# Program Overview: Bachelor of Science, Biological Sciences
# Biology Secondary Education Concentration

## About This Major . . .

The Biology program offers coursework, in conjunction with the Center for Teacher Education, leading to licensure in secondary education science. Graduates of the program can teach in the state of Colorado or use their teaching expertise in other careers. After completing foundation sciences classes in Biology, Chemistry, Physics and Geology, students choose 10 hours of upper level Biology course work, in consultation with their advisor.

The secondary licensure program provides teacher education candidates with broad content knowledge in science and prepares them as teachers for grades 7 through 12. A minimum of 75 credit hours of Essential Learning and content area coursework must be completed with a minimum GPA of 2.80 before a candidate may apply for admission to the Center for Teacher Education secondary licensure program. Please see the Teacher Education Admission Packet for further information on admissions criteria. EDUC 115, What It Means to be a Teacher, and EDUC 215, Teaching as a Profession, must be taken before applying to the program.

For more information on what you can do with this major, go to http://www.coloradomesa.edu/career/whatmajor.html.

**All CMU baccalaureate graduates are expected to demonstrate proficiency in critical thinking, communication fluency, quantitative fluency, and specialized knowledge/applied learning.**

Biology graduates will be able to demonstrate:

1. Utilize the scientific approach to address novel questions and problems through the development of hypotheses, design of experiments, collection of data, analysis of data, and interpretation of results. (Quantitative Fluency/Applied Learning)
2. Identify, examine, evaluate and discuss the scientific literature. (Critical Thinking)
3. Articulate biological principles and ideas effectively, both in written and oral form. (Communication Fluency)
4. Instruct K-12 students based on self-written learning plans to address individual learning and developmental patterns in the Biological Sciences. (Specialized Knowledge)
5. Design a safe and supportive learning environment for elementary and secondary education students. (Applied Learning)
6. Apply Biology content knowledge while working with learners to access information in real world settings assuring learner mastery of Biological Sciences. (Specialized Knowledge)
7. Integrate assessment, planning, and instructional strategies in coordinated and engaging ways through multiple means of communication. (Critical Thinking/Communication Fluency)
8. Engage in meaningful and intensive professional learning and self-renewal by regularly examining practice through ongoing study, self-reflection, and collaboration. (Specialized Knowledge)

## Program Highlights:

**A Lab-Based Science**
Most Biology courses have labs, including field based exercises.

**Undergraduate Research**
There are opportunities to work on research projects with faculty supervision.

**Get Smarter**
Consider an advanced degree. A Biological Sciences Degree is a great launching point for further education in a biological discipline or within education.

**Get Involved**
Join the Biology Club, Fish and Wildlife Club, Medical Sciences Club, and Honors Program. Learn about Teaching by joining one of the student education clubs that work on special events in area K-12 schools.

## Program Requirements

A student must follow CMU graduation requirements by completing 120 semester credit hours, including 40 credits of coursework at the 300+ level. See the "Undergraduate Graduation Requirements" in the catalog for additional graduation information. Students should work closely with a faculty advisor when selecting and scheduling courses prior to registration. In general, CMU's programs of study are based on two curriculum groups:

1. **Essential Learning**
   CMU's Essential Learning program provides the foundation of skills and information that cuts across all fields of study and the support for advanced concepts that students will later encounter in their majors. Before moving into work at the 300+ level, students complete the Maverick Milestone and its co-requirement, Essential Speech. This pair of courses is a capstone experience where students integrate what they have learned from their foundation courses by making connections among diverse areas of knowledge. The capstone is also an opportunity for students to work with disparate ideas, a critical skill expected of all CMU graduates that will aid them in solving the complex and unscripted problems they will encounter in their personal, professional, and civic lives.
2. **What You Will Study in This Major. . .**

**Foundational Courses**
These courses provide you with necessary science background to prepare you for science licensure:
- General Chemistry and Lab
- General Physics and Lab
- Principles of Geology and Lab
- STAT 200 Probability and Statistics

**Biology Core**
All students also complete these advanced courses which focus on fundamental knowledge in Biology, sophisticated reading and evaluation of primary scientific literature, and a capstone course that allows you to demonstrate what you have learned with a written thesis report:
- Attributes of Living Systems
- Principles of Animal Biology
- Principles of Plant Biology
- Nature and Philosophy of Science
- Senior Thesis

**Secondary Education Requirements**
Here you will learn the theory and practice of education and will gain considerable experience in the secondary school classroom:
- Foundations of Education
- Pedagogy and Assessment: Secondary/K-12
- Teaching to Diversity
- Integrating Literacy Across the Curriculum
- Content Methodology Practicum
- Methods of Teaching Secondary Sciences
- Teaching Internship and Colloquium

**Electives**
These electives supplement or complement your choices in Biology, depending upon your career goals:
- BIOL 387 Structured Research
- BIOL 487 Advanced Research
- BIOL 499 Internship

**Specialty Courses**
You can choose from the courses below that align with your chosen concentration, personal goals and interests:

Category I:
**Cellular, Developmental and Molecular**
- Cell Biology
- Developmental Biology
- Immunology
- Molecular Genetics
- Pharmacology

Category 2:
**Organismal**
- Plant Identification
- Insect Biology
- Marine Biology
- Invertebrate Zoology
- Microbiology
- Mammalogy
- Ornithology
- Herpetology
- Animal Behavior

Category 3:
**Anatomical and Physiological**
- Human Anatomy and Physiology
- General Physiology
- Gross Human Anatomy
- Plant Physiology
- Plant Anatomy
- Endocrinology

Category 4:
**Ecology and Evolution**
- Epidemiology
- Plant Systematics
- Taxonomy of Grasses
- Plant-Animal Interaction
- Advanced Ecological Methods
- Desert Ecology
- Aquatic Biology
- Tropical Ecosystems

For more information about this major, go to: http://www.coloradomesa.edu/biology/degrees.html or contact the Academic Department Head for Biological Sciences, 228D Wubben Hall, 970.248.1015.