

BIOLOGY: CELLULAR & MOLECULAR BIOSCIENCES CONCENTRATION, BACHELOR OF SCIENCE

Expected Student Outcomes

- Students will develop a broad-based knowledge of concepts and terminology in molecular, cellular, organismal, and ecological biology.
- Students will develop applied scientific skills through field and laboratory experience and data analysis.
- Students will develop skills in reading and interpreting the scientific literature and in presenting a synthesis of it accurately in oral and written form.
- Students will demonstrate critical thinking and problem solving skills using experimental design and the scientific method.

Outcomes Assessment Activities

Assessment of students' improvement in intellectual skills, knowledge and capacities from entrance to graduation will be accomplished through the use of several tools. Exams and course assignments will be used as one measure of the student's proficiency in writing skills, acquisition of knowledge, communication, problem solving and laboratory skills. All majors will take a Senior Seminar that requires scientific literature interpretation along with oral and written presentations evaluated by peers and department faculty. Seniors will also take the Biology Major Field Test, which measures Colorado State University Pueblo students' content knowledge and analytical skills against national norms.

Specific Program Requirements

- Students majoring in biology must receive a grade of C or better (2.000) in all core biology courses.
- Students graduating with a BS in biology must have at least a cumulative GPA of 2.000 in the major area. A cumulative GPA of 2.600 in the major area is required for admission to the teacher education program.
- Transfer students are required to earn a minimum of 15 semester credit hours in approved Biology upper division courses from CSU-Pueblo, including BIOL 493 SEMINAR (1.00 c.h.), for graduation with a BS degree in Biology.
- A maximum of 6 semester credit hours of approved upper division CHEM courses may be applied towards approved upper division biology electives.
- A maximum of 6 semester credit hours of approved upper division WANR courses may be applied towards approved upper division biology electives.
- Graduates are encouraged to complete a minor outside the biology department.

Specific Core Requirements

Course	Title	Credits
BIOL 171	First Year Seminar	1
BIOL 181 & 181L	College Biology I/Organismal Bio and College Biology I/Organismal Bio Lab	4

BIOL 182 & 182L	College Biology II/Cellular Biology and College Biology II/Cellular Bio Lab	4
Select one of the following:		4
BIOL 201 & 201L	Botany and Botany Laboratory	4
BIOL 202 & 202L	Zoology and Zoology Laboratory	4
BIOL 301 & 301L	General Microbiology and General Microbiology Lab	5
BIOL 350	Mendelian and Population Genetics	2
BIOL 351	Molecular Biology and Genetics	2
BIOL 352	Evolutionary Biology and Ecology	3
Select one of the following:		4
BIOL 412 & 412L	Cellular Biology and Cellular Biology Lab	4
BIOL 413 & 413L	Plant Physiology and Plant Physiology Lab	4
BIOL 414 & 414L	Vertebrate Physiology and Vertebrate Physiology Lab	4
BIOL 493	Seminar	1
Total Credits		30

Specific Concentration Requirements

Course	Title	Credits
Required Biology Core Courses		
Biology Required Core with the following:		30
BIOL 412 & 412L	CELLULAR BIOLOGY and CELLULAR BIOLOGY LAB	4
Required Elective Courses		
BIOL 351L	MOLECULAR BIOLOGY & GENETICS LABORATORY	2
CHEM 311	BIOCHEMISTRY SURVEY	3
or CHEM 411	BIOCHEMISTRY I	
Adviser Approved Upper Division Biology Electives		
Select 10 credits		10
Required Support Courses		
CHEM 121 & 121L	GENERAL CHEMISTRY I and GENERAL CHEMISTRY LAB I	5
CHEM 122 & 122L	GENERAL CHEMISTRY II and GENERAL CHEMISTRY LAB II	5
CHEM 301 & 301L	ORGANIC CHEMISTRY I and ORGANIC CHEMISTRY LAB I	5
CHEM 302 & 302L	ORGANIC CHEMISTRY II and ORGANIC CHEMISTRY LAB II	5
MATH 156	INTRODUCTION TO STATISTICS	3
MATH 221	APPLIED CALC: AN INTUITIVE APPROACH	4
Select one of the following sequences:		8-10
Sequence A:		
PHYS 201 & 201L	PRINCIPLES OF PHYSICS I and PRINCIPLES OF PHYSICS LAB I	4
PHYS 202 & 202L	PRINCIPLES OF PHYSICS II and PRINCIPLES OF PHYSICS II LAB	4
Sequence B:		
PHYS 221 & 221L	GENERAL PHYSICS I and GENERAL PHYSICS I LAB	5

