



## 2017-2018 PROGRAM REQUIREMENTS

### 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 nuclear magnetic resonance spectrometer liquid chromatograph, a mass spectrometer, and an ICP atomic emission spectrophotometer. The programs culminate 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:

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

#### Advising Process and DegreeWorks

This document is intended for informational purposes to help determine what courses and associated requirements are needed to earn a degree. The suggested course sequencing outlines how students could finish degree requirements. Some courses are critical to complete in specific semesters, while others may be moved around. Meeting with an academic advisor is essential in planning courses and altering the suggested course sequencing. It is ultimately the student's responsibility to understand and fulfill the requirements for her/his intended degree(s).

DegreeWorks is an online degree audit tool available in MAVzone. It is the official record used by the Registrar's Office to evaluate progress towards a degree and determine eligibility for graduation. Students are responsible for reviewing their DegreeWorks audit on a regular basis and should discuss questions or concerns with their advisor or academic department head. Discrepancies in requirements should be reported to the Registrar's Office.

#### Graduation Process

Students must complete the following in the first two months of the semester prior to completing their degree requirements:

- Review their DegreeWorks audit and create a plan that outlines how unmet requirements will be met in the final semester.
- Meet with their advisor and modify their plan as needed. The advisor must approve the final plan.
- Submit the "Intent to Graduate" form to the Registrar's Office to officially declare the intended graduation date and commencement ceremony plans.
- Register for all needed courses and complete all requirements for each degree sought.

Submission deadlines and commencement details can be found at <http://www.coloradomesa.edu/registrar/graduation.html>.

If a student's petition for graduation is denied, it will be her/his responsibility to consult the Registrar's Office regarding next steps.

### **INSTITUTIONAL DEGREE REQUIREMENTS**

The following institutional degree requirements apply to all CMU baccalaureate degrees. Specific programs may have different requirements that must be met in addition to institutional requirements.

- 120 semester hours minimum.
- 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 (an alternative credit limit applies to the Bachelor of Applied Science degree).
- 2.00 cumulative GPA or higher in all CMU coursework.
- A course may only be used to fulfill one requirement for each degree/certificate.
- No more than six semester hours of independent study courses can be used toward the degree.
- Non-traditional credit, such as advanced placement, credit by examination, credit for prior learning, cooperative education and internships, cannot exceed 30 semester credit hours for a baccalaureate degree; A maximum of 15 of the 30 credits may be for cooperative education, internships, and practica.
- Pre-collegiate courses (usually numbered below 100) cannot be used for graduation.
- Capstone exit assessment/projects (e.g., Major Field Achievement Test) requirements are identified under Program-Specific Degree Requirements.
- The Catalog Year determines which program sheet and degree requirements a student must fulfill in order to graduate. Visit with your advisor or academic department to determine which catalog year and program requirements you should follow.
- See "Requirements for Undergraduate Degrees and Certificates" in the catalog for a complete list of graduation requirements.

### **PROGRAM-SPECIFIC DEGREE REQUIREMENTS**

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

### **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.

**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)

**Mathematics** (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)

- Select one Humanities course (3)

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

- Select one Social and Behavioral Sciences course (3)
- Select one Social and Behavioral Sciences course (3)

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

- Select one Natural Sciences course (3)
- Select one Natural Sciences course with a lab (4)

**History** (3 semester hours)

- Select one History course (3)

**Fine Arts** (3 semester hours)

- Select one Fine Arts course (3)

### **OTHER LOWER-DIVISION REQUIREMENTS**

**Wellness Requirement** (2 semester hours)

- KINE 100 - Health and Wellness (1)
- Select one Activity course (1)

**Essential Learning Capstone** (4 semester hours)

Essential Learning Capstone must be taken after completion of the Essential Learning English and Mathematics requirements, and when a student has earned between 45 and 75 hours.

