

BIOLOGY: SECONDARY CERTIFICATION 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 Concentration Requirements

Students completing a major in Biology with a concentration in Secondary Education are required to complete a minor in Education and meet all other requirements outlined by the Teacher Education Program.

Course	Title	Credits
Required Courses		
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 350	MENDELIAN AND POPULATION GENETICS	2
BIOL 351	MOLECULAR BIOLOGY AND GENETICS	2
Select one of the following:		4-5
BIOL 206 & 206L	INTRODUCTION TO MICROBIOLOGY and INTRODUCTION TO MICROBIOLOGY LAB	4
BIOL 301 & 301L	GENERAL MICROBIOLOGY and GENERAL MICROBIOLOGY LAB	5
Select one of the following:		4
BIOL 223 & 223L	HUMAN PHYSIOLOGY AND ANATOMY I and HUMAN PHYSIOLOGY AND ANATOMY I LAB	4
BIOL 224 & 224L	HUMAN PHYSIOLOGY AND ANATOMY II and HUMAN PHYSIOLOGY AND ANATOMY II LAB	4
BIOL 414 & 414L	VERTEBRATE PHYSIOLOGY and VERTEBRATE PHYSIOLOGY LAB	4
BIOL 352	EVOLUTIONARY BIOLOGY AND ECOLOGY	3
BIOL 378	LABORATORY IN TEACHING BIOLOGY	1
Select one Biology Upper Division Field Elective/Lab		3-4
Select one Approved Biology Upper Division Elective/Lab		3
BIOL 493	SEMINAR	1
CHEM 121 & 121L	GENERAL CHEMISTRY I and GENERAL CHEMISTRY LAB I	5
CHEM 122 & 122L	GENERAL CHEMISTRY II and GENERAL CHEMISTRY LAB II	5
Select one of the following:		4-5
CHEM 211 & 211L	INTRODUCTION TO ORGANIC CHEMISTRY and INTRO TO ORGANIC CHEMISTRY LAB	4
CHEM 301 & 301L	ORGANIC CHEMISTRY I and ORGANIC CHEMISTRY LAB I	5
GEOL 101 & 101L	EARTH SCIENCE and EARTH SCIENCE LAB	4
MATH 221	APPLIED CALC: AN INTUITIVE APPROACH	4
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
Education Minor		
Education Minor		34
Institutional and General Education Courses		
Select 24 credits to include the following:		24
PSYC 151	HUMAN DEVELOPMENT	3.0
or PSYC 251 CHILDHOOD AND ADOLESCENCE		

COMR 103 SPEAKING AND LISTENING (grade of B or better 3 required)

Total Credits 123-126

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.

Note: Students completing a major with a concentration in Secondary Education are required to complete a minor in Education and to meet all other requirements outlined by the Teacher Education Program.

*COMR 103 is required for admission into the Teacher Education Program.

Course	Title	Credits
Year 1		
Fall		
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
ED 202	Foundations of Education	3
ENG 101	Rhetoric & Writing I (GT-CO1)	3
Credits		15
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
MATH 221	Applied Calc: An Intuitive Approach (GF-MA1)	4
ENG 102	Rhetoric & Writing II (GT-CO2)	3
Credits		16
Year 2		
Fall		
BIOL 350	Mendelian and Population Genetics	2
BIOL 201 or BIOL 202	Botany (GT-SC2) or Zoology	2
BIOL 201L or BIOL 202L	Botany Laboratory (GT-SC1) or Zoology Laboratory	2
COMR 103	Speaking and Listening (*)	3
ED 280	Educational Media and Technology	3
General Education		3
Credits		15
Spring		
BIOL 351	Molecular Biology and Genetics	2
CHEM 211 or CHEM 301	Introduction to Organic Chemistry or Organic Chemistry I	3
CHEM 211L or CHEM 301L	Intro to Organic Chemistry Lab or Organic Chemistry Lab I	1-2
ED 301	Frameworks of Teaching	4
PHYS 201 & 201L	Principles of Physics I (GT-SC2) and Principles of Physics Lab I (GT-SC1)	4
PSYC 151 or PSYC 251	Human Development (GT-SS3) or Childhood and Adolescence	3
Credits		17-18

Year 3

Fall

BIOL 223 or BIOL 224 or BIOL 414	Human Physiology and Anatomy I (GT-SC2) or Human Physiology and Anatomy II (GT-SC2) or Vertebrate Physiology	3
BIOL 223L or BIOL 224L or BIOL 414L	Human Physiology and Anatomy I Lab (GT-SC1) or Human Physiology and Anatomy II Lab (GT-SC1) or Vertebrate Physiology Lab	1
PHYS 202 & 202L	Principles Of Physics II (GT-SC2) and Principles Of Physics II Lab (GT-SC1)	4
RDG 435	Content Area Literacy	4
General Education		3

Credits 15

Spring

BIOL 352	Evolutionary Biology and Ecology	3
BIOL 378	Laboratory in Teaching Biology	1
ED 412	Teaching Diverse Learners	3
GEOL 101 & 101L	Earth Science (GT-SC2) and Earth Science Lab (GT-SC1)	4
General Education		3
Elective	Must be upper division Biology course.	3

Credits 17

Year 4

Fall

BIOL 206 or BIOL 301	Introduction to Microbiology or General Microbiology	3
BIOL 206L or BIOL 301L	Introduction to Microbiology Lab or General Microbiology Lab	1-2
BIOL 493	Seminar	1
ED 444	Teaching Secondary Science	4
General Education		3
Elective	Must be upper division Biology course.	3

Credits 15-16

Spring

ED 485	Capstone Seminar in Education	1
ED 488	Student Teaching Secondary	12
Credits		13

Total Credits 123-125