

B. S. IN BIOLOGY: CELL AND MOLECULAR CONCENTRATION

Fall 2020– Spring 2021

I. ACADEMIC FOUNDATIONS & DEGREE REQUIREMENTS

<i>Requirement</i>	<i>Course</i>	<i>Credits</i>	<i>Term</i>	<i>Year</i>	<i>Grade</i>
First Year Experience	FYE 100	4	_____	_____	_____
Effective Writing I	WRT 120	3	_____	_____	_____
Effective Writing II	WRT 2__ [▲]	3	_____	_____	_____
Mathematics: Statistics	MAT 121 ⁺ or 125 ⁺	3	_____	_____	_____
Interdisciplinary (“I”)	_____	3	_____	_____	_____
Diverse Communities (“J”)	_____♥	3	_____	_____	_____
Ethics (“ET”)	_____♥	3	_____	_____	_____

Writing Emphasis (“W”) *Nine credits**, integrated across General Education & Major courses.

_____ BIO 220 _____

One at 300/400-level: _____

Speaking Emphasis (“SE”) *Nine credits**, integrated across General Education & Major courses.

One at 300/400-level: _____

II. GENERAL EDUCATION DISTRIBUTIVE REQUIREMENTS

- *Courses must be selected from the approved General Education list (see the [catalog](#)).*
- *Interdisciplinary (“I”) courses cannot also be a General Education distributive course.*
- *Biology majors fulfill their science requirements with CHE 103 and PHY 130/170.*
- *Distributive requirements can be simultaneously satisfied with other degree requirements, see some examples♦.*

A. Humanities (6 credits): E.g., Literature (LIT/CLS), History (HIS), Philosophy (PHI)

Courses must be selected from two different subject areas.

_____ 3 _____
 _____ 3 _____

B. Behavioral and Social Sciences (6 credits): E.g., Psychology (PSY), Sociology (SOC), Anthropology (ANT), Political Science (PSC), Geography (GEO), Economics (ECO)

Courses must be selected from two different subject areas.

Note: Students taking the MCAT should take PSY 100 and SOC 100.

_____ 3 _____
 _____ 3 _____

C. Arts (3 credits): E.g., Art (ART), Art History (ARH), Dance (DAN), Film (FLM), Music (MHL, MTC), Theater (THA)

_____ 3 _____

III. DIRECTED ELECTIVES – 13-14 credits (as many as needed to reach 120 total credits)

_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

IV. SUPPORTING COURSES (31-32 credits)

Calculus **	MAT	3	_____	_____	_____
General Chemistry I	CHE 103	3	_____	_____	_____
General Chemistry I Lab	CRL 103	1	_____	_____	_____
General Chemistry II	CHE 104	3	_____	_____	_____
General Chemistry II Lab	CRL 104	1	_____	_____	_____
Organic Chemistry I	CHE 231	4	_____	_____	_____
Organic Chemistry I Lab	CRL 231	2	_____	_____	_____
Organic Chemistry II	CHE 232	3	_____	_____	_____
Biochemistry I	CHE 476	3	_____	_____	_____
General Physics I **	PHY 130	4	_____	_____	_____
General Physics II	PHY 140	4	_____	_____	_____

V. BIOLOGY COURSES (42 credits) -- GPA must be 2.0 or higher to graduate.

A. Required courses (28 credits)

General Biology ***	BIO 110	3	_____	_____	_____
General Microbiology ***	BIO 214	4	_____	_____	_____
Botany or Zoology ***	BIO 215/217	3	_____	_____	_____
Cell Physiology ***	BIO 220	3	_____	_____	_____
Genetics ***	BIO 230	3	_____	_____	_____
Molec. Biol. Techniques	BIO 333	2	_____	_____	_____
Cellular and Molecular ***	BIO 421	4	_____	_____	_____
Molecular Genetics	BIO 431	3	_____	_____	_____
Seminar or Internship or Independent Study or CHE 491*** ^Δ	BIO 490/409/491	3	_____	_____	_____

B. Biology or Chemistry electives (14 credits)

Select 14 semester hours from courses in BIO or CHE at or above the 300 level (except BIO 307 and 469). Courses should be chosen in consultation with the student's advisor.

_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Notes and Requirements

Total degree program: 120 credits.

♠ The second (200-level) WRT course is chosen from WRT 200, 204, 205, 206, 208, or 220.

♥ The Diverse Communities (“J”) course and the Ethics (“ET”) courses can be satisfied through another requirement (e.g., Interdisciplinary or Distributive) as long as the course carries the appropriate attribute(s). *Note:* Credits are not duplicated such that if a course satisfies two requirements, those credits must be made up via directed electives (the minimum total credits for a B.S. degree is 120).

