



2015-2016 PETITION/PROGRAM SHEET

Degree: Bachelor of Science

Major: Chemistry

Concentration: Biochemistry

About This Major . . .

Biochemistry students build a strong foundation in chemistry and apply their knowledge to problems in chemistry and biology. Students learn to critically analyze chemical structures and chemical and biochemical reactions, skills which are necessary for success in fields of biochemistry, medicinal chemistry, medicine, pharmacy and chemical biology. By taking upper division courses in chemistry and biology, biochemistry majors develop a strong understanding of both subjects. Through research under a chemistry or biology faculty member, students can enhance their laboratory and critical thinking skills.

Colorado Mesa University graduates have been successful in finding jobs in the pharmaceutical industry and in secondary education, as well as being placed in graduate, pharmacy and medical schools.

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 fluency in the concepts from major fields of chemistry (organic, physical, analytical, and biochemistry...)
2. Utilize mathematics to solve chemical and biological problems.
3. Employ proper experimental techniques.
4. Interpret chemical and biological information from peer-reviewed publications.
5. Communicate chemical and biological topics effectively, both verbally and in writing.
6. Demonstrate a solid understanding of genetics, cellular, and molecular biology.

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).
- 2.00 cumulative GPA or higher in all CMU coursework.
- A "C" or higher is required in all major and foundation 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 "Undergraduate Graduation Requirements" 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 1XX or higher (3 semester hours, must receive a grade of "C" or better and must be completed by the time the student has 60 semester hours.)

MATH 151	Calculus I	5*	_____	_____
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*3 credits apply to the Essential Learning requirements and 2 credits apply to foundation 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)

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 (21 semester hours) A "C" or higher is required in all foundation courses.

BIOL 105	Attributes of Living Systems	3	_____	_____
BIOL 105L	Attributes of Living Systems Lab	1	_____	_____
MATH 151	Calculus I	2	_____	_____
MATH 152	Calculus II	5	_____	_____
PHYS 131	Fundamental Mechanics		_____	_____
OR		4	_____	_____
PHYS 111	General Physics		_____	_____
PHYS 131L	Fundamental Mechanics Laboratory		_____	_____
OR		1	_____	_____
PHYS 111L	General Physics Laboratory		_____	_____
PHYS 132	Electromagnetism & Optics		_____	_____
OR		4	_____	_____
PHYS 112	General Physics		_____	_____
PHYS 132L	Electromagnetism & Optics Laboratory		_____	_____
OR		1	_____	_____
PHYS 112L	General Physics Laboratory		_____	_____

CHEMISTRY MAJOR, BIOCHEMISTRY CONCENTRATION REQUIREMENTS (54 semester hours)

A "C" or higher is required in all foundation courses.

Chemistry Core Courses (27 semester hours)

CHEM 131	General Chemistry	4	_____	_____
CHEM 131L	General Chemistry Lab	1	_____	_____
CHEM 132	General Chemistry	4	_____	_____
CHEM 132L	General Chemistry Lab	1	_____	_____
CHEM 301	Analytical Chemistry	3	_____	_____
CHEM 301L	Analytical Chemistry Lab	1	_____	_____
CHEM 311	Organic Chemistry	4	_____	_____
CHEM 311L	Organic Chemistry Lab	1	_____	_____
CHEM 312	Organic Chemistry	4	_____	_____
CHEM 312L	Organic Chemistry Lab	1	_____	_____
CHEM 341	Advanced Laboratory I	2	_____	_____
CHEM 442	Communication in Chemistry	1	_____	_____

Biochemistry Concentration Courses (20 semester hours)

CHEM 315	Biochemistry I	3	_____	_____
CHEM 315L	Biochemistry I Lab	1	_____	_____
CHEM 316	Biochemistry II	3	_____	_____
CHEM 321	Physical Chemistry I	3	_____	_____
BIOL 301	Principles of Genetics	3	_____	_____
BIOL 301L	Principles of Genetics Lab	1	_____	_____
BIOL 302	Cellular Biology	3	_____	_____
BIOL 371L	Lab Investigations in Cell Bio	3	_____	_____

Restricted Electives (7 semester hours) Courses are to be chosen from the list on pg 3, no more than 4 semester hours can come from CHEM 397, CHEM 487, CHEM 497, BIOL 387, or BIOL 487):

Course No	Title	Sem.hrs	Grade	Term/Trns
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Electives (All college level courses appearing on your final transcript, **not listed above** that will bring your total semester hours to 120 hours.) (8 semester hours)

Course No	Title	Sem.hrs	Grade	Term/Trns
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

RESTRICTED ELECTIVES:

- CHEM 322 Physical Chemistry II (3)
- CHEM 351 Inorganic Chemistry I (3)
- CHEM 352 Inorganic Chemistry II (3)
- CHEM 396 Topics (1-3)
- CHEM 397 Structured Research (1-3)
- CHEM 421 Advanced Organic Chemistry I (3)
- CHEM 422 Advanced Organic Chemistry II (3)
- CHEM 431/431L Instrumental Analysis and Lab (3) / (1)
- CHEM 487 Formal Research (1-3)
- CHEM 494 Seminar (1)
- CHEM 496 Topics (3)
- CHEM 497 Structured Research (1-3)

- BIOL 310/310L Developmental Biology (3)/(2)
- BIOL 341/341L General Physiology and Lab (3)/(1)
- BIOL 343 Immunology (3)
- BIOL 350/350L Microbiology and Lab (3)/(1)
- BIOL 387 Structured Research (1-3)
- BIOL 403 Evolution (3)
- BIOL 425 Molecular Genetics (3)
- BIOL 441 Endocrinology (3)
- BIOL 442 Pharmacology (3)
- BIOL 487 Advanced Research (1-3)

SUGGESTED COURSE SEQUENCING FOR A MAJOR IN CHEMISTRY, BIOCHEMISTRY CONCENTRATION

This is a recommended sequence of course work. Certain courses may have prerequisites or are offered only 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
CHEM 131	4	CHEM 132	4
CHEM 131L	1	CHEM 132L	1
ENGL 111	3	ENGL 112	3
ESSL	3	BIOL 105	3
ESSL	4	BIOL 105L	1
	15	ESSL	3
			15

SOPHOMORE YEAR

Fall Semester	Hours	Spring Semester	Hours
CHEM 311	4	CHEM 312	4
CHEM 311L	1	CHEM 312L	1
PHYS 131	4	PHYS 132	4
PHYS 131L	1	PHYS 132L	1
MATH 151	5	MATH 152	5
	15		15

JUNIOR YEAR

Fall Semester	Hours	Spring Semester	Hours
CHEM 315	3	CHEM 316	3
CHEM 315L	1	CHEM 301	3
BIOL 302	3	CHEM 301L	1
ESSL	3	BIOL 301	3
ESSL 200	1	BIOL 301L	1
ESSL 290	3	KINE 100	1
	14	KINA 1XX	1
		Elective	2
			15

SENIOR YEAR

Fall Semester	Hours	Spring Semester	Hours
CHEM 321	3	CHEM 341	2
BIOL 371L	3	CHEM 442	1
Restricted Electives	4	ESSL	3
ESSL	3	Restricted Elective	3
ESSL	3	Electives	6
	16		15

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).