

EDUCATION: SECONDARY EDUCATION, MATHEMATICS (BS)

Degree: Bachelor of Science
Major: Mathematics
Concentration: Secondary Education
Program Code: 3430

About This Major . . .

The major in mathematics with a concentration in secondary education will prepare students to teach in both middle schools and in high schools.

While completing this degree, students develop problem-solving and critical thinking skills and are introduced to the logical and historical development of mathematical ideas. Students also learn the professional skills in teaching methods and content necessary for secondary mathematics teachers. Nationally recommended curriculum guidelines are followed in order to ensure that graduates have the mathematical content and conceptual understanding necessary for all high school mathematics courses. Graduates from this program are in great demand both locally and statewide with the scarcity of

Important information for this program:

- 2.80 cumulative GPA or higher required in all CMU coursework.
- 2.80 cumulative GPA or higher required in coursework toward the major content area.
- All EDUC prefix courses must be completed with a grade of "B" or better.
- Students must pass the PRAXIS II exam in the content area prior to beginning the internship. Also, all other coursework toward the degree must be successfully completed prior to the internship.
- A grade of "C" or better must be earned in all required courses, unless otherwise stated.

For more information on what you can do with this major, visit Career Services' [What to Do with a Major?](#) resource and the [Mathematics](#) website.

All CMU baccalaureate graduates are expected to demonstrate proficiency in specialized knowledge/applied learning, quantitative fluency, communication fluency, critical thinking, personal and social responsibility, and information literacy. In addition to these campus-wide student learning outcomes, graduates of this major will be able to:

- a. Mathematics Outcome 1: Construct multi-step problem solving strategies and communicate solutions effectively in written form. (Specialized Knowledge, Quantitative Fluency)
- b. Mathematics Outcome 2: Use mathematical software (including calculators) to aid in problem-solving and investigation, and recognize its limitations. (Applied Learning)
- c. Mathematics Outcome 3: Prove propositions deductively from definitions and theorems in clear and precise prose. (Critical Thinking)
- d. Mathematics Outcome 4: Investigate, discuss, and respond to ethical and social challenges in a mathematical context. (Communication Fluency, Personal and Social Responsibility, Information Literacy)

- e. Mathematics Outcome 5: Demonstrate familiarity with the logical and historical development of mathematics and the implications of this development. (Specialized Knowledge)
- f. Mathematics Outcome 6: Research a topic in mathematics education and deliver written and oral presentations. (Specialized Knowledge, Communication Fluency, Information Literacy)
- g. Teacher Education Outcome 1: Demonstrate mastery of major area's content knowledge and pedagogical strategies through fieldwork with learners in professional settings. (Specialized Knowledge/Applied Learning)
- h. Teacher Education Outcome 2: Design and establish a safe, inclusive, and respectful learning environment for a diverse population of students. (Specialized Knowledge/Applied Learning)
- i. Teacher Education Outcome 3: Plan and deliver effective instruction to students, based on research-based pedagogical practices. (Communication Literacy/Information Literacy)
- j. Teacher Education Outcome 4: Collect and analyze student assessment data and use results to inform planning and instruction. (Quantitative Fluency)
- k. Teacher Education Outcome 5: Demonstrate professionalism through ethical conduct, reflection, and leadership. (Personal and Social Responsibility)

Requirements

Each section below contains details about the requirements for this program. Select a header to expand the information/requirements for that particular section of the program's requirements.

To print or save an overview of this program's information, including the program description, learning outcomes, requirements, suggested course sequencing (if applicable), and advising and graduation information, scroll to the bottom of the left-hand navigation menu and select "Print Options." This will give you the options to either "Send Page to Printer" or "Download PDF of This Page." The "Download PDF of This Page" option prepares a much more concise presentation of all program information. The PDF is also printable and may be preferable due to its brevity.

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.

Specific to this degree:

- 2.80 cumulative GPA or higher required in all CMU coursework.

Essential Learning Requirements

(31 semester hours, must pass all courses with a grade of "C" or higher, unless otherwise noted.)

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.