♣ All students must take at least 9 credits of Writing Emphasis courses and 9 credits of Speaking Emphasis courses. Students who enter WCU with 40-70 transfer credits only need 6 credits of each; students who enter with >70 transfer credits only need 3 credits of each. **All students must take at least 3 credits of Writing Emphasis and 3 credits of Speaking Emphasis at the 300-400 level.**

♦ Students should think about how requirements can be simultaneously satisfied. As examples: LNC 110 is a Humanities distributive that satisfies the Ethics requirement; PHI 180 is a Humanities distributive that satisfies the Diverse Communities & Ethics requirements; LIT 165 is a Humanities distributive that is also Writing Emphasis; PSC 101 is a Behavioral & Social Science distributive that satisfies the Diverse Communities requirement.

+ All student will need to complete the Math Placement Exam before they can enroll in MAT courses. For information, please visit the link below. Please direct any questions to mathexam@wcupa.edu.
<https://www.wcupa.edu/sciences-mathematics/mathematics/mathematicsPlacement.aspx>

* The Biology department recommends MAT 145 (Calculus for the Life Sciences; 3 credits) or MAT 161 (Calculus I; 4 credits). MAT 143 (Brief Calculus; 3 credits) is also acceptable. You must meet the necessary pre-requisites or obtain a minimum score on the Math Placement Exam to enroll in a calculus class. Visit the Math Department website to take the exam. If you receive a score of 3 or lower on the placement exam, you must take MAT 115 (Algebra, Functions, and Trigonometry) or MAT 131 (Precalculus) as preparation for Calculus (MAT 143 or MAT 145). If a student scores a 2 or lower, they will need to take MAT Q30 before they can enroll in MAT 115 or MAT 131. Students can repeat the mathematics assessment to improve their score. If you receive a score of 4 or above, you can enroll directly into MAT 143 or MAT 145. You must score a 5 to enroll into MAT 161 or take the pre-requisite of MAT 131.

** 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.

*** Course must be passed with a "C-" or better.

△ Students using BIO 409 to fill this requirement must be aware that using three credits in a required Biology course (section V - A) will not also count as three credits towards a Biology elective (section V - B). Check with your academic advisor if you are unsure of credit usage. Students who take CHE 491 instead of BIO 490/491/ 409 must take 14 credits of upper level CHE or BIO courses. A maximum of 8 combined credits from BIO 409 & 491 may be applied to the total BIO elective credits.

Suggested Sequence for B.S. Biology Majors Cell & Molecular Concentration

Fall 2020– Spring 2021

____ ____ ____ ____ ____	Semester #1 (17 credits)	____ ____ ____ ____ ____	Semester #2 (16 credits)
	FYE 100 (4) WRT 120 (3) BIO 110 (3) CHE 103/CRL 103 (3)/(1) MAT 121 or MAT 125 (3)		WRT 2__ (3) BIO 215 or 217 (3) CHE 104/CRL 104 (3)/(1) MAT 145 (3) or MAT 143/161 Gen Ed Distributive: Behavioral & Social Science (3)
____ ____ ____ ____	Semester #3 (16 credits)	____ ____ ____ ____	Semester #4 (12 credits)
	CHE 231/CRL 231 (4)/(2) BIO 214 (4) Gen Ed Distributive: Humanities & Ethics (ET) course (3) Gen Ed Distributive: Arts (3)		BIO 230 (3) BIO 220 (3) (W) CHE 232 (3) Gen Ed Distributive: Behavioral & Social Science (3)
____ ____ ____ ____ ____	Semester #5 (15 credits)	____ ____ ____ ____ ____	Semester #6 (16 credits)
	BIO 333 (2) PHY 130 (4) Diversity (J) Course (3) Directed Elective (3) Directed Elective (3)		CHE 476 (3) PHY 140 (4) Interdisciplinary (I) Course (3) Directed Elective (3) BIO/CHE Elective (3)
____ ____ ____ ____ ____	Semester #7 (15 credits)	____ ____ ____ ____ ____	Semester #8 (16 credits)
	BIO 431 (3) BIO/CHE Elective (3) BIO/CHE Elective (3) Directed Elective (3) Gen Ed Distributive: Humanities (3)		BIO 421 (4) BIO/CHE Elective (3) BIO/CHE Elective (3) Directed Elective (3) (if needed) BIO 490/409/491 (3)

All required 200 level Biology courses should be completed by the end of Semester #5.

Students should take Statistics (MAT 121 or 125) in the first year.

CRL 232 is strongly recommended for any student considering Professional or Graduate training following completion of their degree.

All students must take at least 9 credits of Writing Emphasis courses and 9 credits of Speaking Emphasis courses. Students who enter WCU with 40-70 transfer credits only need 6 credits of each; students who enter with >70 transfer credits only need 3 credits of each. **All students must take at least 3 credits of Writing Emphasis and 3 credits of Speaking Emphasis at the 300-400 level.**