

**UNDERGRADUATE MAJOR: *B.S. Biology: Biotechnology Concentration***  
**2021/22**

**CREDITS REQUIRED IN MAJOR: 72**

A grade of C- or higher is required for all courses listed below. All of the following are required. Students may substitute Problems in Biology (BIO 441) or Internship (BIO 443) for one upper level laboratory course.

**FOUNDATION/REQUIRED MAJOR COURSES**

<b>COURSE NUMBER</b>	<b>COURSE NAME</b>	<b>CREDITS</b>	<b>PREREQUISITES</b>	<b>OFFERED</b>	<b>Online</b>
BIO 105	Biological Principles I: Cellular Biology	3	Grade of C or higher in any 100-level or higher MAT course, or appropriate placement test score.	Fall, Spring, Summer	
BIO 106	Biological Principles I Laboratory	1.5	BIO 105 with a minimum grade of C- or concurrent enrollment	Fall, Spring, Summer	
BIO 107	Biological Principles II: Evolution, Biodiversity, and Ecology	4.5	Grades of C- or higher in BIO 105 and BIO 106.	Fall, Spring	
BIO 201	Genetics	3	Grade of C- or higher in BIO 105 or BIO 111, or permission of instructor.	Fall	
BIO 311	Microbiology	3	CHY 115 and grade of C- or higher in BIO 107 or BIO 113; or permission of instructor.	Spring	
BIO 282	Microbiology Laboratory	2	Grade of C- or higher or concurrent enrollment in BIO 281 or BIO 311; or permission of instructor.	Spring	
BIO 413	Applied Biostatistics	3	Grade of C- or higher in MAT 220 or permission of instructor.	Fall	
BIO 423	Topics in Genetics	3	Grade of C- or higher in BIO 201 or concurrent, or permission of instructor	Spring	
BIO 431	Principles of Immunology	3	CHY 107 or CHY 115, junior standing, and grade of C- or higher in either BIO 107 or BIO 113; or permission of instructor.	Fall	

BIO 432	Principles of Immunology Laboratory	2	Grade of C- or higher or concurrent enrollment in BIO 431, or permission of instructor.	Fall	
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**SELECT One pair of courses from the following combinations:**

COURSE NUMBER	COURSE NAME	CREDITS	PREREQUISITES	OFFERED	Online
<b>1</b>					
BIO 409	Cell and Molecular Biology	3	CHY 115 and either grade of C- or higher in BIO 201 or concurrent enrollment in BIO 201.	Spring	
BIO 410	Cell and Molecular Biology Laboratory	2	BIO 409 or concurrently.	Spring	
<b>2</b>					
CHY 461	Biochemistry	3	Grade of C or better in CHY 253 or by instructor permission	Fall	
CHY 462	Biochemistry Laboratory	2	Grade of C or better in CHY 254; CHY 461 or concurrent	Fall	
<b>3</b>					
CHY 461	Biochemistry	3	Grade of C or better in CHY 253 or by instructor permission	Fall	
CHY 463	Biochemistry II	3	Grade of C or better in CHY 461	Spring	

**NON MAJOR REQUIREMENTS: 37 CREDITS**

COURSE NUMBER	COURSE NAME	CREDITS	PREREQUISITES	OFFERED	Online

MAT 152	Calculus A	4	MAT 140 or appropriate placement test score.	Fall, Spring, Summer	Yes
MAT 220	Statistics for the Biological Sciences	4	MAT 152	Fall, Spring, Summer	Yes
CHY 113	Principles of Chemistry I	3	Pre- or co-requisite: MAT 108 (or concurrent) or MAT 140 (placement or concurrent) or MAT 152 (placement or concurrent) or permission.	Fall, Spring	
CHY 114	Laboratory Techniques I	1.5	CHY 113 (or concurrent)	Fall, Spring	
CHY 115	Principles of Chemistry II	3	Grade of C or better in CHY 113	Spring, Summer	
CHY 116	Laboratory Techniques II	1.5	Grade of C or better in CHY 114; CHY 115 (or concurrent)	Spring, Summer	
CHY 251	Organic Chemistry I	3	Grade of C or better in CHY 115	Fall, Summer	
CHY 252	Organic Chemistry Laboratory	2	Grade of C or better in CHY 116; CHY 251 (or concurrent)	Fall, Summer	
CHY 253	Organic Chemistry II	3	Grade of C or better in CHY 251	Spring, Summer	
CHY 254	Organic Chemistry Laboratory II	2	Grade of C or better in CHY 252; CHY 253 or concurrent	Spring, Summer	

