

MATHEMATICAL ECONOMICS, BA

Economics is a social science and, as such, an important component of the liberal arts curriculum. At the core of economics are theories of how individuals, firms, and other organizations make choices and interact, taking into account constraints on their behaviors. Among the topics studied in economics are the following:

- The determination of prices and quantities in various types of markets, from perfectly competitive commodity markets to highly regulated utility markets and internet auctions.
- The effects of taxes, subsidies, and regulations.
- The determination of aggregate economic activity (e.g., GDP, unemployment).
- Inflation, monetary policy, and financial intermediation.
- Economic growth and income distribution.
- International trade and international finance (e.g., exchange rates).

The Mathematical Economics Major is intended for students with a strong intellectual interest in both mathematics and economics and, in particular, for students who may pursue a graduate degree in economics. Advanced economics makes extensive use of formal mathematical models. The major introduces undergraduate students to rigorous theoretical-quantitative and empirical-quantitative approaches to the analysis of economic problems. In comparison to the Economics Major, the Mathematical Economics Major emphasizes a more formal mathematical analysis, preparing students for academic-style research in economics.

The minimum total course units (<https://www.college.upenn.edu/credits-needed-major>) for graduation in this major is 36. Double majors may entail more course units.

For more information: <http://economics.sas.upenn.edu/undergraduate-program/mathematical-economics-major>

For information about the General Education requirements, please visit the College of Arts & Sciences Curriculum (<https://www.college.upenn.edu/curriculum>) page.

Code	Title	Course Units
College General Education Requirements and Free Electives		
Foundational Approaches + Sectors ¹ + Free Electives		20
Major Requirements		
<i>MATH Core Requirements</i> ²		
Select 1 course unit of Calculus II		1
Select 1 course unit of Calculus III		1
Select 1 course unit of Algebra		1
MATH 360 & MATH 361	Advanced Calculus and Advanced Calculus	2
or MATH 508 & MATH 509	Advanced Analysis and Advanced Analysis	
<i>STAT Core Requirements</i>		
Select 1 or 2 course units of the following: ³		1-2
STAT 430 & STAT 431	Probability and Statistical Inference	

ESE 301 & ESE 302	Engineering Probability and Engineering Applications of Statistics	
ECON 103	Statistics for Economists ⁴	
<i>MATH Electives</i>		
Select 2 course units of MATH Electives		2
<i>ECON Core Requirement</i> ⁵		
Introduction to Micro and Macro Economics: ⁶		
ECON 001	Introduction to Micro Economics	1
ECON 002	Introductory Economics: Macro	1
Waiver Conversion Complete		
Intro Micro/Macro - For WHARTON Students Only:		
ECON 010	Introduction to Economics for Business	
Select an additional ECON course ⁷		
<i>Intermediate Level Micro and Macro Economics</i>		
ECON 101	Intermediate Microeconomics	1
ECON 102	Intermediate Macroeconomics	1
ECON 681	Microeconomic Theory	1
<i>ECON Electives</i>		
Select 3 course units of ECON Electives		3
Total Course Units		36-37

- ¹ You may count no more than one course toward both a Major and a Sector requirement. For Exceptions, check the Policy Statement (<http://www.college.upenn.edu/sectors-policy>).
- ² Students intending to major in Mathematical Economics are encouraged to take MATH 116 Honors Calculus and to consider MATH 260 Honors Calculus, Part II.
- ³ NOTE: These MATH and ECON courses count toward the MATH and ECON electives.
- ⁴ If ECON 103 Statistics for Economists is taken, one additional ECON or MATH course from the following: MATH 546 Advanced Probability, MATH 547 Stochastic Processes, ECON 104 Econometrics, ECON 221 Econometric Forecasting, or ECON 222 Advanced Econometric Techniques and Applications.
- ⁵ LPS academic year courses require approval of Undergraduate Chair EXCEPT for ECON 001 Introduction to Micro Economics & ECON 002 Introductory Economics: Macro.
- ⁶ ECON 001 Introduction to Micro Economics and ECON 002 Introductory Economics: Macro are prerequisites for all economics courses. ECON 001 Introduction to Micro Economics is the prerequisite for ECON 002 Introductory Economics: Macro.
- ⁷ ECON Course Required if ECON 010 Introduction to Economics for Business is taken.

Honors

Applicants must have a minimum GPA of 3.5 and an A- or better in 3 graduate level courses:

Code	Title	Course Units
ESE 605	Modern Convex Optimization	
One 600 level Econ course		
One 500 level Math course		

The degree and major requirements displayed are intended as a guide for students entering in the Fall of 2018 and later. Students should consult with their academic program regarding final certifications and requirements for graduation.
