

BIOLOGY: BIOLOGY/ CHEMISTRY DOUBLE MAJOR 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		
Biology Core with one of the following:		30
BIOL 493	SEMINAR	1
or CHEM 493SEMINAR		
Adviser Approved Biology Electives		
Select 10 credits		10
Required Support Courses		
MATH 126	CALCULUS AND ANALYTIC GEOMETRY I	5
MATH 224	CALCULUS AND ANALYTIC GEOMETRY II	5
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	3
Chemistry Core		
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 221 & 221L	Inorganic Chemistry and Inorganic Chem Lab	4
CHEM 301 & 301L	ORGANIC CHEMISTRY I and ORGANIC CHEMISTRY LAB I	5

CHEM 302 & 302L	ORGANIC CHEMISTRY II and ORGANIC CHEMISTRY LAB II	5
CHEM 317 & 317L	QUANTITATIVE ANALYSIS and QUANTITATIVE ANALYSIS LAB	5
CHEM 321	PHYSICAL CHEMISTRY I	3
CHEM 322	PHYSICAL CHEMISTRY II	3
CHEM 419 & 419L	INSTRUMENTAL ANALYSIS and INSTRUMENTAL ANALYSIS LAB	5
Institutional and General Education		
Select 21 credits		21
Total Credits		122-124