

ECONOMICS AND MATHEMATICS (BA)

Department Website (<http://math.nyu.edu>)

NYSED: 19735 HEGIS: 1799.00 CIP: 27.9999

Program Description

The Department of Economics prepares students to understand individual and group decision-making, the structure of markets and economies, and the relationship between regions within the global economy. Although the department is large, its students enjoy an excellent student-faculty rapport. Many of the faculty members are associated with distinguished research institutions. By being able to study with faculty who are actively engaged in research, students learn not only about the fundamentals of economic theory but also how such theory is utilized. They have the opportunity to conduct research on their own. Honors students are required to write an honors thesis under direct faculty supervision.

Students majoring in economics have many options open to them after graduation. The major prepares them for graduate school in economics, business management, or public administration. Preprofessional students will find that an economics major not only fosters the discipline medical or law school demands, but provides a solid foundation for these and other careers. Employers and professional schools appreciate the skills acquired by economics students and hire economics majors because they can think quantitatively, qualitatively, and analytically. Studying economics at New York University is especially rewarding because of its urban environment. Students often find career opportunities on Wall Street, at the United Nations, or in various corporate, financial, governmental, agency, and nonprofit institutional settings.

Honors Program in Economics and Mathematics

Honors students are required to take twenty courses (80 credits). A 3.65 overall GPA and a 3.65 average in economics and mathematics courses are required. Honors students must participate in a year-long research program in their senior year and write a thesis under faculty supervision. Note that students may satisfy their research requirement with either the economics honors sequence (ECON-UA 410 and 450), mathematics Independent Study (MATH-UA 997 and 998), or the SURE or AM-SURE program in the Department of Mathematics.

Interested students must consult with the directors of undergraduate studies in both departments for advisement and for permission to enter the honors program. Ideally, students should speak to the Departments of Economics and Mathematics early in their sophomore year to begin planning for honors. Note that students may satisfy their research requirement with either the economics honors sequence (ECON-UA 410 Honors Tutorial and ECON-UA 450 Honors Thesis I), mathematics Independent Study (MATH-UA 997 Independent Study and MATH-UA 998), or the SURE or AM-SURE program in the Department of Mathematics.

Course	Title	Credits
Economics Requirements		
ECON-UA 1	Introduction to Macroeconomics	4
ECON-UA 2	Introduction to Microeconomics	4

ECON-UA 11	Microeconomic Analysis	4
ECON-UA 13	Macroeconomic Analysis	4
ECON-UA 20	Analytical Statistics ¹	4
ECON-UA 266	Intro to Econometrics	4
Select three economics electives ²		12
ECON-UA 410	Honors Tutorial	4
ECON-UA 450	Honors Thesis I ³	4

Mathematics Requirements

MATH-UA 131 or MATH-UA 121	Mathematics for Economics I Calculus I	4
MATH-UA 132 or MATH-UA 122	Mathematics for Economics II Calculus II	4
MATH-UA 133 or MATH-UA 123 or MATH-UA 129	Mathematics for Economics III Calculus III Honors Calculus III	4
MATH-UA 140 or MATH-UA 148	Linear Algebra Honors Linear Algebra	4
MATH-UA 328	Honors Analysis I	4
Select two electives from the following:		8
MATH-UA 238 or MATH-UA 233	Honors Theory of Probability (if not taken in the honors elective category below) Theory of Probability	
MATH-UA 234	Mathematical Statistics ⁴	
MATH-UA 235	Probability & Statistics ⁴	
MATH-UA 240	Combinatorics	
MATH-UA 248	Theory of Numbers	
MATH-UA 250	Mathematics of Finance	
MATH-UA 251	Intro to Math Modeling	
MATH-UA 252	Numerical Analysis	
MATH-UA 253	Linear and Nonlinear Optimization	
MATH-UA 268 or MATH-UA 262	Honors Ordinary Differential Equations (if not taken in the honors elective category below) Ordinary Diff Equations	
MATH-UA 263	Partial Diff Equations	
MATH-UA 264	Chaos & Dynamical Systems	
MATH-UA 282	Functions of a Complex Variable	
MATH-UA 329	Honors Analysis II	
MATH-UA 343 or MATH-UA 348	Algebra Honors Algebra I	
MATH-UA 349	Honors Algebra II	
MATH-UA 375	Topology	
MATH-UA 377	Differential Geometry	
MATH-UA 393		
MATH-UA 394		
MATH-UA 397		