Code	Title	Semester Credit Hours
English ¹		
ENGL 111	English Composition I-GTCO1	3
ENGL 112	English Composition II-GTCO2	3
Mathematics ²		
MATH 119	Precalculus Mathematics-GTMA1 (or higher) ^{3,4}	3
History		
Select one History course		3
Humanities		
Select one Humanities course		3
Social and Behavioral Sciences		
PSYC 233	Human Growth and Development-GTSS3 ⁵	3
Select one Social and Behavioral Sciences course ⁶		3
Fine Arts		
Select one Fine Arts course		3
Natural Sciences ⁷		
Select one Natural Science course with lab		4
Select one Natural Science course		3
Total Semester Credit Hours		31

¹ Must receive a grade of "B" or better and must be completed by the time the student has 60 semester hours.

² Must receive a grade of "C" or better, must be completed by the time the student has 60 semester hours.

³ MATH 119 is a 5 semester credit hour course. 3 credits apply to the Essential Learning requirements and 2 credits apply to elective credit.

⁴ May also satisfy this requirement by completing both MATH 119A: Algebra for Calculus (4 credits) and MATH 119B: Trigonometry for Calculus (3 credits).

⁵ Must receive a grade of "B" or higher.

⁶ GEOG 103 - World Regional Geography (3) recommended.

⁷ One course must include a lab.

Other Lower Division Requirements

Must pass all courses with a grade of "C" or higher, unless otherwise noted.

Code	Title	Semester Credit Hours
Wellness Requirement		
KINE 100	Health and Wellness	1
Select one Activity course		1
Essential Learning Capstone ¹		
ESSL 290	Maverick Milestone	3
ESSL 200	Essential Speech	1
Total Semester Credit Hours		6

¹ 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.

Foundation Courses

(8 semester hours, must pass all courses with a grade of "C" or higher.)

Code	Title	Semester Credit Hours
MATH 151	Calculus I-GT-MA1	5
STAT 200	Probability and Statistics-GTMA1	3
Total Semester Credit Hours		8

Program Specific Degree Requirements

(43-44 semester hours, must pass all courses with a grade of "C" or higher, excepting one "D", at most, which may be used in completing the major requirements. Must also maintain a 2.80 cumulative GPA or higher in coursework toward the major content area.)

- Students must take the PRAXIS II exam in the content area prior to beginning the internship. Also, all other coursework toward the degree must be successfully completed prior to the internship.

Code	Title	Semester Credit Hours
Core Courses		
MATH 150	Topics and Careers in Mathematics	1
MATH 152	Calculus II	5
MATH 225	Computational Linear Algebra	3
MATH 253	Calculus III	4
MATH 492	Senior Capstone	3
Select one of the following:		4
CSCI 111	CS1: Foundations of Computer Science	
CSCI 110 & 110L	Beginning Programming and Beginning Programming Laboratory	
CSCI 130	Introduction to Engineering Computer Science	
Concentration Courses		

MATH 240	Introduction to Advanced Mathematics	4
MATH 310	Number Theory	3
MATH 352	Advanced Calculus	3
MATH 369	Discrete Structures I	3
MATH 380	History of Mathematics	3
MATH 386	Geometries	4

Concentration Electives

Select one of the following: 3-4

MATH 361	Numerical Analysis	
MATH 365	Mathematical Modeling	
MATH 450	Complex Variables	
MATH 490	Abstract Algebra I	
STAT 301	Computational Statistics	

Total Semester Credit Hours 43-44**Secondary Education Requirements**

(29 semester hours, all EDUC prefix courses must be completed with a grade of "B" or better.)

Program Requirements:

ENGL 111, ENGL 112, PSYC 233, EDUC 115 and EDUC 215 (all with a grade of B or better) and formal acceptance to the Teacher Education Program.

