2016-2017 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.

The program culminates in two courses designed to bridge students' coursework with their entry into the workforce, a medical degree program, or graduate school. The Advanced Laboratory course helps students to synthesize knowledge from various chemical disciplines and apply it to solving chemical problems in a practical manner. This is similar to the type of process that they are likely to experience after graduation. Our Communicating in the World of Chemistry course couples with our Advanced Laboratory course to help students express themselves in a professional manner while applying for and entering their new positions.

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.

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.

_____ _____ 20_____
Signature of Advisor Date

_____ _____ 20_____
Signature of Department Head Date

_____ _____ 20_____
Signature of Registrar Date

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 "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

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*		

*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) –

History (3 semester hours)
HIST

Fine Arts (3 semester hours)

Course No	Title	Sem.hrs	Grade	Term/Trns

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	General Chemistry	4	CHEM 132	General Chemistry	4
CHEM 131L	General Chemistry Lab	1	CHEM 132L	General Chemistry Lab	1
ENGL 111	English Composition	3	ENGL 112	English Composition	3
ESSL	History	3	BIOL 105	Attributes of Living Systems	3
ESSL	Natural Science with lab	4	BIOL 105L	Attributes of Living Systems Lab	1
		15	ESSL	Social and Behavioral Sciences	3
					15

SOPHOMORE YEAR

Fall Semester		Hours	Spring Semester		Hours
CHEM 311	Organic Chemistry	4	CHEM 312	Organic Chemistry	4
CHEM 311L	Organic Chemistry Lab	1	CHEM 312L	Organic Chemistry Lab	1
PHYS 131	Fundamental Mechanics	4	PHYS 132	Electromagnetism & Optics	4
PHYS 131L	Fundamental Mechanics Lab	1	PHYS 132L	Electromagnetism & Optics Lab	1
MATH 151	Calculus I	5	MATH 152	Calculus II	5
		15			15

JUNIOR YEAR

Fall Semester		Hours	Spring Semester		Hours
CHEM 315	Biochemistry I	3	CHEM 316	Biochemistry II	3
CHEM 315L	Biochemistry I Lab	1	CHEM 301	Analytical Chemistry	3
BIOL 302	Cellular Biology	3	CHEM 301L	Analytical Chemistry Lab	1
ESSL	Natural Science	3	BIOL 301	Principles of Genetics	3
ESSL 200	Essential Speech	1	BIOL 301L	Principles of Genetics Lab	1
ESSL 290	Maverick Milestone	3	KINE 100	Health and Wellness	1
		14	KINA 1XX	Activity	1
			Elective		2
					15

SENIOR YEAR

Fall Semester		Hours	Spring Semester		Hours
CHEM 321	Physical Chemistry I	3	CHEM 341	Advanced Laboratory I	2
BIOL 371L	Lab Investigations Cell Molec. Biology	3	CHEM 442	Chemistry Communication	1
Restricted Electives		4	ESSL	Humanities	3
ESSL	Behavioral Sciences	3	Restricted Elective		3
ESSL	Fine Arts	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).