



Mathematical Economics

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Mathematical Economics Major

Graduates with strong analytical skills are highly valued in today's increasingly data-driven and interconnected business world. The Mathematical Economics major provides a course of study that allows students to not only acquire some of these highly valued analytical skills, but also integrates that knowledge with a deeper understanding of the business world. This combination of mathematics and economics knowledge makes Mathematical Economics majors highly competitive in the job market and excellent candidates for graduate school.

The Mathematical Economics major satisfies the requirements for the B.S. degree in the School of Arts & Sciences. It requires students to take 12 core units followed by 4 elective courses. The core courses serve to build a strong basic foundation in both economics and mathematics. The elective courses allow students to tailor their major to their post-graduation goals. To provide further breadth to their education Mathematical Economics majors may also declare additional majors (including in the business school) as long as these additional majors are not Economics or Mathematics.

Recent graduates have chosen elective sequences towards post-graduation paths that include jobs in finance, data science, economics, actuarial sciences, consulting, and management, and graduate school in economics, statistics, strategy, and business. Advisors and coordinators in the major work closely with students to choose electives consistent with the students' short and long-term goals.

The program coordinators additionally work with other departments to help Mathematical Economics majors take non-major courses that complement their studies towards post-graduation goals in fields such as finance, consulting, and actuarial sciences.

Post-Graduate Paths

Recent Mathematical Economics majors have pursued a wide-range of careers spanning the spectrum from actuarial sciences to medical school to graduate school. Some students also opt for the 3-2 dual degree program with Columbia. Below is information about some of the more common career paths taken by Mathematical Economics majors:

Graduate School

Graduates of the Mathematical Economics program are well positioned to enter graduate studies in the quantitative sciences, including data science, economics, finance, and statistics.

Graduate study in economics prepares students to be experts in economic research and data analysis. Post graduate school economists pursue a variety of careers that include working as professors or researchers, working in government/nonprofit work, or working in the private sector as a consultant or professional economist. Academic research in economics covers a broad spectrum of topics that includes public finance, economic growth, business cycles, health, education, demographics, labor markets, inequality, trade, individual human behavior and industrial organization.

Graduate study in statistics or data science prepares students to develop techniques to effectively collect, model and analyze data. Post graduate school statisticians apply their knowledge of statistical methods to a variety of problems across fields as diverse as economics, medicine, sports, engineering, marketing, finance, etc. Given their versatility, the career path for a statistician or data scientist is highly varied, including being a professor, software engineer, business or risk analyst. Academic research is similarly varied from building theoretical statistical techniques and models, to applying them to a variety of real-world problems across many fields.

Finance Sector

Many jobs in the financial sector require individuals to study companies and macroeconomic conditions with an aim of making economic, industry, or firm-level

recommendations. For example, many financial analysts study companies and make recommendations with regards to investment strategies. Other jobs in the financial sector specialize in the buying and selling of assets, identifying areas where a firm could improve efficiency, preparing financial reports, and generally look after the financial health of a firm or industry.

Mathematical Economics majors have the option of complementing their studies with courses in the Finance department. This combination of mathematics, statistics, economics, and finance courses provides strong applied quantitative skills that are highly valued in this sector making such majors very attractive candidates for finance sector jobs.

Data Scientist

Data Scientists are experts at solving complex problems in business and economics by collecting, managing and analyzing large data bases. This is an interdisciplinary field of study that is rooted in statistics and computer coding, and data science is acknowledged to one of the most important new careers for the 21st century. Mathematical Economics majors are well suited for data science jobs as the major requires students to take introductory statistics and econometrics courses, which can then be supplemented with electives in the areas of statistics, econometrics, and data science. Additionally, many electives in the Economics department require students to work with and analyze data.

Actuary Sciences

Actuaries are experts in calculating and managing risk. Actuaries work in a variety of industries, including insurance, consulting, and government. They apply mathematical and statistical methods to calculate and assess risk in these industries. For example, in the insurance industry actuaries calculate risks and determine the premiums for policy holders, while as consultants they help firms evaluate risk with respect to strategic management decisions. The Mathematical Economics major provides a pathway into this career by both providing courses that fulfill the

VEE requirements and also courses that help students prepare for the Actuarial Science Probability and Financial Mathematics exams.

Economic Consulting

Consultants are generally hired to study a project/company and give advice on how to help improve performance and succeed strategically. Consultants are problem solvers. They can be found in nearly every industry in the economy, providing advice on management, finance, accounting, marketing, data, education, health, government, environment, politics, etc. Mathematical economics students with their strong data, analytical, and problem solving skills are highly valued in this industry. Additionally Mathematical Economics majors have the option to complement their studies with consulting courses in the Management department.

Dual Degree Program

The University of Richmond offers students the option to pursue dual degrees in a five or six-year period. This opportunity allows a student to earn a Bachelor of Science from Richmond and an additional Bachelor of Science from a cooperative program at Columbia University. Mathematical Economics majors may opt for this option. For more details, please see the Engineering Dual Degree fact sheet.

Major Requirements

The 16-unit Mathematical Economics major satisfies requirements for a Bachelor of Science.

- CMSC 150 – Introduction to Computing
- ECON 101 – Principles of Microeconomics
- ECON 102 – Principles of Macroeconomics
- ECON 270 – Introductory Econometrics
- ECON 271 – Microeconomic Theory
- ECON 272 – Macroeconomic Theory
- ECON 341 – Mathematical Economics
- MATH 211 – Calculus
- MATH 212 – Calculus II
- MATH 235 – Multivariate Calculus
- MATH 245 – Linear Algebra
- MATH 329 – Probability

In addition, students must take:

- Two units of mathematics electives at the 300 level.
- Two units of economics electives, at least one of which must be at the 200 level

Students are expected to fulfill all prerequisites necessary for courses within the major. Prerequisites do not count toward the major unless otherwise noted. Additionally, Mathematical Economics majors may not select Mathematics or Economics as an additional major or minor.

Honors Program

Highly-qualified and motivated students may seek departmental honors in Mathematical Economics. Visit math.richmond.edu/academics/honors.html for more information.



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