**SELECT One of the following two sequences:**

**Sequence 1:**

COURSE NUMBER	COURSE NAME	CREDITS	PREREQUISITES	OFFERED	Online
PHY 111	Elements of Physics I	4	Grade of C or higher, or concurrent enrollment in MAT 108 or MAT 140 or MAT 152, or permission of instructor.	Fall, Summer	
PHY 114	Introductory Physics Laboratory I	1	Co-requisite: PHY 111 or PHY 121	Fall, Summer	
PHY 112	Elements of Physics II	4	PHY 111 or equivalent. Co-requisite: PHY 116.	Spring, Summer	

PHY 116	Elements of Physics II Laboratory	1	Co-requisite: PHY 112 or 123.	Spring, Summer	
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**Sequence 2:**

COURSE NUMBER	COURSE NAME	CREDITS	PREREQUISITES	OFFERED	Online
PHY 121	General Physics I	4	Prior completion of MAT 152 (highly recommended) or concurrent registration in MAT 152, or equivalent.	Fall, Spring, Summer	
PHY 114	Introductory Physics Laboratory I	1	Co-requisite: PHY 121	Fall, Spring, Summer	
PHY 123	General Physics II	4	PHY 121 or equivalent and one semester of calculus. Co-requisite: PHY 116	Fall, Spring, Summer	
PHY 116	Introductory Physics Laboratory II	1	Co-requisite: PHY 112 or PHY 123	Fall, Spring, Summer	

**MAJOR ELECTIVES: 3-5 CREDITS**

In addition to those requirements, biotechnology students are required to take one additional BIO course with prefix number 200 or higher, which cannot also count as the capstone.

**CAPSTONE: 2-3 CREDITS**

Students must fulfill the University Core curriculum requirements, including a Capstone course in the major.

**MAJOR COURSES OVERLAPPING IN THE CORE:**

CORE AREA	COURSE NUMBER	COURSE NAME	REQUIRED BY MAJOR?
SE	BIO 107	Biological Principles II: Evolution, Biodiversity, Ecology	Yes
QR	MAT 152	Calculus A	Yes
SE	PHY 121	General Physics I	Must select either PHY 121 or PHY 111
SE	PHY 111	Elements of Physics	Must select either PHY 121 or PHY 111

SE	PHY 114	Introductory Physics Laboratory I	Yes (co-requisite with PHY 121 or PHY 111)
SE	CHY 113 CHY 114	Principles of Chemistry I Laboratory Techniques I	Yes
EL	BIO 441	Problems in Biology	No
EL	BIO 442	Honors Thesis in Biology	No
EL	BIO 443	Internship	No
EL	CHY 113	Principles of Chemistry I	Yes
EL	CHY 252	Organic Chemistry Lab I	Yes
CAP	BIO ____	Varies	Yes (see biology department)

**CORE CURRICULUM CODES**

**WRI 1** – Writing, Reading, & Inquiry 1 (ENG 100)

**WRI 2** – Writing, Reading, & Inquiry 2 (ENG 102)

**WRI 3** – Writing, Reading, & Inquiry 3 (SOC 210)

**QR** – Quantitative Reasoning

**CE** – Creative Expression

**SCA** – Socio-cultural Analysis

**CI** – Cultural Interpretation

**SE** – Science Exploration

**EISRC** – Ethical Inquiry, Social Responsibility, & Citizenship

**DIV** – Diversity

**INT** – International

**EL** – Engaged Learning

**CAP** – Capstone