

## Mission Statement

The mission of the Department of Mathematics is to serve the present and future needs of the student body, the faculty, and the public by contributing via teaching to the mathematical education of our students, and via research and scholarship to the body of knowledge in the discipline of mathematics.

The Department provides the mathematics education required of all students at the City College. This ranges from developing the quantitative literacy of the liberal arts graduate, to the more specialized training needed by future practitioners in such areas as teaching, architecture, science and engineering, and medicine.

The Department's introductory, service, elective, and Master's courses prepare the College's students for advanced work in science, engineering, and mathematics. This preparation is crucial in providing New York City with a mathematically trained workforce in the twenty-first century. Our role in this area is a direct contribution to the University's mission of service to the public. The research carried out by members of the Department contributes to the growing body of knowledge in the discipline of mathematics. Its quality and scope are congruent with the University's commitment to excellence in research and scholarship. Moreover, it enhances the excellence of teaching, thereby contributing to the academic quality of the programs offered to our students.

## Learning Outcomes

***Students completing introductory and service courses in the mathematics department will develop the abilities to:***

1. Understand the fundamentals ideas and applications of calculus and linear algebra.
2. Employ technology to investigate mathematical concepts and applications.
3. Succeed in subsequent courses (for which these courses are prerequisites) within the

mathematics department or in other undergraduate departments, (especially in the Grove School of Engineering).

***Students in our elective courses (including mathematics majors) will develop the ability to:***

- Understand the theory of mathematical analysis as well as the theory of other major branches of mathematics such as algebra, discrete mathematics, probability and statistics, and financial mathematics.
- Understand the nature of a mathematical proof and the ideas of counter-examples, specialization and generalization.
- Communicate mathematical concepts both in writing and orally.

***Additional specific objectives for mathematics majors include:***

- (for secondary education majors) The ability to pass the CST and to become effective high school teachers.
- (for applied mathematics majors) Obtaining a knowledge of advanced concepts in either statistics or financial mathematics.
- (for pure math majors) Obtaining an understanding of the role of advanced mathematics in different disciplines and preparation for graduate studies in mathematics and related disciplines, or for careers demanding a high level of analytic skills.

## **Outcome Grid**

1. Perform numeric and symbolic computations.
2. Construct and apply symbolic and graphical representations of functions.
3. Model real-life problems mathematically.
4. Use technology appropriately to analyze mathematical problems.
5. State and apply mathematical definitions and theorems.
6. Prove fundamental theorems.
7. Construct and present a rigorous mathematical argument.

# Learning Outcome Grid

(Outcomes are numbered from 1 to 7 as listed above)

Courses	Learning Outcomes								
	1	2	3	4	5	6	7		
15000 - Math for Contemporary World	X		X	X					
17300 - Elementary Statistics	X	X							
18000- Quantitative Reasoning	X	X	X						
18500 - Basic Ideas 1	X	X	X	X	X				
19000 - College Algebra & Trigonometry	X		X	X	X				
19500 - Pre-calculus	X	X	X		X				
20100- Calculus 1 PM; AM; ME	X	X	X		X				
20200 - Calculus II PM; AM; ME	X	X	X		X				
20300 - Calculus III PM; AM; ME	X	X	X	X	X				
20500 - Elements of Calculus I	X	X	X						
20900 - Elements of Calculus & Statistics	X	X	X	X					
30800 - Bridge to Higher Mathematics PM; ME	X				X	X	X		
32300 - Advanced Calculus I; PM; ME	X	X			X	X	X		
32404 - Advanced Calculus II; PM	B	B			B	B	B		
32800 - Methods of Numerical Analysis; PM	X	X			X	X	X		
34200 - History of Mathematics; PM					B				
34500 - Theory of Numbers; PM	B	B			B	B	B		
34600 - Linear Algebra PM; AM; ME	X	X			X	X	X		
34700 - Modern Algebra PM; ME	X		X		X		X		
36000 - Intro to Modern Geometry ME	X		X	X	X	X	X		
36500 - Elements of Combinatorics AM; ME	B	B	B		B	B	B		
36600 - Introduction to Applied Mathematical Computation AM; ME	B		B	B					
37500 - Probability AM; ME	X		X		X	X			
37600 - Statistics AM	X		X	X	X				
37700 - Applied Statistics and Probability AM	X		X	X	X	X	X		

# Learning Outcome Grid

Courses	Learning Outcomes								
	1	2	3	4	5	6	7		
38200 - Financial Math II AM	X		X	X	X	X			
39100 - Differential Equations AM	X	X	X		X				
39200 - Linear Algebra	X	X	X		X				
39300 - Intro to Applied Fourier Analysis; PM;	X	B	B		B				
39500 - Complex Variables for Scientists and Engineers;	X	B	B		B				
43200 - Theory of Functions of a complex variable	X	B	B		B	B	B		
43400 - Theory of Functions of Real Variables	X				B	B			
43500 - Partial Differential Equations I	X	B	B		B	B	B		
44300 - Set Theory	X	B			B	B	B		
44400 - Mathematical Logic	X	B			B	B	B		
44900 - Intro to Modern Algebra	X				B	B	B		
46100 - Differential Geometry	X	B	B		B	B	B		
46300 - Topology	X		B		B	B	B		
46700 - Mathematical Modeling	X	B	B		B	B	B		
47700 - Stochastic Processes I	X	B	B		B	B	B		
47800 - Advanced Mathematical Statistics	X	B	B		B	B	B		
51100 - Selected topics in Pure Mathematics	X	B	B		B	B	B		
51200 - Selected topics in Classical Analysis	X	B	B		B	B	B		
51300 - Selected topics in probability, statistics and Operations research	X	B	B	B	B	B	B		