PHYS 106/L or 116/L]</i> <b>CHEM 461L</b> <b>1</b> <b>CHEM 431</b> <i>[CHEM 352]</i> <b>3</b> <b>CHEM 431L</b> <i>[CHEM 352]</i> <b>1</b> ENG 305T <b>3</b> Found. Stud. course <b>3</b> 15	<b>CHEM 341</b> <i>[CHEM 352]</i> <b>3</b> <b>CHEM 432</b> <i>[CHEM 431]</i> <b>3</b> <b>BIO 330/L, 374/L, or 380/L</b> <sup>2</sup> <b>4</b> <b>CHEM 355</b> <i>[CHEM 352/L]</i> <b>2</b> <i>(offered alternate years)</i> Found. Stud. course <b>3</b> 15
Senior	<b>CHEM 405</b> <b>1</b> <b>BIO 330/L, 374/L, or 380/L</b> <sup>2</sup> <b>4</b> <b>Advanced elective</b> <sup>3</sup> <b>3</b> Found. Stud. courses (2) <b>6</b> 14	Found. Stud. courses (4) <b>12</b> General elective <sup>1</sup> <b>3</b> 15

*[Prerequisite]*      *[Pre- or Co-requisite]*

1. Specific requirements are determined by proficiencies met upon entering. You may need to start with a lower-level math course before MATH 131 (Calculus I), but calculus should be started in your first semester if you place into it. You may need to add a basic skills course. You may need one semester of English (107) or two (101 & 105). You may or may not need to take language courses as part of the Foundational Studies curriculum. Additional courses reduce the number of “general elective” courses later in the curriculum. One Foundational Studies UDIE course may be replaced by completion of a minor, second major, or certificate. A Biology minor can be completed by taking *all* of the five Biology courses listed above, and BIO 350/350L. Completion of the Honors Program may reduce the number of Foundational Studies courses required. Completion of 120 total credits is a University requirement.

2. Check catalog for biology prerequisites. BIO 380 is normally offered in the Fall; 330 and 374 in the Spring.

3. A total of 3 credits advanced chemistry electives is required.