



**2017-2018 PROGRAM REQUIREMENTS**  
**Degree: Bachelor of Science**  
**Major: Mathematics**  
**Concentration: Applied Mathematics**

**About This Major . . .**

Applied mathematicians use mathematics to solve problems. This program provides mathematics coursework commonly found in applied math settings. Applied mathematics graduates can choose to find work in a variety of areas, or may choose to continue their educations by attending graduate school in areas such as applied mathematics, computer science and engineering. For more information on what you can do with this major, go to <http://www.coloradomesa.edu/career/whatmajor.html> and <https://www.siam.org/careers/thinking.php>.

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. Use methods of applied mathematics to model and solve applied problems (Specialized Knowledge/Applied Learning/Quantitative Fluency)
2. Use mathematical software (including calculators) to aid in problem-solving and investigation, and understand its limitations. (Applied Learning)
3. Prove propositions deductively from definitions and theorems, using clear and precise prose. (Critical Thinking)
4. Demonstrate comprehension of applied mathematics and deliver a substantial written and oral presentation in an area of applied mathematics. (Specialized Knowledge/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**

- 2.50 cumulative GPA or higher in coursework toward the major content area
- At most one "D" may be used in completing major requirements.

### **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 elective 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** (8 semester hours)

- MATH 152 - Calculus II (5)
- STAT 200 - Probability and Statistics (3)

**BS, MATHEMATICS REQUIREMENTS** (40-43 semester hours)

A 2.5 GPA is required in the major courses. At most one "D" may be used in completing major requirements.

**Core** (18 semester hours)

- MATH 150 - Topics and Careers in Math (1)
- MATH 225 - Computational Linear Algebra (2)
- MATH 240 - Intro to Advanced Mathematics (4)
- MATH 253 - Calculus III (4)
- MATH 325 - Linear Algebra (3)
- MATH 484 - Senior Seminar I (2)
- MATH 494 - Senior Seminar II (2)

**Required Courses** (23-25 semester hours)

- One of the following courses:
  - CSCI 110 - Beginning Programming (3) with CSCI 110L - Beginning Programming Laboratory (1)
  - CSCI 111- Computer Science 1: Foundations (4)
- CSCI 130 - Introduction to Engineering Computer Science (3)
- CSCI 310 - Advanced Programming (1-3)
- MATH 260 - Differential Equations (3)
- MATH 360 - Methods of Applied Mathematics (3)
- MATH 365 - Mathematical Modeling (3)
- MATH 366 - Methods of Applied Mathematics II (3)
- MATH 466 - Methods of Applied Mathematics III (3)

**Concentration Electives** (9-10 semester hours)

Select one of the following courses:

- STAT 311 - Statistical Methods (3)
- STAT 412 - Correlation and Regression (3)
- STAT 425 - Design and Analysis of Experiments (3)

Select one of the following courses:

- MATH 361 - Numerical Analysis (4)
- MATH 362 - Fourier Analysis (3)
- MATH 369 - Discrete Structures I (3)
- CSCI 380 - Operations Research (3)

Select one of the following courses:

- MATH 450 - Complex Variables (3)
- MATH 452 - Introduction to Real Analysis I (3)
- MATH 460 - Advanced Linear Algebra (3)
- PHYS 471 - Computational Physics I (3)

**GENERAL ELECTIVES** (All college level courses appearing on your final transcript, not listed above that will bring your total semester hours to 120 hours. 22-25 semester hours; 8-11 hours of upper division may be needed)

- MATH 151 - Calculus I (2)
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## SUGGESTED COURSE SEQUENCING

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### Freshman Year, Fall Semester: 16 credits

- MATH 151 - Calculus I (5)
- ENGL 111 - English Composition (3)
- KINA Activity (1)
- KINE 100 - Health and Wellness (1)
- Essential Learning - Natural Science (3)
- Essential Learning - Social and Behavioral Sciences (3)

### Freshman Year, Spring Semester: 16 credits

- MATH 152 - Calculus II (5)
  - ENGL 112 - English Composition (3)
  - MATH 150 - Topics and Careers in Math (1)
  - CSCI 111 - Computer Science 1: Foundations (4) or CSCI 110/CSCI 110L - Beginning Programming and Laboratory (4)
  - Essential Learning - Social and Behavioral Sciences (3)
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### Sophomore Year, Fall Semester: 16 credits

- MATH 240 - Intro to Advanced Mathematics (4)
- MATH 225 - Computational Linear Algebra (2)
- MATH 253 - Calculus III (4)
- Essential Learning - Fine Arts (3)
- Essential Learning - History (3)

### Sophomore Year, Spring Semester: 16 credits

- MATH 260 - Differential Equations (3)
  - MATH 325 - Linear Algebra (3)
  - STAT 200 - Probability and Statistics (3)
  - CSCI 130 - Introduction to Engineering Computer Science (3)
  - Essential Learning - Natural Science with Lab (4)
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### Junior Year, Fall Semester: 14-16 credits

- MATH 360 - Methods of Applied Math (3)
- ESSL 290 - Maverick Milestone (3)
- ESSL 200 - Essential Speech (1)
- CSCI 310 - Advanced Programming (1-3)
- Concentration Elective (3)
- Essential Learning - Humanities (3)

### Junior Year, Spring Semester: 15-16 credits

- MATH 366 - Methods of Applied Math II (3)
  - MATH 365 - Mathematical Modeling (3)
  - Concentration Elective (3-4)
  - Electives (6)
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### Senior Year, Fall Semester: 14 credits

- MATH 466 - Methods of Applied Math III (3)
- MATH 484 - Senior Seminar I (2)
- Concentration Elective (3)
- Electives (6)

### Senior Year, Spring Semester: 10-13 credits

- MATH 494 - Senior Seminar II (2)
  - Electives (8-11)
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