MATHEMATICS B.A. - PURE MATHEMATICS

This degree concentration differs from the BA in Mathematics without a concentration only in the Concentration Requirements.

General Graduate Program Requirements

Graduate School policies and standards can be found on the Graduate School Policies page (https://catalog.umt.edu/graduate/school-policies/).

The minimum GPA for any graduate program is 3.0. Individual programs may require more than a 3.0 to remain in good standing.

The minimum grade for a course to be accepted toward any master's or doctoral requirement is C. The minimum grade for a course to be accepted toward a certificate program is B-. Individual programs may require higher grades for specific courses.

Bachelor of Arts - Mathematics; Pure Mathematics Concentration

Credit Requirements

The major specific credits are much lower for double-majors and for students completing a minor in another subject:

- 44 credits for students completing a second major, and
- 47 credits for students completing a minor.

GPA requirement

- A cumulative GPA of 2.0 is required for all courses used to fulfill major requirements.
- In addition, a cumulative GPA of 2.0 is required for all mathematical sciences courses used to fulfill major requirements. (Mathematical sciences courses are those with a prefix of M or STAT.)

Course Requirements

Code	Title	Hours
Core Courses		
Complete all of the following courses:		
M 171	Calculus I	4
or M 181	Honors Calculus I	
M 172	Calculus II	4
or M 182	Honors Calculus II	
M 210	Introduction to Mathematical Software	3
M 221	Introduction to Linear Algebra	4
M 273	Multivariable Calculus	4
M 300	Undergraduate Mathematics Seminar	1
M 307	Introduction to Abstract Mathematics	3
Electives [1]		
Complete 18-23 credits (6-7 courses) of the following courses. At least three courses must be at the 400 level. See note below about the elective credit requirement.		18-23
M 274	Introduction to Differential Equations	
M 301	Teaching Mathematics with Technology	
M 325	Discrete Mathematics	
M 326	Number Theory	
M 361	Discrete Optimization	
M 362	Linear Optimization	
M 381	Advanced Calculus I	
M 412	Partial Differential Equations	
M 414	Deterministic Models	
M 429	History of Mathematics [2]	
M 431	Abstract Algebra I	
M 432	Abstract Algebra II	
M 439	Euclidean and NonEuclidean Geometry	
M 440	Numerical Analysis	
M 445	Statistical, Dynamical, and Computational Modeling	
M 461	Data Science Analytics	
M 462	Theoretical Basics of Big Data Analytics and Real Time Computation Algorithms	
M 472	Introduction to Complex Analysis	
M 473	Introduction to Real Analysis	
M 485	Graph Theory	
STAT 342	Probability and Simulation	
STAT 421	Probability Theory	
STAT 422	Mathematical Statistics	
STAT 452	Statistical Methods II	
Science Requirement [3]		
Complete 18 credits in at most 3 areas selected from astronomy (ASTR), biology (BIO*), chemistry (CHMY), computer science (CSCI, except CSCI TR*), economics (ECNS), forestry (FORS, WILD), geosciences (GEO), management information systems (BMIS), and physics (PHSX).		18
Language/Computer Science Requirement [4]		
Complete either the General Education Language Requirement or complete one of the following courses:		3
CSCI 150	Introduction to Computer Science	
CSCI 151	Interdisciplinary Computer Science I	
CSCI 152	Interdisciplinary Computer Science II	
Pure Mathematics Concentration		
These courses count toward the mathematics electives requirement		
Complete four of the following courses:		
M 381	Advanced Calculus I	
M 431	Abstract Algebra I	
M 432	Abstract Algebra II	
M 472	Introduction to Complex Analysis	
M 473	Introduction to Real Analysis	
Total Hours		**62-67**

1 Students completing a second major need take only 18 credits. Students completing a minor in another subject need take only 20 credits. All other students must complete 23 credits and 7 courses. At least 4 of the courses in this category must be taken at UM-Missoula (only 3 if M 307 is taken at UM-Missoula).

2 M 429 is also an advanced college writing course. Most Mathematics majors use M 429 to meet the advanced college writing general education requirement.

[3] Students completing a minor in another subject or a second major are exempt from this requirement. Transfer courses listed on the transcript as CSCI TR* may include course work in other areas such as Computer Applications (CAPP) and therefore do not count towards this requirement unless a student successfully petitions the Department of Mathematical Sciences.

[4] Students completing a second major are exempt from this requirement.

Code	Title	Hours
Elective Computer Labs and Independent Study Courses		
Computer labs and independent study courses from the following list are optional; if taken (0-2 credits), they count toward the total number of credits required for the Mathematics Elective requirement.		
M 363	Linear Optimization Laboratory	
M 392	Independent Study	
M 492	Independent Study	
STAT 457	Computer Data Analysis I	
STAT 458	Computer Data Analysis II	