or MATH-UA 398	
Honors Electives	
Select two honors electives from the following:	8
MATH-UA 238 Honors Theory of Probability	
MATH-UA 268 Honors Ordinary Differential Equations	
MATH-UA 329 Honors Analysis II	
MATH-UA 348 Honors Algebra I	
or MATH-UA 349 Honors Algebra II	
MATH-UA 393	
or MATH-UA 394	
or MATH-UA 397	
or MATH-UA 398	
Total Credits	80

1

If not taking MATH-UA 234 Mathematical Statistics

2

At least two must be theory electives numbered ECON-UA 300-399. Note that students who take MATH-UA 234 Mathematical Statistics instead of ECON-UA 20 Analytical Statistics for the statistics requirement must take a total of four ECON-UA electives.

3

Alternates: Independent Study (MATH-UA 997 and 998), or the SURE or AM-SURE programs in the Department of Mathematics.

4

Note that if MATH-UA 235 is taken, then MATH-UA 233 or MATH-UA 238 and/or MATH-UA 234 may not be counted toward the major requirements; also note that if MATH-UA 233 or MATH-UA 238 and/or 234 is taken, then MATH-UA 235 may not be counted toward the major requirements.

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

In the economics department, joint majors with mathematics must follow the theory concentration. Nine courses must be taken from each department. A grade of C or better is necessary in all courses used to fulfill joint major requirements; courses graded Pass/Fail do not count. Interested students should consult with the directors of undergraduate studies in both departments for additional information.

Course	Title	Credits
General Education Requirements		
First-Year Seminar		4
EXPOS-UA 1	Writing The Essay:	4
Foreign Language ¹		16

Physical Science		4
Life Science		4
Texts and Ideas		4
Cultures and Contexts		4
Expressive Culture		4
Major Requirements		
<i>Mathematics Courses</i> ²		
MATH-UA 131	Mathematics for Economics I	4
or MATH-UA 121	Calculus I	
MATH-UA 132	Mathematics for Economics II	4
or MATH-UA 122	Calculus II	
Select one of the following:		4
MATH-UA 133	Mathematics for Economics III	
MATH-UA 123	Calculus III	
MATH-UA 129	Honors Calculus III	
MATH-UA 140	Linear Algebra	4
or MATH-UA 148	Honors Linear Algebra	
MATH-UA 325	Analysis	4
or MATH-UA 328	Honors Analysis I	
Select four of the following:		16
MATH-UA 233	Theory of Probability ³	
or MATH-UA 238	Honors Theory of Probability	
MATH-UA 234	Mathematical Statistics ³	
MATH-UA 235	Probability & Statistics ³	
MATH-UA 240	Combinatorics	
MATH-UA 248	Theory of Numbers	
MATH-UA 250	Mathematics of Finance	
MATH-UA 251	Intro to Math Modeling	
MATH-UA 252	Numerical Analysis	
MATH-UA 253	Linear and Nonlinear Optimization	
MATH-UA 262	Ordinary Diff Equations	
or MATH-UA 268	Honors Ordinary Differential Equations	
MATH-UA 263	Partial Diff Equations	
MATH-UA 264	Chaos & Dynamical Systems	
MATH-UA 282	Functions of a Complex Variable	
MATH-UA 329	Honors Analysis II	
MATH-UA 343	Algebra	
or MATH-UA 348	Honors Algebra I	
MATH-UA 349	Honors Algebra II	
MATH-UA 375	Topology	
MATH-UA 377	Differential Geometry	
MATH-UA 393		
MATH-UA 394		
MATH-UA 397		
MATH-UA 398		

Economics Requirements

ECON-UA 1	Introduction to Macroeconomics	4
ECON-UA 2	Introduction to Microeconomics	4
ECON-UA 11	Microeconomic Analysis	4
ECON-UA 13	Macroeconomic Analysis	4
Select one of the following:		4
ECON-UA 20	Analytical Statistics	
MATH-UA 234	Mathematical Statistics ⁴	
ECON-UA 266	Intro to Econometrics	4
Electives		
Select three economics electives ⁵		12
Other Elective Credits		12
Total Credits		128

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The foreign language requirement is satisfied upon successful completion through the Intermediate level of a language. This may be accomplished in fewer than 16 credits, but those credits must then be completed as elective credit.

