# 2016-2017 PETITION/PROGRAM SHEET
## Degree: Bachelor of Science
## Major: Chemistry

**About This Major . . .**

Chemistry students gain a unique perspective on the composition, properties, and reactivity of the substances surrounding them. These students gain problem-solving skills that can be applied in chemistry labs, in other classes, and in day-to-day life. By having chemistry faculty with a diverse range of specialties (analytical, inorganic, physical, organic, and biochemistry), chemistry majors have the opportunity to learn about each of these fields, and they are provided with a wide variety of research opportunities. Students are trained to independently use modern instrumentation, including a 300 MHz NMR, a liquid chromatograph, a mass spectrometer, and an ICP atomic emission spectrophotometer. The programs culminates in two courses designed to bridge students' coursework with their entry into the workforce or graduate school. In Advanced Laboratory, students synthesize knowledge from various chemical disciplines and apply it to solving chemical problems in a practical manner. 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 graduates have jobs in the chemical industry and secondary education, and have gone to graduate, pharmacy, and medical schools. Our graduates have completed Ph.D. programs at the University of Denver, Arizona State University, University of Utah and University of Wyoming in chemistry, biomedical engineering and environmental engineering.

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:

- Demonstrate fluency in the concepts from the major fields of chemistry (inorganic, organic, physical, and analytical). (Specialized Knowledge)
- Utilize mathematics to solve chemical problems. (Quantitative Fluency)
- Employ proper experimental techniques. (Applied Learning)
- Interpret chemical information from peer-reviewed publications. (Critical Thinking)
- Communicate chemical topics effectively, both verbally and in writing. (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.

_____ _____ 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).
- Pre-collegiate courses (usually numbered below 100) cannot be used for graduation.
- 2.00 cumulative GPA or higher in all CMU coursework.
- A "C" or higher is required in all major and foundation courses.
- 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** (3 semester hours, must receive a grade of "C" or better, 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)

_____ ____ _____ ____ _____ _____
_____ ____ _____ ____ _____ _____
_____ ___L _____ ____ _____ _____

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

| | | | | |
|---|---|---|---|---|
| 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 REQUIREMENTS** (51semester hours) A "C" or higher is required in all major 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 | _____ | _____ |

Additional Chemistry Courses (17 semester hours)

| | | | | |
|---|---|---|---|---|
| CHEM 321 | Physical Chemistry I | 3 | _____ | _____ |
| CHEM 322 | Physical Chemistry II | 3 | _____ | _____ |
| CHEM 351 | Inorganic Chemistry I | 3 | _____ | _____ |
| CHEM 431 | Instrumental Analysis | 3 | _____ | _____ |
| CHEM 431L | Instrumental Analysis Lab | 1 | _____ | _____ |
| MATH 253 | Calculus III | 4 | _____ | _____ |

**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 or 487:

_____ ____ _____ ____ _____ _____
_____ ____ _____ ____ _____ _____
_____ ____ _____ ____ _____ _____
_____ ____ _____ ____ _____ _____

**ELECTIVES** (All college level courses appearing on your final transcript, **not listed above,** that will bring your total semester hours to 120 hours.) (15 semester hours; 3 hours upper division may be needed.)

| Course | No | Title | Sem.hrs | Grade | Term/Trns |
|---|---|---|---|---|---|
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| Course | No | Title | Sem.hrs | Grade | Term/Trns |
|---|---|---|---|---|---|
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**RESTRICTED ELECTIVES:**

CHEM 300 Environmental Chemistry (4)
CHEM 315/315L Biochemistry and Lab (3) / (1)
CHEM 316 Biochemistry II (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 487 Formal Research (1-3)
CHEM 494 Seminar (1)
CHEM 496 Topics (3)

## SUGGESTED COURSE SEQUENCING FOR A MAJOR IN CHEMISTRY

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 |
|---|---|---|---|---|---|
| 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 |
| MATH 151 | Calculus I | 5 | MATH 152 | Calculus II | 5 |
| ESSL | Natural Science | 3 | ESSL | Natural Science with lab | 4 |
| | | 16 | | | 17 |

### 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 |
| MATH 253 | Calculus III | 4 | PHYS 132 | Electromagnetism & Optics | 4 |
| PHYS 131 | Fundamental Mechanics | 4 | PHYS 132L | Electromagnetism & Optics Lab | 1 |
| PHYS 131L | Fundamental Mechanics Lab | 1 | CHEM 301 | Analytical Chemistry | 3 |
| KINE 100 | Health and Wellness | 1 | CHEM 301L | Analytical Chemistry Lab | 1 |
| | | 15 | | | 14 |

### JUNIOR YEAR

| Fall Semester | | Hours | Spring Semester | | Hours |
|---|---|---|---|---|---|
| CHEM 321 | Physical Chemistry I | 3 | CHEM 322 | Physical Chemistry II | 3 |
| ESSL 200 | Essential Speech | 1 | CHEM 351 | Inorganic Chemistry I | 3 |
| ESSL 290 | Maverick Milestone | 3 | ESSL | Humanities | 3 |
| ESSL | History | 3 | ESSL | Social/Behavioral Science | 3 |
| ESSL | Fine Arts | 3 | Elective | | 3 |
| Elective | | 3 | | | 15 |
| | | 16 | | | |

### SENIOR YEAR

| Fall Semester | | Hours | Spring Semester | | Hours |
|---|---|---|---|---|---|
| CHEM 411 | Instrumental Analysis | 3 | Restricted Electives | | 4 |
| CHEM 411L | Instrumental Analysis Lab | 1 | CHEM 341 | Advanced Laboratory I | 2 |
| ESSL | Social/Behavioral Science | 3 | CHEM 441 | Chemistry Communication | 1 |
| KINA | Activity | 1 | Elective | | 3 |
| Restricted Electives | | 3 | Unrestricted Upper Division Electives | | 3 |
| Elective | | 3 | | | 13 |
| | | 14 | | | |

**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).