

BIOLOGY MAJOR WITH BIOTECHNOLOGY OPTION, BACHELOR OF SCIENCE (BS)

Graduation Requirements: complete the Educational Testing Service (ETS) Major Field Test for Biology. See Pre-Professional Programs (<http://catalog.ewu.edu/stem/biology/#pretext>) for additional information.

Grade Requirements: a cumulative GPA ≥ 2.0 for all courses in student's curriculum in Biology.

Required Biology Courses

BIOL 171	BIOLOGY I	5
BIOL 172	BIOLOGY II	5
BIOL 173	BIOLOGY III	5
BIOL 270	BIOLOGICAL INVESTIGATION	3
BIOL 301	MICROBIOLOGY	5
BIOL 310	FUNDAMENTALS OF GENETICS	5
BIOL 436	CELL BIOLOGY	5
BIOL 438	MOLECULAR BIOLOGY	5
BIOL 484	TOPICS IN MOLECULAR BIOTECHNOLOGY	2
BIOL 485	MOLECULAR BIOTECHNOLOGY	5
BIOL 488	MOLECULAR BIOTECHNOLOGY LABORATORY	2

Choose from the following **10**

BIOL 302	BOTANY	
BIOL 304	VERTEBRATE ZOOLOGY	
BIOL 420	EPIDEMIOLOGY	
BIOL 421	MEDICAL BACTERIOLOGY	
BIOL 430	IMMUNOLOGY	
BIOL 432	VIROLOGY	
BIOL 460	HEMATOLOGY	
BIOL 477	EMBRYOLOGY	
CHEM 481	INTERMEDIARY METABOLISM	
CSCD 409	SCIENTIFIC PROGRAMMING	
MATH 162	CALCULUS II	

Required Supporting Courses

CHEM 171 & 171L & CHEM 172 & CHEM 172L & CHEM 173 & CHEM 173L	GENERAL CHEMISTRY I and GENERAL CHEMISTRY LABORATORY I and GENERAL CHEMISTRY II and GENERAL CHEMISTRY LABORATORY II and GENERAL CHEMISTRY III and GENERAL CHEMISTRY LABORATORY III	15
CHEM 304 & 304L	QUANTITATIVE ANALYSIS and QUANTITATIVE ANALYSIS LAB	6
CHEM 351	ORGANIC CHEMISTRY	4
CHEM 352	ORGANIC CHEMISTRY	4
CHEM 372	ORGANIC CHEMISTRY LABORATORY I	3
CHEM 480	BIOCHEMISTRY	5
MATH 161	CALCULUS I	5
MATH 380 or BIOL 380	ELEMENTARY PROBABILITY AND STATISTICS DATA ANALYSIS FOR BIOLOGISTS	5
PHYS 131 or PHYS 151	INTRODUCTORY PHYSICS I GENERAL PHYSICS I	4
PHYS 132 or PHYS 152	INTRODUCTORY PHYSICS II GENERAL PHYSICS II	4
PHYS 133	INTRODUCTORY PHYSICS III	4

or PHYS 153	GENERAL PHYSICS III	
PHYS 161	MECHANICS LABORATORY	1
PHYS 162	HEAT AND OPTICS LABORATORY	1
PHYS 163	ELECTRONICS LABORATORY I	1
Required Senior Capstone		
BIOL 490A	BIOTECHNOLOGY CAPSTONE	5
Total Credits		124

Plan of Study

The following plan of study is for a student with zero credits. Individual students may have different factors such as: credit through transfer work, Advanced Placement, Running Start, or any other type of college-level coursework that requires an individual plan.

Courses may be offered in different terms and not all courses are offered every term, checking the academic schedule is paramount in keeping an individual plan current. There may be some courses that have required prerequisites not listed in the plan, review the course descriptions for information. **Students should connect with an advisor to ensure they are on track to graduate.**

All Undergraduate students are required to meet the Undergraduate Degree Requirements (<http://catalog.ewu.edu/undergraduate-degree/>).

