

A great option for students double-majoring in **Statistics** or **Data Science!**

The **Mathematical Sciences Program** is designed to provide broad training in basic mathematics together with some specialization in an area of application of mathematics. Each student must select one of the eight Program Options as a special area. Because the program options have somewhat more specific requirements, careful planning and frequent consultation with your advisor are essential to ensure timely completion of the program. The concentration program must include at least nine courses: four basic courses (II.), three courses from one of the Program Options (III.), and two additional courses (IV.) as described below. At least two of the five (optional and additional) courses must be MATH courses.

I. Prerequisites (3-7 courses) {must be completed with C- or better}**

Instructions	Course(s)	Student Elections (enter your course selections here)
Select one of the following course pairs:	Math 215 & 217 Math 285 & 217 Math 205 & 217 Math 295 & 296	1. _____ 2. _____
EECS 183 or working knowledge of a high-level computer language (Fortran, C, or C++)	EECS 183 or working knowledge of a high-level computer language (Fortran, C, or C++) <small>*Students are encouraged to take EECS 280 and EECS 281 as well.</small>	3. _____

II. Basic Courses (4 courses) {must be completed with C- or better}**

Instructions	Course(s)	Student Elections (enter your course selections here)
Select one of the following Differential Equations courses:	Math 316 Math 286	1. _____
Select one of the following Discrete Math/Modern Algebra courses:	Math 312 Math 465 Math 412 Math 493	2. _____
Select one of the following Analysis courses:	Math 351 Math 354 Math 451 Math 450 Math 454	3. _____
Select one of the following Probability courses:	Math 425 Math 525	4. _____

** More advanced students, such as those who have completed Math 396, may substitute higher-level courses with the approval of a concentration advisor. All students are strongly encouraged to include in their program one of the more theoretical courses: Math 412, 451, 493, 494, or 525.

III. Program Options: Probabilistic Methods (3 courses)

A student in the **Mathematical Sciences Program** must choose one of the eight options and complete at least three courses listed under that option. This requirement is designed to provide focus and depth to the program and can only be waived by a departmental advisor in favor of a program that provides this depth in some equivalent way. An acceptable program must include some of the more difficult courses. Advice should be sought from a departmental advisor before selecting an option.

Probability theory deals with the mathematics of randomness and its applications. It is the basis of mathematical statistics, where the goal is to draw inferences from samples. Non-statistical applications are found in many branches of the social, biological, and physical sciences, as well as in engineering.

Instructions	Course(s)	Student Elections (enter your course selections here)
Select two of the following courses:	Math 423 - Math of Finance Math 523 - Risk Theory Math 525 - Probability Theory Math 526 - Discrete State Stochastic Process Math 547 - Mathematics of Data EECS 502 - Stochastic Processes DATASCI 406 - Comp Meth in Stats & Data Sci STATS 413 - App Regression DATASCI 415 - Data Mining STATS 426 - Intro Theory Stats STATS 430 - Applied Probability DATASCI 451 - Bayesian Data Analysis STATS 500 - Applied Stats STATS 501 - Applied Stats II	1. _____ 2. _____ 3. _____

****Students electing this option must complete Math 525, either here or as their Basic Probability course.**

IV. Advanced Courses** (2 courses)

To complete the major program, each student should elect two additional advanced courses in mathematics or a related area. In all cases, **approval from a departmental advisor is required**. This is a very flexible requirement designed to accommodate special interests and may be satisfied by a broad range of courses in other departments (generally numbered 300 or above) or by mathematics courses numbered 400 or above.

Instructions	Course(s)	Student Elections (enter your course selections here)
Select two Advanced courses:	<i>Selected with approval from a mathematical sciences advisor</i>	1. _____ 2. _____

V. Requirements

At least two of the courses in III. and IV. must be MATH courses

At least one must be a cognate course numbered 300 or above taught outside the department that emphasizes applying significant mathematical tools (at least at the level of Math 215) in another discipline.

Students electing the Probabilistic Methods option must complete Math 525, either in II. or III.