Department of Mathematics and Statistics
Major in Mathematics with a Concentration in Theoretical Mathematics
Effective Fall 2024

Purposes of the Major

The Department of Mathematics and Statistics offers a major in Mathematical Sciences with a concentration in **Theoretical Mathematics**. The goals of this program are to provide students with direct links to course work at the graduate level. The program concentrates on abstract concepts in mathematics.

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 theoretical mathematics concentration.

You are strongly encouraged to talk to one or more of the **faculty advisors** in the area of theoretical 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 Theoretical Mathematics

Dr. Diane Davis	SI 1064	303-615-0730	ddavi102@msudenver.edu
Dr. Ben Dyhr	SI 3017	303-615-0749	bdhyhr@msudenver.edu
Dr. John Ethier	SI 3017	303-615-0739	jethier@msudenver.edu
Dr. Mona Mocanasu	SI 3023	303-615-0747	mmocanas@msudenver.edu
Dr. Rob Niemeyer	SI 1036	303-605-7192	niemeye1@msudenver.edu
Dr. Linda Sundbye	SI 3022	303-615-0746	sundbyel@msudenver.edu

Declaring a Major

To declare a major in mathematics with concentration in theoretical 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 definitely should do this by the time you have completed 60 credit hours toward the degree.

Requirements for the Major [1]

Core Mathematics Courses
Semester Hours

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 3110	Abstract Algebra I	4
MTH 3140[2]	Linear Algebra	4
MTH 4410	Real Analysis I (Senior Experience)	4

MTH 4420	Real Analysis II	3
Or		
MTH 4110	Abstract Algebra II	3

Two of the following courses:

MTH 3450 Complex Variables	4
MTH 4110 Abstract Algebra II	3
MTH 4150 Elementary Number Theory	3
MTH 4420 Real Analysis II	3
MTH 4660 Intro to Topology	3

One of the following courses:

MTH 2540 Scientific Computing with Python	4
MTH 2520 R Programming	4
MTH 3510 SAS Programming	4
CS 1050 Computer Science 1	4

Total hours required 40-41

[1] A grade of "C-" or better is required in each course included in the major.

[2] MTH 3130 and one of the following (MTH 3640 or MTH 3650 or MTH 4150) may substitute for MTH 3140.

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://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.
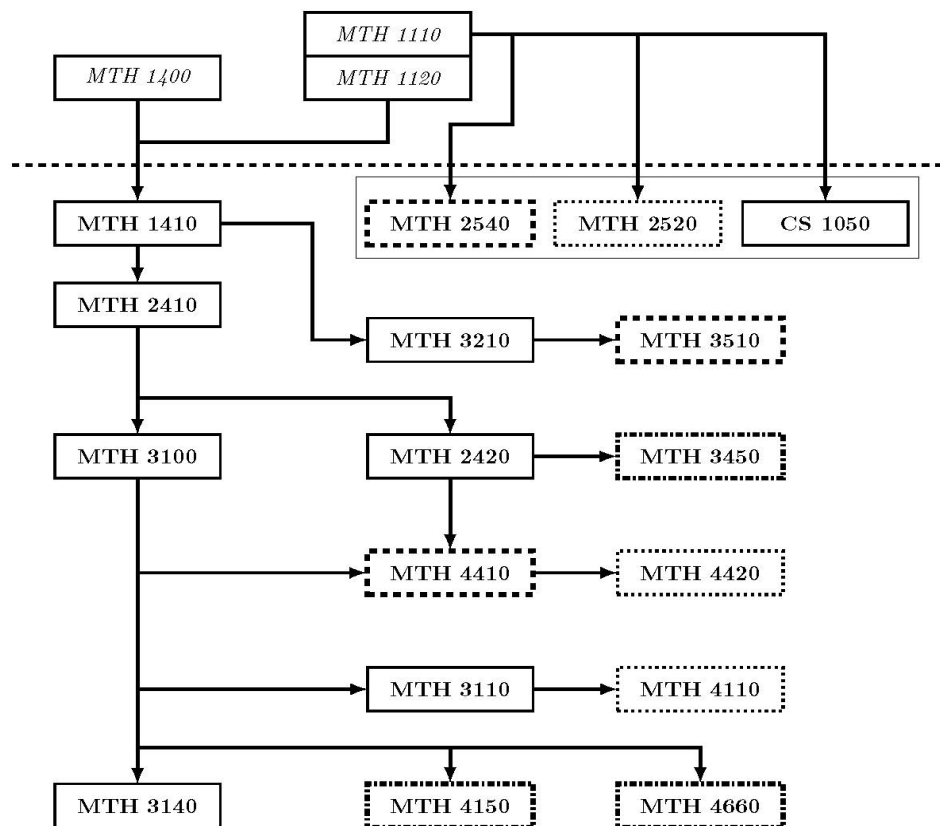
Requirements for Transfer Students

- 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 Theoretical Mathematics Concentration

- *Italicized courses* are prerequisites that do not count towards the major.
- The flowchart shows required courses and all possible electives.

- Lines boxes indicate courses offered Spring & Fall
- Dashed boxes indicate courses offered Fall Only
- Dotted boxes indicate courses offered Spring Only
- Dot-dash boxes indicate courses offered every 2 years

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