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++) *Students are encouraged to take EECS 280 and EECS 281 as well.	3. _____

Students interested in applications to the natural sciences are strongly encouraged to take Physics 140, 141, 240, 241.

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 412	Math 465 Math 493	2. _____
Select **one** of the following **Analysis** courses:	Math 351 Math 451	Math 354 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: Numerical and Applied Analysis (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.

Computers are being used to solve increasingly complex problems in science and technology. Numerical techniques are algorithms for computer simulation, and analytical techniques may rely on series expansions such as the Taylor or Fourier series expansions. There is a close connection between numerical and analytical techniques. A new analytical technique often leads to more effective numerical algorithms; a good example is the development of wavelets and their applications in signal processing. Students wishing to enter this field must acquire a strong background in mathematics, science, and computing.

	Course(s)		Student Elections

Select **three** of the following courses:	Math 354 - Fourier Analy & Apps
	Math 404 - Intermediate Diff Eqns
	Math 420 - Advanced Linear Alg
	Math 423 - Math of Finance
	Math 451 - Advanced Calc I
	Math 452 - Advanced Calc II
	Math 454 - Bound Val. Prob for PDE
	Math 462 - Mathematical Models
	Math 463 - Math Modeling in Bio.
	Math 464 - Inverse Problems
	Math 471 - Intro to Numerical
	             Methods
	Math 550 - Intro to Adaptive Sys
	Math 555 - Intro to Complex Var.
		AERO 225 - Intro to Gas Dynam
		ME 240 - Dynam & Vibrations
		PHYS 340 - Waves, Heat, Light
		PHYS 401 - Inter Mechanics
		EECS 445 - Machine Learning
		DATASCI 406 - Comp Meth in
		             Stats & Data Sci
		DATASCI 415 - Data Mining
		DATASCI 451 - Bayesian Data
		             Analysis
		STATS 413 - App Regression
		STATS 426 - Intro Theory Stats
		STATS 430 - Applied Probability
			1. _____
			
			2. _____
			
			3. _____

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:	*Selected with approval from a mathematical sciences advisor*	*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.

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