

Stern College for Women

Department/Program Name: Mathematics: General Track

Contact Name: Thomas Otway

Email: otway@yu.edu

Phone: (212) 960-5400 ext 6870

Department/Program Mission Statement

The mission of the undergraduate mathematics program is to produce graduates who can reason creatively and constructively about abstractly defined quantities. This is done by developing students' understanding of analytic, geometric, and algebraic structures, including the ability of students to perform useful calculations using these structures and the ability to write and evaluate rigorous proofs in which these structures appear.

II. Department/Program Student Learning Goals & Objectives:

Department/Program Goal	Objectives
1. Mathematics majors will be able to solve quantitative problems using appropriate methods of infinitesimal analysis	a. Students will be able to identify functions, to understand how these differ from other mathematical expressions, and to perform standard algebraic, differential and geometric operations upon them
	b. Students will be able to apply standard integration methods where appropriate and to understand the concepts of integrability in abstract spaces
	c. Students will be able to analyze the convergence of sequences and series in an appropriate topology, and the effect of domain topology on the analysis of functions
2. Mathematics majors will be able to solve quantitative problems using the algebra and geometry of vectors	a. Students will be able to employ vector fields to solve problems in mechanics, electromagnetism, and the geometry of curves and surfaces

	<p>b. Students will know the definitions and properties of vector spaces, inner product spaces, and metric spaces and will be able to apply these ideas in an appropriate context</p>
	<p>c. Students will be familiar with the algebra of matrices and will be able to perform matrix operations that arise frequently in applied mathematics, including the computation and interpretation of the spectrum of an operator</p>
<p>3. Mathematics majors will be able to solve quantitative problems in other fields</p>	<p>a. Students will be able to solve standard problems in three topics chosen from Computer Science, Physics, and Economics</p>
	<p>b. Students will know the rigorous definitions of the basic quantities in particle mechanics, continuum mechanics and electricity and magnetism and will be able to compute these quantities using multiple integrals</p>
	<p>c.</p>
<p>4. Mathematics majors will be able to write original proofs at an acceptable standard of rigor, and evaluate the correctness of elementary proofs</p>	<p>a. Students will be able to identify the role of individual hypotheses, definitions and axioms in a proof</p>
	<p>b. Students will be able to use techniques such as reduction ad absurdam, contrapositive, nested intervals, contraction mapping, and other standard methods of proof to rigorously demonstrate propositions in analysis, geometry, point-set topology, and algebra</p>
	<p>c. Students will be familiar with the standard mathematical axioms and will be able to apply them to construct and evaluate rigorous proofs</p>
<p>5. Mathematics majors will be able to analyze the geometry of curves and surfaces</p>	<p>a. Students will be able to compute the curvature of curves and surfaces</p>
	<p>b. Students will be able to recognize points of singularity for curves and surfaces and to analyze those singular points</p>