2

Note that students must choose one calculus track or the other and cannot mix courses from the two tracks; note further that the Mathematics for Economics sequence is the preferred sequence for this joint major.

3

Note that if MATH-UA 235 is taken, then MATH-UA 233 or MATH-UA 238 and/or MATH-UA 234 may not be counted toward the major requirements; also note that if MATH-UA 233 or MATH-UA 238 and/or 234 is taken, then MATH-UA 235 may not be counted toward the major requirements.

4

Students taking the MATH-UA 234 Mathematical Statistics option must complete one additional ECON-UA elective (four total).

5

At least two must be theory electives numbered ECON-UA 300 to 399.

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
MATH-UA 131	Mathematics for Economics I	4
ECON-UA 2	Introduction to Microeconomics	4
Texts and Ideas		4
First-Year Seminar		4
Credits		16
2nd Semester/Term		
MATH-UA 132	Mathematics for Economics II	4
ECON-UA 1	Introduction to Macroeconomics	4
Cultures and Contexts		4
EXPOS-UA 1	Writing The Essay:	4
Credits		16
3rd Semester/Term		
MATH-UA 133	Mathematics for Economics III	4
MATH-UA 140 or MATH-UA 148	Linear Algebra or Honors Linear Algebra	4
ECON-UA 11	Microeconomic Analysis	4
Foreign Language I		4
Credits		16

4th Semester/Term		
MATH-UA 325 or MATH-UA 328	Analysis or Honors Analysis I	4
ECON-UA 13	Macroeconomic Analysis	4
ECON-UA 20	Analytical Statistics	4
Foreign Language II		4
Credits		16
5th Semester/Term		
Major Elective in Mathematics (#1 of 4) ¹		4
ECON-UA 266	Intro to Econometrics	4
Foreign Language III		4
Expressive Culture		4
Credits		16
6th Semester/Term		
Major Elective in Mathematics (#2 of 4)		4
Major Elective (200-Level) in Economics ²		4
Foreign Language IV		4
Other Elective Credits		4
Credits		16
7th Semester/Term		
Major Elective in Mathematics (#3 of 4)		4
Major Elective (300-Level) in Economics (#1 of 2)		4
Physical Science		4
Other Elective Credits		4
Credits		16
8th Semester/Term		
Major Elective in Mathematics (#4 of 4)		4
Major Elective (300-Level) in Economics (#2 of 2)		4
Life Science		4
Other Elective Credits		4
Credits		16
Total Credits		128

1

All must be drawn from a list of specific MATH-UA electives in the program of study.

2

All ECON-UA electives must be drawn from Theory Concentration offerings.

Learning Outcomes

Upon completion of program requirements, students are expected to have acquired:

1. A substantial knowledge of microeconomics, macroeconomics, and econometrics in both theory and application.
2. The ability to analyze stylized problems using an economic framework and to extend these skills to the analysis of real-world applications.
3. The skills to use statistical models that enable them to conduct quantitative analyses of a wide variety of economic problems.
4. The ability to read, analyze, and clearly explain the economic theory underlying modern economic research.
5. The skills to construct their own behavioral models for use in economics research.
6. Proficiency in the foundations of modern mathematics, including discrete mathematics, calculus, analysis, and algebra.
7. The ability to communicate mathematically, including understanding, developing, and critiquing mathematical arguments and rigorous proofs.

8. The skills to apply mathematical ideas and methods to questions and problems both within and outside of the mathematical sciences.
9. Advanced knowledge in some specific areas of mathematics, such as differential equations, geometry and topology, complex analysis, probability and statistics, number theory, or numerical analysis.
10. Experience in using appropriate technology to calculate, visualize, and model problems.

Policies

NYU Policies

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

College of Arts and Science Policies

A full list of relevant academic policies can be found on the CAS Academic Policies page (<https://bulletins.nyu.edu/undergraduate/arts-science/academic-policies/>).