PHYS 222 & 222L	GENERAL PHYSICS II and GENERAL PHYSICS II LAB	5
COMR 103	SPEAKING AND LISTENING (H)	3
Institutional and General Education		
Select 21 credits		21
General Electives		
Select 14-16 credits		14-16
Total Credits		118-122

Planning Sheet

Disclaimer: The Planning Sheet is designed as a guide for student's planning their course selections. The information on this page provides only a suggested schedule. Actual course selections should be made with the advice and consent of an academic advisor. While accurately portraying the information contained in the college catalog, this form is not considered a legal substitute for that document. Students should become familiar with the catalog in effect at the time in which they entered the institution.

Course	Title	Credits
Year 1		
Fall		
BIOL 171	First Year Seminar	1
BIOL 181 & 181L	College Biology I/Organismal Bio (GT-SC2) and College Biology I/Organismal Bio Lab (GT-SC1)	4
CHEM 121 & 121L	General Chemistry I (GT-SC2) and General Chemistry Lab I (GT-SC1)	5
ENG 101	Rhetoric & Writing I (GT-CO1)	3
	Credits	13
Spring		
BIOL 182 & 182L	College Biology II/Cellular Biology (GT-SC2) and College Biology II/Cellular Bio Lab (GT-SC1)	4
CHEM 122 & 122L	General Chemistry II (GT-SC2) and General Chemistry Lab II (GT-SC1)	5
ENG 102	Rhetoric & Writing II (GT-CO2)	3
MATH 221	Applied Calc: An Intuitive Approach (GT-MA1)	4
	Credits	16
Year 2		
Fall		
BIOL 201 or BIOL 202	Botany (GT-SC2) or Zoology	2
BIOL 201L or BIOL 202L	Botany Laboratory (GT-SC1) or Zoology Laboratory	2
CHEM 301 & 301L	Organic Chemistry I and Organic Chemistry Lab I	5
PHYS 201 or PHYS 221	Principles of Physics I (GT-SC2) or General Physics I (GT-SC2)	3-4
PHYS 201L or PHYS 221L	Principles of Physics Lab I (GT-SC1) or General Physics I Lab (GT-SC1)	1
MATH 156	Introduction to Statistics (GT-MA1)	3
	Credits	16-17
Spring		
BIOL 350	Mendelian and Population Genetics	2
CHEM 302 & 302L	Organic Chemistry II and Organic Chemistry Lab II	5
COMR 103	Speaking and Listening	3
PHYS 202 or PHYS 222	Principles Of Physics II (GT-SC2) or General Physics II (GT-SC2)	3-4
PHYS 202L or PHYS 222L	Principles Of Physics II Lab (GT-SC1) or General Physics II Lab (GT-SC1)	1
General Education		3
	Credits	17-18

Year 3		
Fall		
BIOL 301 & 301L	General Microbiology and General Microbiology Lab	5
CHEM 311 or CHEM 411	Biochemistry Survey or Biochemistry I	3
General Education		6
	Credits	14
Spring		
BIOL 351 & 351L	Molecular Biology and Genetics and Molecular Biology & Genetics Laboratory	4
BIOL 352	Evolutionary Biology and Ecology	3
General Education		6
Elective		3
	Credits	16
Year 4		
Fall		
Elective	7 credits must be upper division Biology course.	14
	Credits	14
Spring		
BIOL 412 & 412L	Cellular Biology and Cellular Biology Lab	4
BIOL 493	Seminar	1
Elective	3 credits must be upper division Biology course.	9
	Credits	14
	Total Credits	120-122