

# B.S. IN BIOLOGY - CELL AND MOLECULAR CONCENTRATION

College of the Sciences and Mathematics

## Curriculum

Code	Title	Credits
<b>GENERAL EDUCATION REQUIREMENTS</b> ( <a href="http://catalog.wcupa.edu/undergraduate/general-education-requirements/">http://catalog.wcupa.edu/undergraduate/general-education-requirements/</a> )		
<b>Academic Foundations</b>		
First Year Experience requirement		4
English Composition requirement		6-7
Mathematics requirement		3-4
MAT 121	Introduction to Statistics I	
or MAT 125	Introduction to Statistics and Probability	
Interdisciplinary requirement		3
Diverse Communities requirement		3
Ethics requirement		3
<b>Distributed Disciplinary Foundations</b>		
Science requirement		6-8
CHE 103	General Chemistry I	
PHY 130	General Physics I	
Behavioral & Social Science requirement		6
Humanities requirement		6
Arts requirement		3
<b>ADDITIONAL BACCALAUREATE REQUIREMENTS</b> ( <a href="http://catalog.wcupa.edu/undergraduate/general-education-requirements/">http://catalog.wcupa.edu/undergraduate/general-education-requirements/</a> )		
<b>University Requirements</b>		
Writing Emphasis requirement		9
Speaking Emphasis requirement		9
<b>Degree Requirements</b>		
Capstone requirement		1-15
<b>MAJOR REQUIREMENTS</b>		
<b>Core Courses</b>		
BIO 110	General Biology I <sup>1</sup>	4
BIO 111	General Biology II <sup>1</sup>	4
BIO 210	Genetics <sup>1</sup>	3
BIO 210L	Genetics Lab <sup>1</sup>	1
BIO 211	Cell Biology <sup>1</sup>	4
CHE 103	General Chemistry I	3
CRL 103	General Chemistry I Lab	1
CHE 104	General Chemistry II	3
CRL 104	General Chemistry II Lab	1
CHE 231	Organic Chemistry I	4
CRL 231	Organic Chemistry I Lab	2
CHE 232	Organic Chemistry II	3
PHY 130	General Physics I <sup>2</sup>	4
or PHY 170	Physics I	
PHY 140	General Physics II <sup>2</sup>	4
or PHY 180	Physics II	
MAT 121	Introduction to Statistics I	3
or MAT 125	Introduction to Statistics and Probability	
Select one semester of calculus		3-4
<b>Other Required Courses</b>		
BIO 214	General Microbiology <sup>1</sup>	4

BIO 421	Cellular and Molecular Biology <sup>1</sup>	4
BIO 431	Molecular Genetics	3
BIO 333	Molecular Biology Techniques	2
CHE 476	Biochemistry I	3

### Biology or Chemistry Electives <sup>3</sup>

Select 10 semester hours from courses at or above the 300 level

### Capstone Requirement

Select one of the following: <sup>1</sup>

BIO 490	Capstone: Seminar in Biology <sup>4</sup>	3
BIO 491	Capstone: Independent Research in Biology <sup>4,5</sup>	
BIO 492	Capstone: Professional Development in Biology <sup>4,5</sup>	

**Total Minimum Credits Required** **120**

<sup>1</sup> Courses must be passed with a grade of C- (70%) or better.

<sup>2</sup> The recommended Physics sequence is PHY 130 & PHY 140. Students may substitute the PHY 170 & PHY 180 sequence, but PHY 130 may not be used as a prerequisite for PHY 180 and PHY 170 may not be used as a prerequisite for PHY 140.

<sup>3</sup> Selected from Biology or Chemistry courses at or above the 300 level, except BIO 469.

<sup>4</sup> This course fulfills the Capstone requirement.

<sup>5</sup> A maximum of 8 combined credits from BIO 491 and BIO 492 may be applied to the total BIO program credits.

## Sample Course Plan

To track their individual degree progress, students are advised to access their Degree Progress Report (DPR) via myWCU regularly. For more information, visit [wcupa.edu/DegreeProgressReport](http://wcupa.edu/DegreeProgressReport) (<http://wcupa.edu/degreeprogressreport/>).

The following is a sample suggested course sequence for this program; course offerings and availability are not guaranteed. Students should consult their academic advisor with any questions.

Course	Title	Credits
<b>Year One</b>		
<b>Semester One</b>		
BIO 110	General Biology I	4
CHE 103	General Chemistry I	4
& CRL 103	and General Chemistry I Lab	
WRT 120	Effective Writing I	3
FYE 100X	First Year Experience	4
<b>Credits</b>		<b>15</b>
<b>Semester Two</b>		
BIO 111	General Biology II	4
CHE 104	General Chemistry II	4
& CRL 104	and General Chemistry II Lab	
MAT 121	Introduction to Statistics I <sup>1</sup>	3
or	or Introduction to Statistics and	
MAT 125	Probability	
WRT 2XX	200-Level WRT Course	3
Behavioral & Social Science Gen Ed		3
<b>Credits</b>		<b>17</b>
<b>Year Two</b>		
<b>Semester Three</b>		
BIO 210	Genetics	4
& 210L	and Genetics Lab <sup>2</sup>	
CHE 231	Organic Chemistry I	6
& CRL 231	and Organic Chemistry I Lab	

Humanities & Ethics Gen Ed		3
Arts Gen Ed		3
<b>Credits</b>		<b>16</b>
<b>Semester Four</b>		
BIO 211	Cell Biology <sup>2</sup>	4
BIO 214	General Microbiology <sup>2</sup>	4
CHE 232	Organic Chemistry II <sup>3</sup>	3
MAT 145	Calculus for the Life Sciences	3-4
or	or Brief Calculus	
MAT 143	or Calculus I	
or		
MAT 161		
Behavioral & Social Science Gen Ed		3
<b>Credits</b>		<b>17-18</b>
<b>Year Three</b>		
<b>Semester Five</b>		
BIO 333	Molecular Biology Techniques	2
PHY 130	General Physics I	4
Diverse Communities Gen Ed		3
Directed Elective		3
Directive Elective		3
<b>Credits</b>		<b>15</b>
<b>Semester Six</b>		
CHE 476	Biochemistry I	3
PHY 140	General Physics II	4
BIO/CHE XXX	Biology or Chemistry Elective	3
Interdisciplinary Gen Ed		3
Speaking Emphasis Gen Ed		3
<b>Credits</b>		<b>16</b>
<b>Year Four</b>		
<b>Semester Seven</b>		
BIO 431	Molecular Genetics	3
BIO/CHE XXX	Biology or Chemistry Elective	3
BIO/CHE XXX	Biology or Chemistry Elective	3
Humanities Gen Ed		3
Upper-Level Directed Elective		3
<b>Credits</b>		<b>15</b>
<b>Semester Eight</b>		
BIO 421	Cellular and Molecular Biology	4
BIO 490	Capstone: Seminar in Biology	3
or	or Capstone: Independent Research in	
BIO 491	Biology	
or	or Capstone: Professional Development	
BIO 492	in Biology	
BIO/CHE XXX	Biology or Chemistry Elective	3
<b>Credits</b>		<b>10</b>
<b>Total Credits</b>		<b>121-122</b>

<sup>1</sup> Students should take statistics (MAT 121 or MAT 125) in the first year.

<sup>2</sup> All required 200-level biology courses should be completed by the end of Semester #5.

<sup>3</sup> CRL 232 is recommended but not required for any student considering professional training. It is required for graduate training following completion of their degree.