



2016-2017 PETITION/PROGRAM SHEET

Degree: Bachelor of Science
Major: Biological Sciences
Concentration: Biology

About This Major . . .

The Bachelor of Science degree with a Biological Science major provides a broad background in the biological sciences. Students choose biology courses from four areas: cell, developmental, and molecular biology; anatomical and physiological biology; organismal biology; and ecology, evolution, and systematics.

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. In addition to these campus-wide student learning outcomes, graduates of this major will be able to:

- 1. Demonstrate a breadth of knowledge in the life sciences with an accompanying depth of knowledge particularly in the key areas of cell and molecular biology, organismal diversity, ecology, evolution and genetics. (Specialized Knowledge)
2. 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)
3. Identify, examine, evaluate and discuss the scientific literature. (Critical Thinking)
4. Articulate biological principles and ideas effectively, both in written and oral form. (Communication Fluency)

NAME: \_\_\_\_\_ STUDENT ID #: \_\_\_\_\_

LOCAL ADDRESS AND PHONE NUMBER: \_\_\_\_\_

\_\_\_\_\_ ( ) \_\_\_\_\_

I, (Signature) \_\_\_\_\_, hereby certify that I have completed (or will complete) all the courses listed on the Program Sheet. I have read and understand the policies listed on the last page of this program sheet. I further certify that the grade listed for those courses is the final course grade received except for the courses in which I am currently enrolled and the courses which I complete next semester. I have indicated the semester in which I will complete these courses.

Signature of Advisor \_\_\_\_\_ Date \_\_\_\_\_ 20\_\_

Signature of Department Head \_\_\_\_\_ Date \_\_\_\_\_ 20\_\_

Signature of Registrar \_\_\_\_\_ Date \_\_\_\_\_ 20\_\_

**DEGREE REQUIREMENTS:**

- 120 semester hours total (Students must complete a minimum of 30 of the last 60 hours of credit at CMU, with at least 15 semester hours in major discipline courses numbered 300 or higher).
- 40 upper division credits (A minimum of 15 taken at the 300-400 course levels within the major at CMU).
- 2.0 cumulative GPA or higher in all CMU coursework
- A 2.5 GPA is required in the major courses. A "C" or higher is required in all major courses.
- Pre-collegiate courses (usually numbered below 100) cannot be used for graduation.
- A student must follow the CMU graduation requirements either from 1) the program sheet for the major in effect at the time the student officially declares a major; or 2) a program sheet for the major approved for a year subsequent to the year during which the student officially declares the major and is approved for the student by the department head. Because a program may have requirements specific to the degree, the student should check with the faculty advisor for additional criteria. It is the student's responsibility to be aware of, and follow, all requirements for the degree being pursued. Any exceptions or substitutions must be approved by the student's faculty advisor and Department Head.
- When filling out the program sheet a course can be used only once.
- Essential Learning Capstone should be completed between 45 and 75 hours.
- See the "Requirements for Undergraduate Degrees and Certificates" in the catalog for additional graduation information.

**ESSENTIAL LEARNING REQUIREMENTS** (31 semester hours)

See the current catalog for a list of courses that fulfill the requirements below. If a course is an Essential Learning option and a requirement for your major, you must use it to fulfill the major requirement and make a different selection for the Essential Learning requirement.

Course No	Title	Sem.hrs	Grade	Term	Trns
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**English** (6 semester hours, must receive a grade of "C" or better and must be completed by the time the student has 60 semester hours.)

ENGL 111	English Composition	3	_____	_____	_____
ENGL 112	English Composition	3	_____	_____	_____

**Math MATH 113 or higher** (3 semester hours, must receive a grade of "C" or better, must be completed by the time the student has 60 semester hours.)

MATH 113	College Algebra	4*	_____	_____	_____
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\*3 credits apply to the Essential Learning requirements and 1 credit applies to elective credit

**Humanities** (3 semester hours)

\_\_\_\_\_

**Social and Behavioral Sciences** (6 semester hours)

\_\_\_\_\_

**Natural Sciences** (7 semester hours, one course must include a lab)

\_\_\_\_\_

_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	L	_____	_____	_____	_____

**History** (3 semester hours)

HIST	_____	_____	_____	_____	_____
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**Fine Arts** (3 semester hours)

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Course No	Title	Sem.hrs	Grade	Term	Trns
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**WELLNESS REQUIREMENT** (2 semester hours)

KINE 100	Health and Wellness	1	_____	_____	_____
KINA 1	_____	1	_____	_____	_____

**ESSENTIAL LEARNING CAPSTONE** (4 semester hours)

ESSL 290	Maverick Milestone (see English & math pre-reqs)	3	_____	_____	_____
ESSL 200	Essential Speech (co-requisite)	1	_____	_____	_____

**FOUNDATION COURSES** (17 semester hours) Must receive a grade of "C" or better and should be completed by the end of the sophomore year.