Code	Title	Semester Credit Hours
EDUC 115	What It Means To Be An Educator (8 field experience hours)	1
EDUC 215	Teaching as a Profession (12 field experience hours)	1
EDUC 342	Pedagogy and Assessment: Secondary and K-12 (20 field experience hours)	3
EDUC 343	Teaching to Diversity (20 field experience hours)	3
EDUC 442	Integrating Literacy Across the Curriculum: Secondary and K-12 Art (60 field experience hours)	3
EDUC 475	Classroom Management for K-12 Educators	1
EDUC 497	Content Methodology Practicum (80 field experience hours)	3
EDUC 497C	Methods of Teaching Secondary Mathematics ¹	2
EDUC 499G	Teaching Internship and Colloquia: Secondary (600 12 field experience hours)	12
Praxis II Exam Passed		
Total Semester Credit Hours		29

¹ This course is only offered in the fall semester. It may be taken with either the 300-level or 400-level EDUC courses but must be taken before the student teaching semester.**General Electives**

All college level courses appearing on your final transcript, not listed above that will bring your total semester hours to 120 hours. 2-3 semester hours. Must earn a grade of "C" or higher.

Code	Title	Semester Credit Hours
MATH 119	Precalculus Mathematics-GTMA1	2
Select additional elective(s)		0-1
Total Semester Credit Hours		2-3

Suggested Course Plan

While the sequencing below culminates in a total of 119-121 semester credit hours, students must complete a minimum of 120 semester credit hours as required for completion of this degree, including satisfactory completion of all required courses. Plan to complete requirements with varying hour options accordingly.

First Year		Semester Credit Hours
Fall Semester		
MATH 119	Precalculus Mathematics-GTMA1	5
ENGL 111	English Composition I-GTC01	3
Essential Learning - Humanities		3
Essential Learning - Fine Arts		3
KINA Activity		1
Semester Credit Hours		15

Spring Semester		Semester Credit Hours
MATH 151	Calculus I-GTMA1	5
MATH 150	Topics and Careers in Mathematics	1
ENGL 112	English Composition II-GTC02	3
Essential Learning - Social/Behavioral Science		3
Essential Learning - History		3
KINE 100	Health and Wellness	1
Semester Credit Hours		16

Second Year		Semester Credit Hours
Fall Semester		
EDUC 115	What It Means To Be An Educator	1
Essential Learning - Natural Science		3
MATH 152	Calculus II	5
PSYC 233	Human Growth and Development-GTSS3	3
STAT 200	Probability and Statistics-GTMA1	3
Semester Credit Hours		15

Spring Semester		Semester Credit Hours
EDUC 215	Teaching as a Profession	1
Essential Learning - Natural Science with Lab		4
MATH 225	Computational Linear Algebra	3
MATH 253	Calculus III	4
MATH 240	Introduction to Advanced Mathematics	4
Semester Credit Hours		16

Third Year		Semester Credit Hours
Fall Semester		
Select one of the following:		4
CSCI 111	CS1: Foundations of Computer Science	
CSCI 110 & 110L	Beginning Programming and Beginning Programming Laboratory	
CSCI 130	Introduction to Engineering Computer Science	
MATH 310	Number Theory	3
MATH 369	Discrete Structures I (or Concentration Elective at 3-4 hours)	3-4
MATH 380	History of Mathematics	3
ESSL 200	Essential Speech	1
ESSL 290	Maverick Milestone	3
Semester Credit Hours		17-18

Spring Semester		
EDUC 342	Pedagogy and Assessment: Secondary and K-12	3
EDUC 343	Teaching to Diversity	3
MATH 352	Advanced Calculus	3
MATH 369	Discrete Structures I (or Concentration Elective at 3-4 hours)	3-4
MATH 386	Geometries	4
Semester Credit Hours		16-17
Fourth Year		
Fall Semester		
EDUC 442	Integrating Literacy Across the Curriculum: Secondary and K-12 Art	3
EDUC 475	Classroom Management for K-12 Educators	1
EDUC 497	Content Methodology Practicum	3
EDUC 497C	Methods of Teaching Secondary Mathematics	2
MATH 492	Senior Capstone	3
Semester Credit Hours		12
Spring Semester		
EDUC 499G	Teaching Internship and Colloquia: Secondary	12
Semester Credit Hours		12
Total Semester Credit Hours		119-121

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

Advising and Graduation

Advising Process and DegreeWorks

Documentation on the pages related to this program 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>.