- ESSL 290 - Maverick Milestone (3)
- ESSL 200 - Essential Speech (1)

### **FOUNDATION COURSES** (17 semester hours)

- MATH 151 - Calculus I (2)
- MATH 152 - Calculus II (5)
- One of the following sets of courses:
  - PHYS 131 - Fundamental Mechanics (4) with PHYS 131L - Fundamental Mechanics Laboratory (1)
  - PHYS 111 - General Physics (4) with PHYS 111L - General Physics Laboratory (1)
- One of the following sets of courses:
  - PHYS 132 - Electromagnetism and Optics (4) with PHYS 132L - Electromagnetism and Optics Laboratory (1)
  - PHYS 112 - General Physics (4) with PHYS 112L - General Physics Laboratory (1)

**BS,CHEMISTRY REQUIREMENTS** (51 semester hours, must pass all courses with a grade of "C" or higher)

**Core** (27 semester hours)

- CHEM 131 - General Chemistry (4)
- CHEM 131L - General Chemistry Laboratory (1)
- CHEM 132 - General Chemistry II (4)
- CHEM 132L - General Chemistry II Laboratory (1)
- CHEM 301 - Analytical Chemistry (3)
- CHEM 301L - Analytical Chemistry Laboratory (1)
- CHEM 311 - Organic Chemistry (4)
- CHEM 311L - Organic Chemistry Laboratory (1)
- CHEM 312 - Organic Chemistry II (4)
- CHEM 312L - Organic Chemistry II Laboratory (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 Laboratory (1)
- MATH 253 - Calculus III (4)

**Restricted Electives** (7 semester hours)

Select 7 semester hours from the following list: (no more than 4 semester hours can come from CHEM 397 or 487)

- CHEM 300 - Environmental Chemistry (4)
- CHEM 315 - Biochemistry (3) with CHEM 315L - Biochemistry Laboratory (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)
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**GENERAL 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 of upper division may be needed)

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## SUGGESTED COURSE SEQUENCING

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### Freshman Year, Fall Semester: 16 credits

- CHEM 131 - General Chemistry (4) and CHEM 131L - General Chemistry Laboratory (1)
- ENGL 111 - English Composition (3)
- MATH 151 - Calculus I (5)
- Essential Learning - Natural Science (3)

### Freshman Year, Spring Semester: 17 credits

- CHEM 132 - General Chemistry II (4) and CHEM 132L - General Chemistry II Laboratory (1)
  - ENGL 112 - English Composition (3)
  - MATH 152 - Calculus II (5)
  - Essential Learning - Natural Science with Lab (4)
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### Sophomore Year, Fall Semester: 15 credits

- MATH 253 - Calculus III (4)
- CHEM 311 - Organic Chemistry (4) and CHEM 311L - Organic Chemistry Laboratory (1)
- PHYS 131/PHYS 131L - Fundamental Mechanics (5) or PHYS 111/PHYS 111L - General Physics (5)
- KINE 100 - Health and Wellness (1)

### Sophomore Year, Spring Semester: 14 credits

- CHEM 312 - Organic Chemistry II (4) and CHEM 312L - Organic Chemistry II Laboratory (1)
  - PHYS 132/PHYS 132L - Electromagnetism and Optics (5) or PHYS 112/PHYS 112L - General Physics (5)
  - CHEM 301 - Analytical Chemistry (3) and CHEM 301L - Analytical Chemistry Laboratory (1)
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### Junior Year, Fall Semester: 16 credits

- CHEM 321 - Physical Chemistry I (3)
- ESSL 290 - Maverick Milestone (3)
- ESSL 200 - Essential Speech (1)
- Essential Learning - History (3)
- Essential Learning - Fine Arts (3)
- Elective (3)

### Junior Year, Spring Semester: 15 credits

- CHEM 322 - Physical Chemistry II (3)
  - CHEM 351 - Inorganic Chemistry I (3)
  - Essential Learning - Social and Behavioral Sciences (3)
  - Essential Learning - Humanities (3)
  - Elective (3)
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### Senior Year, Fall Semester: 14 credits

- CHEM 431 - Instrumental Analysis (3) and CHEM 431L - Instrumental Analysis Laboratory (1)
- Essential Learning - Social and Behavioral Sciences (3)
- KINA Activity (1)
- Restricted Elective (3)
- Elective (3)

### Senior Year, Spring Semester: 13 credits

- CHEM 341 - Advanced Laboratory I (2)
  - CHEM 442 - Communication in Chemistry (1)
  - Restricted Electives (4)
  - Electives (2 courses) (6)
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