MATHEMATICS B.A. - STATISTICS AND DATA SCIENCE

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

General Degree Requirements

To earn a baccalaureate degree, all students must complete successfully, in addition to any other requirements, the University of Montana General Education Requirements. Please refer to the General Education Requirements page (https://catalog.umt.edu/academics/general-education-requirements/) for more information.

Additional requirements for graduation can be found on the Degree/Certificate Requirements for Graduation page (https://catalog.umt.edu/academics/graduation-requirements/).

Unless otherwise noted in individual program requirements, a minimum grade point average of 2.00 in all work attempted at the University of Montana-Missoula is required for graduation. Please see the Academic Policies and Procedures page (https://catalog.umt.edu/academics/policies-procedures/) for information on how your GPA is calculated.

Courses taken to satisfy the requirements of a major, minor, or certificate program must be completed with a grade of C- or better unless a higher grade is noted in the program requirements.

Bachelor of Arts - Mathematics; Statistics Concentration

Credit Requirements

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

- 41 credits for students completing a second major, and
- 46 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 or M 181	Calculus I	4
M 172 or M 182	Calculus II	4
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		
M 326	Number Theory	
M 361	Discrete Optimization	
M 362	Linear Optimization	
M 381	Advanced Calculus	
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		
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	
Statistics and Data Science Concentration		
These courses count toward the mathematics electives requirement		
Complete four of the following courses: [5]		
M 461	Data Science Analytics	
M 462	Theoretical Basics of Big Data Analytics and Real Time Computation Algorithms	
STAT 342	Probability and Simulation	
STAT 421	Probability Theory	
STAT 422	Mathematical Statistics	

STAT 452	Statistical Methods II	
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.

5 Additional mathematics and statistics courses chosen with advisor.

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	