

HONORS MATHEMATICS (BS)

CIP: 27.0101

Program Description

Mathematics forms the cornerstone of the sciences, playing a powerful dual role as both a pure science and a tool for solving problems and modeling phenomena in other disciplines. For example, mathematics allows us to build efficient algorithms in computing, investigate rare events in financial markets, model the physical universe, develop predictions for climate science, map and study the human genome, and analyze the structure of the human brain. Mathematics draws vitality from questions arising in the natural world, as well as applications to industry and technology, and yet it is grounded in rigor and abstraction.

Students wishing to major in Honors Mathematics must have achieved a general GPA of 3.65 or higher, and a GPA of 3.65 or higher in the major sequence. The earliest students are able to declare the major is after completion of Honors Analysis I and Honors Linear Algebra II and posting of their spring semester freshman year grades. If the GPA requirements are not met, the students may graduate as Mathematics majors but retain the Honors designation of the individual courses they took on their transcripts.

Admissions

New York University's Office of Undergraduate Admissions supports the application process for all undergraduate programs at NYU. For additional information about undergraduate admissions, including application requirements, see How to Apply (<https://www.nyu.edu/admissions/undergraduate-admissions/how-to-apply.html>).

Program Requirements

Course	Title	Credits	
Core Courses			
Social and Cultural Foundations			
CCSF-SHU 101L Global Perspectives on Society		4	
Interdisciplinary Perspectives on China (Two Courses)			
WRIT-SHU 102 Writing as Inquiry		4	
WRIT-SHU 201 Perspectives on the Humanities		4	
Writing			
Language Courses		8-16	
Mathematics			
Mathematics Requirement Fulfilled by Major Coursework			
Algorithmic Thinking Course		4	
Science			
Experimental Discovery in the Natural World Course		4	
Science, Technology and Society Course		4	
Major Requirements			
Required Mathematics Courses			
MATH-SHU 141 Honors Linear Algebra I		4	
MATH-SHU 142 Honors Linear Algebra II		4	
MATH-SHU 238 Honors Theory of Probability		4	
MATH-SHU 328 Honors Analysis I		4	
MATH-SHU 329 Honors Analysis II			4
MATH-SHU 339 Real Variables			4
MATH-SHU 348 Honors Algebra I			4
MATH-SHU 362 Honors Ordinary Differential Equations			4
Math Electives			
Select five of the following:			
MATH-SHU 160 Networks and Dynamics			
MATH-SHU 226 Functional Analysis			
MATH-SHU 234 Mathematical Statistics			
MATH-SHU 250 Mathematics of Finance			
MATH-SHU 251 Introduction to Math Modeling			
MATH-SHU 252 Numerical Analysis			
MATH-SHU 263 Partial Differential Equations			
MATH-SHU 282 Functions of a Complex Variable			
MATH-SHU 329 Honors Analysis II			
MATH-SHU 345 Introduction to Stochastic Processes			
MATH-SHU 349 Abstract Algebra I			
MATH-SHU 350 Probability Limit Theorems			
MATH-SHU 377 Differential Geometry			
MATH-SHU 997 Independent Study: Mathematics			
Senior Thesis			
Other Elective Credits			28-36
Total Credits			128

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
CCSF-SHU 101L	Global Perspectives on Society	4
MATH-SHU 201	Honors Calculus	4
MATH-SHU 141	Honors Linear Algebra I	4
Chinese or EAP		4
Credits		
2nd Semester/Term		
WRIT-SHU 102	Writing as Inquiry	4
MATH-SHU 328	Honors Analysis I	4
MATH-SHU 142	Honors Linear Algebra II	4
Chinese or EAP		4
Credits		
3rd Semester/Term		
WRIT-SHU 201	Perspectives on the Humanities	4
MATH-SHU 329	Honors Analysis II	4
MATH-SHU 362	Honors Ordinary Differential Equations	4

Chinese or Core Course	Credits	4
4th Semester/Term		16
MATH-SHU 339	Real Variables	4
MATH-SHU 238	Honors Theory of Probability	4
Core Class		4
Chinese or Core Course		4
	Credits	16
5th Semester/Term		16
Core Class		4
Math Elective		4
Math or General Elective		4
Core or General Elective		4
	Credits	16
6th Semester/Term		16
Core Class		4
Math Elective		4
Math or General Elective		4
General Elective		4
	Credits	16
7th Semester/Term		16
MATH-SHU 348	Honors Algebra I	4
Math Elective or General Elective		4
General Elective		4
General Elective		4
	Credits	16
8th Semester/Term		16
Math Elective		4
Math Elective or General Elective		4
General Elective		4
General Elective		4
	Credits	16
	Total Credits	128

Learning Outcomes

Upon successful completion of this program, students will:

1. Understand the fundamental theorems of analysis, master the ideas of their proofs and learn how to apply them.
2. Understand the fundamental theorems of algebra, geometry and probability, master the ideas of their proofs and learn how to apply them.
3. Develop computational skills in mathematics and apply them to concrete problems.

Policies

1. Students who did not attend a Chinese-medium high school fulfill the Core language requirement by demonstrating proficiency of the Chinese language through the Intermediate level. Chinese speakers who did not attend an English-medium high school fulfill the Core language requirement through completion of EAP-SHU 100 English for Academic Purposes I and EAP-SHU 101 English for Academic Purposes II. Additional information can be found on the NYU Shanghai Core Curriculum page (<https://bulletins.nyu.edu/undergraduate/shanghai/core-curriculum/#text>).
2. Students are strongly encouraged to complete the Required Mathematics Courses before starting their Mathematics Electives.

3. In their senior year, each Honors Mathematics student is additionally required to complete a capstone project, ending with a written report and an oral presentation.

Prerequisite Courses for Declaring a Major

Final grade of C/ current semester midterm grade of B or higher in Analysis I + Honors Linear Algebra II [Both must be completed, not in progress] + Cumulative GPA 3.65 or higher in all classes and in Math classes.

Major Policies

Honors Math and Data Science Double Major Guidelines

Students who are interested in pursuing a Data Science major along with an Honors Mathematics major can have more than two courses that may be double-counted between the majors. Students would need to complete course requirements for both majors. The following courses are allowed to be double counted toward both majors:

Honors Math and Data Science (Concentration in Mathematics)

- MATH-SHU 141 Honors Linear Algebra I
- MATH-SHU 142 Honors Linear Algebra II
- MATH-SHU 238 Honors Theory of Probability
- MATH-SHU 329 Honors Analysis II

NYU Policies

University-wide policies can be found on the New York University Policy pages (<https://bulletins.nyu.edu/nyu/policies/>).

NYU Shanghai Policies

Additional academic policies can be found on the NYU Shanghai Academic Policies page (<https://bulletins.nyu.edu/undergraduate/shanghai/academic-policies/>).