BIOL 105	Attributes of Living Systems	3	_____	_____	_____
BIOL 105L	Attributes of Living Systems Lab	1	_____	_____	_____
CHEM 131*	General Chemistry	4	_____	_____	_____
CHEM 131L*	General Chemistry Lab	1	_____	_____	_____
CHEM 132*	General Chemistry II	4	_____	_____	_____
CHEM 132L*	General Chemistry II Lab	1	_____	_____	_____
STAT 200	Probability and Statistics	3	_____	_____	_____

**OR**

*MATH 146	Calculus for Biological Sciences	3	_____	_____	_____
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\*If MATH 146 is taken, 2 credits apply to elective credit

**BIOLOGICAL SCIENCES MAJOR REQUIREMENTS**

(48 semester hours) A 2.5 GPA is required in the major courses. A "C" or better is required in all major courses.

**Required Core Courses** (10 semester hours)

BIOL 208	Ecology and Evolution	3	_____	_____	_____
BIOL 208L	Ecology and Evolution Lab	1	_____	_____	_____
BIOL 301	Principles of Genetics	3	_____	_____	_____
BIOL 301L	Principles of Genetics Lab	1	_____	_____	_____
BIOL 483	Senior Thesis	2	_____	_____	_____

**Required Related Study Area** (18 semester hours) Should be

completed by the end of the sophomore year.

BIOL 106	Principles of Animal Biology	3	_____	_____	_____
BIOL 106L	Principles of Animal Biology Lab	1	_____	_____	_____
BIOL 107	Principles of Plant Biology	3	_____	_____	_____
BIOL 107L	Principles of Plant Biology Lab	1	_____	_____	_____
PHYS 111*	General Physics	4	_____	_____	_____
PHYS 111L*	General Physics Lab	1	_____	_____	_____
PHYS 112*	General Physics	4	_____	_____	_____
PHYS 112L*	General Physics Lab	1	_____	_____	_____

\* A higher level subject may be taken in the same category with advisor approval.

Course No Title Sem.hrs Grade Term/Trns  
**Additional Biology Courses** (20 semester hours) At least 50% must be at the 300 level or above. Courses must be selected from three of the following four areas: (1) Cell, Molecular, and Developmental; (2) Organismal; (3) Anatomical and Physiological; (4) Ecology, Evolution, and Systematics. At least ONE of the following must be included: BIOL 302, BIOL 341/341L, OR BIOL 421/421L.

Category 1: Cellular, Developmental and Molecular

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Category 2: Organismal

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Category 3: Anatomical and Physiological

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Course No Title Sem.hrs Grade Term/Trns  
Category 4: Ecology, Evolution and Systematics

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

**ELECTIVES** (18 semester hours) (All college level courses appearing on your final transcript **not listed above** that will bring your total semester hours to 120 hours, including 40 upper-division credit hours.) Up to 24 upper-division hours may be needed.

*MATH 113	College Algebra	1	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

**Additional Biology Courses (20 semester hours minimum) At least 50% must be at the 300 level or above. Courses must be selected from three of the following four areas:**

Category 1: Cellular, Molecular, and Developmental

- †BIOL 302 Cellular Biology (3)
- BIOL 310/310L Developmental Biology and Lab (3) / (2)
- BIOL 343 Immunology (3)
- BIOL 344/344L Forensic Molecular Biology and Lab (3) / (1)
- BIOL 371L Lab Investigations in Cellular and Molecular Biology (3)
- BIOL 425 Molecular Genetics (3)
- BIOL 442 Pharmacology (3)
- CHEM 315/315L Biochemistry I and Lab (3) / (1)

Category 2: Organismal

- BIOL 250/250L Intro to Microbiology and Lab (3) / (2)
- BIOL 316/316L Animal Behavior and Lab (3) / (1)
- BIOL 322/322L Plant Identification and Lab (2) / (2)
- BIOL 331/331L Insect Biology and Lab (3) / (2)
- BIOL 333 Marine Biology (3)
- BIOL 335/335L Invertebrate Zoology and Lab (3) / (1)
- BIOL 336/336L Fish Biology and Lab (3) / (1)
- BIOL 350/350L Microbiology and Lab (3) / (1)
- BIOL 411/411L Mammalogy and Lab (3) / (1)
- BIOL 412/412L Ornithology and Lab (3) / (1)
- BIOL 413/413L Herpetology and Lab (3) / (1)
- BIOL 431/431L Animal Parasitology and Lab (3) / (1)
- BIOL 433 Marine Invertebrate Communities (3)
- BIOL 450/450L Mycology and Lab (3) / (2)

Category 3: Anatomical and Physiological

- BIOL 209/209L Human Anatomy & Physiology I and Lab (3) / (1)
- BIOL 210/210L Human Anatomy & Physiology II and Lab (3) / (1)
- BIOL 241 Pathophysiology (4)
- †BIOL 341/341L General Physiology and Lab (3) / (1)
- BIOL 342/342L Histology and Lab (2) / (2)
- BIOL 409/409L Gross and Developmental Human Anatomy (2) / (2)
- BIOL 410/410L Human Osteology and Lab (3) / (1)
- †BIOL 421/421L Plant Physiology and Lab (3) / (1)
- BIOL 423/423L Plant Anatomy and Lab (3) / (2)
- BIOL 426/426L Intro to Electron Microscopy and Lab (2) / (2)
- BIOL 441 Endocrinology (3)

