



**Department of Mathematics and Statistics**  
**Major in Mathematics with a Concentration in Applied Mathematics**  
 Effective Fall 2023

**Purposes of the Major**

The Department of Mathematics and Statistics offers a major in Mathematical Sciences with a concentration in **Applied Mathematics**. The goals of this program are to provide students with

- broad-based and coherent preparation in the various disciplines that constitute the mathematical sciences and
- the specialized training necessary to begin a career in applied mathematics used by engineering and other technically based companies.

This concentration also prepares students for continued study of the mathematical sciences at the graduate level.

The department also offers a **minor** in Mathematics.

**Advising Information**

This document, **Major Requirements**, summarizes the departmental course requirements for graduating with a Bachelor of Science degree in mathematics with applied mathematics concentration. Consult the College Catalog for other graduation requirements, including the required **minor**.

You are strongly encouraged to talk to one or more of the **faculty advisors** in the area of applied mathematics (listed below) as you plan your academic program.

Further information about current course offerings, as well as email addresses and office hours for faculty advisors, is available through the Department's Web site at

<https://msudenver.edu/math>

**Faculty Advisors in Mathematics with Applied Concentration**

Dr. Henc Bouwmeester	SI 3016	303-615-0758	hbouwmee@msudenver.edu
Dr. Brendan Fry	SI 1054	303-615-0729	bfry2@msudenver.edu
Dr. Chris Harder	SI 3028	303-615-0748	harderc@msudenver.edu
Dr. Rob Niemeyer	SI 1036	303-605-7192	niemeye1@msudenver.edu
Dr. Shelley Poole	SI 3034	303-615-0756	srohde2@msudenver.edu
Dr. David Ruch	SI 1041	303-615-0736	ruch@msudenver.edu
Dr. Linda Sundbye	SI 3022	303-615-0746	sundbye1@msudenver.edu

**Declaring a Major**

To declare a major in mathematics with concentration in applied mathematics, visit the Department of Mathematics and Statistics in SI 1022, or call (303) 615-0299. You should declare your major/concentration at least by the time you have finished the core requirements (listed below), and you absolutely must do this by the time you have completed 60 credit hours toward the degree.

**Requirements for the Major <sup>1</sup>**

<b>Core Mathematics Courses</b>	<b>Semester Hours</b>
MTH 1410 Calculus I.....	4
MTH 2410 Calculus II .....	4
MTH 2420 Calculus III.....	4
MTH 3100 Introduction to Mathematical Proofs.....	3

**Required Mathematics Courses**

MTH 3140 Linear Algebra*.....	4
MTH 3210 Probability and Statistics .....	4
MTH 3420 Differential Equations.....	4
MTH 4480 Numerical Analysis I (Senior Experience)...	4

One course selected from:

CS 1050 Computer Science 1.....	4
MTH 2520 R Programming .....	4
MTH 2540 Scientific Computing with Python....	4

**One of the following Tracks:**

**Career Track**

MTH 3430 Mathematical Modeling.....	4
MTH 4490 Numerical Analysis II.....	4

**Graduate School Track**

MTH 4410 Real Analysis I.....	4
MTH 4440 Partial Differential Equations.....	4
MTH 3450 Complex Variables.....	4

**Additional hours from the following for a total of 45 hours:**

MTH 3220 Statistical Methods .....	4
MTH 3230 Stochastic Processes.....	4
MTH 3400 Chaos and Nonlinear Dynamics .....	4
MTH 3430 Mathematical Modeling.....	4
MTH 3450 Complex Variables .....	4
MTH 4210 Probability Theory .....	4
MTH 4410 Real Analysis I**.....	4
MTH 4420 Real Analysis II .....	3
MTH 4440 Partial Differential Equations .....	4
MTH 4490 Numerical Analysis II .....	4

**Total hours required** ..... 45

<sup>1</sup> A grade of "C-" or better is required in each course included in the major.

\* MTH 3130 and one of the following (MTH 3110 or MTH 3650 or MTH 4110 or MTH 4150 or MTH 4410 or MTH 4660) may substitute for MTH 3140. If MTH 4410 is used for this substitution, it can also be used in the other categories.

\*\* Students who are considering graduate school in mathematics are strongly encouraged to take this course.

## General Advising Guidelines

The suggestions below will help you complete your course of study in a timely manner. You should make every effort to follow them:

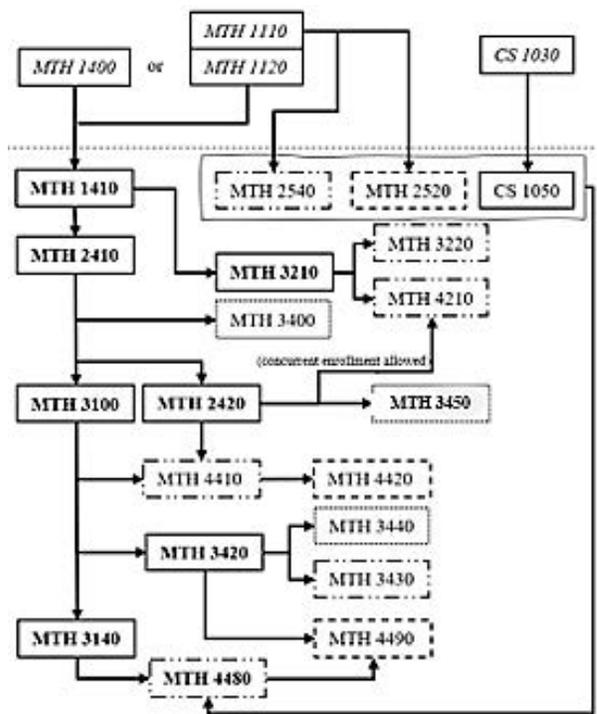
- Note that many mathematics courses are not offered every semester. Also note that, in the semesters in which they are offered, a course may only be offered during the day or in the evening. Course rotations can be found at <https://www.msudenver.edu/math/>
- Complete the core mathematics courses and courses needed to satisfy the General Studies requirements as quickly as possible.
- Declare the major/concentration by the time you complete the core courses.
- Plan your sequence of courses with prerequisites in mind. Note that MTH 3100 is a prerequisite for most upper-division courses.
- Take no more than two upper-division mathematics courses in the same semester. To do otherwise may jeopardize your grades and content understanding.

## Requirements for Transfer Students

- In order for mathematics courses from another institution to satisfy a requirement for the major, the content must match, not just the name of the course.
- You must meet all the requirements for the program based on all courses taken both at other institutions and at MSU Denver.
- You must take at least eight hours of upper-division mathematics courses at MSU Denver.
- The last 12 hours of coursework toward the degree must be taken at MSU Denver unless you have taken at least 45 hours of coursework at MSU Denver.

## Prerequisite Chart for Courses in the Applied Mathematics Concentration

- *Italicized courses* are prerequisites that do not count towards the major.
- **Boldface courses** are required for the major.
- Plain text courses are electives.
- Dotted boxes indicate courses offered every two years.
- Dashed boxes indicate courses offered Spring Only.
- Dot-dashed boxes indicate courses offered Fall Only.
- Lined boxes indicate courses offered Spring & Fall.



If you would like additional information on this program or other programs offered by the Department of Mathematics and Statistics, please visit the Department's Web site at: <https://msudenver.edu/math>

Or write or call:  
Metropolitan State University of Denver  
Department of Mathematics and Statistics  
P.O. Box 173362, Campus Box 38  
Denver, Colorado 80217-3362  
(303) 615-0299 | mathdepartment@msudenver.edu