First Year			
Fall Quarter	Credits Winter Quarter	Credits Spring Quarter	Credits
BIOL 171	5 BIOL 172	5 BIOL 173	5
CHEM 171 & 171L (Natural Science BACR 1)	5 CHEM 172 & 172L (Natural Science BACR 2)	5 BIOL 270	3
ENGL 101	5 ENGL 201	5 CHEM 173 & 173L	5
	15	15	13
Second Year			
Fall Quarter	Credits Winter Quarter	Credits Spring Quarter	Credits
BIOL 310	5 CHEM 304 & 304L	6 BIOL 301	5
MATH 161	5 PHYS 132 & PHYS 162	5 PHYS 133 & PHYS 163	5
PHYS 131 & PHYS 161	5 Global Studies - graduation requirement ¹	5 Humanities & Arts BACR 1 ¹	5
	15	16	15
Third Year			
Fall Quarter	Credits Winter Quarter	Credits Spring Quarter	Credits
BIOL 436	5 BIOL 438	5 CHEM 480	5
CHEM 351	4 CHEM 352	4 Elective - certificate, minor, or general elective	5
MATH 380 or BIOL 380	5 CHEM 372	3 Elective - certificate, minor, or general elective	4
		Social Science BACR 1 ¹	5
	14	17	14
Fourth Year			
Fall Quarter	Credits Winter Quarter	Credits Spring Quarter	Credits
BIOL 484	2 BIOL 485	5 BIOL 490A (Senior Capstone - graduation requirement)	5
Biology Elective ²	5 BIOL 488	2 Biology Elective ²	5
Humanities & Arts BACR 2 ¹	5 Diversity - graduation requirement ¹	5 Social Science BACR 2 ¹	5
Elective - certificate, minor, or general elective	4 Elective - certificate, minor, or general elective	3	
	16	15	15
Total Credits 180			

¹ University Graduation Requirements (UGR) and Breadth Area Course Requirements (BACR) courses may be less than 5 credits and additional credits may be required to reach the required 180 total credits needed to graduate. Students should connect with an advisor to ensure they are on track to graduate.

² Biology Elective—choose 10 credits from the approved list.

University Competencies and Proficiencies

English (<http://catalog.ewu.edu/undergraduate-degree/#newitemtext>)

Quantitative and Symbolic Reasoning (<http://catalog.ewu.edu/undergraduate-degree/#mathcompproficiencies>)

Placement and Clearance (<http://catalog.ewu.edu/placement/>)

Prior Learning/Sources of Credit AP, CLEP, IB (<http://catalog.ewu.edu/prior-learning/>)

General Education Requirements (<http://catalog.ewu.edu/undergraduate-degree/#generaleducationrequirementstext>) (GER)

- Minimum Credits—180 cumulative credit hours
 - 60 upper-division credits (300 level or above)
 - 45 credits in residence (attendance) at Eastern, with at least 15 upper-division credits in major in residence at Eastern
- Minimum Cumulative GPA ≥ 2.0

Breadth Area Core Requirements (BACR)

Humanities and Arts (<http://catalog.ewu.edu/undergraduate-degree/#humanitiesandfineartsgecrtext>)

Natural Sciences (<http://catalog.ewu.edu/undergraduate-degree/#naturalsciencesgecrtext>)

Social Sciences (<http://catalog.ewu.edu/undergraduate-degree/#socialsciencesgecrtext>)

University Graduation Requirements (<http://catalog.ewu.edu/undergraduate-degree/#universitygraduationrequirementstext>) (UGR)

Diversity Course List (<http://catalog.ewu.edu/undergraduate-degree/#cultureandgenderdiversityintheuslisttext>)

World Language (<http://catalog.ewu.edu/undergraduate-degree/#worldlanguagetext>) (for Bachelor of Arts)

Global Studies Course List (<http://catalog.ewu.edu/undergraduate-degree/#internationalstudiesrequirementtext>)

Minor or Certificate (<http://catalog.ewu.edu/undergraduate-degree/#majorminororcertificateugrtext>)

Senior Capstone Course List (<http://catalog.ewu.edu/undergraduate-degree/#capstonecourselisttext>)

Application for Graduation (use EagleNET (<https://inside.ewu.edu/eaglenet/>)) must be made at least two terms in advance of the term you expect to graduate (undergraduate and post-baccalaureate).

Use the Catalog Archives (<http://catalog.ewu.edu/archives/>) to determine *two important catalog years*.

Requirements in Degree Works (<https://inside.ewu.edu/records-and-registration/degree-works/>) are based on these two catalog years:

- a. The catalog *in effect at the student's first term* of current matriculation is used to determine **BACR** (Breadth Area Credit Requirements) **and UGR** (Undergraduate Graduation Requirements).
- b. The catalog *in effect at the time the student declares a major or minor* is used to determine the program requirements.

Students who earn a BS in Biology with Biotechnology from EWU should be able to:

- demonstrate knowledge of biotech-specific approaches for development of new or improvement of existing products
- demonstrate knowledge of evolution, molecular biology, and cell biology;
- design laboratory or field experiments;
- interpret observations through the creation, testing, and analysis of hypotheses;
- inspect data and apply basic statistics to their analysis and communication;
- write reports and prepare and deliver oral reports that:
 - demonstrate ability to use scientific journals, periodicals, and electronic media to access current biological information;
 - demonstrate ability to evaluate journal articles from the primary literature.