Category 4: Ecology, Evolution, and Systematics

- BIOL 211/211L Ecosystem Biology and Lab (4) / (1)
- BIOL 315 Epidemiology (3)
- BIOL 320 Plant Systematics (3)
- BIOL 321/321L Taxonomy of Grasses and Lab (2) / (2)
- BIOL 403 Evolution (3)
- BIOL 405/405L Adv. Ecological Methods and Lab (3) / (2)
- BIOL 406 Plant-Animal Interactions (3)
- BIOL 407 Tropical Field Biology (3-5)
- BIOL 408 Desert Ecology (3)
- BIOL 414/414L Aquatic Biology and Lab (3) / (1)
- BIOL 415 Tropical Ecosystems (2)
- BIOL 418/418L Wildlife Management and Lab (3) / (2)

† At least one of these lecture/lab courses must be included.

NOTE: Topics courses (BIOL 196/296/396/496) may not be used as Additional Biology Courses but must be used for elective credit.

## SUGGESTED COURSE SEQUENCING FOR A MAJOR IN BIOLOGICAL SCIENCES – BIOLOGY

This is a recommended sequence of course work. Certain courses may have prerequisites or are only offered during the Fall or Spring semesters. It is the student's responsibility to meet with the assigned advisor and check the 2 year course matrix on the Colorado Mesa website for course availability.

### FRESHMAN YEAR

Fall Semester		Hours	Spring Semester		Hours
BIOL 105	Attributes of Living Systems	3	BIOL 106	Principles of Animal Biology	3
BIOL 105L	Attributes of Living Systems Lab	1	BIOL 106L	Principles of Animal Biology Lab	1
CHEM 131	General Chemistry	4	CHEM 132	General Chemistry	4
CHEM 131L	General Chemistry Lab	1	CHEM 132L	General Chemistry Lab	1
MATH 113*	College Algebra	4	MATH 146*	Calculus for Biological Sciences (5)	
KINE 100	Health and Wellness	1	<b>OR</b> STAT 200	Probability and Statistics (3)	3-5
KINA	Activity	<u>1</u>	Essential Learning Fine Arts		<u>3</u>
		15			15-17

\*Professional schools (medical, veterinary, dental) may require one or two semesters of calculus. Math 151 and 152 will fulfill the MATH requirement.

### SOPHOMORE YEAR

Fall Semester		Hours	Spring Semester		Hours
BIOL 107	Principles of Plant Biology	3	BIOL 208	Ecology and Evolution	3
BIOL 107L	Principles of Plant Biology Lab	1	BIOL 208L	Ecology and Evolution Lab	1
PHYS 111	General Physics (or higher)	4	PHYS 112	General Physics (or higher)	4
PHYS 111L	General Physics Lab (or higher)	1	PHYS 112L	General Physics Lab (or higher)	1
ENGL 111	English Composition	3	ENGL 112	English Composition	3
Essential Learning Social/Behavioral Science		<u>3</u>	Essential Learning History		<u>3</u>
		15			15

### JUNIOR YEAR

Fall Semester		Hours	Spring Semester		Hours
BIOL XXX	(selected from list)	7	BIOL XXX	(selected from list)	7
BIOL 301	Principles of Genetics	3	Essential Learning Humanities		3
BIOL 301L	Principles of Genetics	1	Essential Learning Social/Behavioral Science		3
ESSL 290	Maverick Milestone		Electives*	3	<u>3</u>
ESSL 200	Essential Speech	<u>1</u>			16
		15			

### SENIOR YEAR

Fall Semester		Hours	Spring Semester		Hours
BIOL XXX	(selected from list)	6	BIOL 483	Senior Thesis	2
Essential Learning Natural Science		3	Essential Learning Natural Science with Lab		4
Electives*#		<u>6</u>	Electives*#		<u>6-8</u>
		15			12-14

\* It is strongly recommended that all electives be upper division.

# Professional schools (medical, veterinary, dental) may require one or two semesters of organic chemistry, which may be taken to fulfill part of the electives.

#### POLICIES:

1. Please see the catalog for a complete list of graduation requirements.
2. This program sheet must be submitted with your graduation planning sheet to your advisor during the **semester prior to the semester of graduation, no later than October 1 for spring graduates, no later than March 1 for fall graduates.** You must turn in your "Intent to Graduate" form to the Registrar's Office **by September 15 if you plan to graduate the following May, and by February 15 if you plan to graduate the following December.**
3. Your advisor will sign and forward the Program Sheet and Graduation Planning Sheet to the Department Head for signature. Finally, the Department Head will submit the signed forms to the Registrar's Office. (Students cannot handle the forms once the advisor signs.)
4. If your petition for graduation is denied, it will be your responsibility to reapply for graduation in a subsequent semester. Your "Intent to Graduate" does not automatically move to a later graduation date.
5. NOTE: During your senior year, you will be required to take a capstone exit assessment/project (e.g., Major Field Achievement Test).