

# MATHEMATICS: MATHEMATICS FOR ECONOMICS AND FINANCE

## REQUIREMENTS

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The Mathematics Major with Economics and Finance focus requires 10 distinct courses for at least 30 credits as described below. Note that while some courses may be used to fulfill more than one requirement it is still considered only a single course and may only contribute once to the total course count. Finally, at most one course from each of the following groupings may be used to fulfill the minimum course and credit requirement (i.e.: minimum of ten courses and at least 30 credits): Intro Linear Algebra (MATH 320, MATH 340, MATH 341, MATH 375), Intro Differential Equations (MATH 319, MATH 320 or MATH 376), and Intro Probability (MATH/STAT 309 or MATH/STAT 431).

Code	Title	Credits
<b>Core Math Requirement (minimum of six distinct MATH courses for at least 18 credits)<sup>1</sup></b>		
<i>Linear Algebra</i>		3-5
MATH 341	Linear Algebra	
or MATH 320	Linear Algebra and Differential Equations	
or MATH 340	Elementary Matrix and Linear Algebra	
or MATH 375	Topics in Multi-Variable Calculus and Linear Algebra	
<i>Differential equations</i>		0-5
MATH 319	Techniques in Ordinary Differential Equations	
or MATH 320	Linear Algebra and Differential Equations	
or MATH 322	Applied Mathematical Analysis	
or MATH 376	Topics in Multi-Variable Calculus and Differential Equations	
or MATH 415	Applied Dynamical Systems, Chaos and Modeling	
or MATH 519	Ordinary Differential Equations	
<i>Intermediate Mathematics Requirement (complete at least one)</i>		0-6
MATH 321 & MATH 322	Applied Mathematical Analysis and Applied Mathematical Analysis	
MATH 341	Linear Algebra	
MATH 375	Topics in Multi-Variable Calculus and Linear Algebra	
MATH 421	The Theory of Single Variable Calculus	
<i>Analysis Requirement</i>		3
MATH 521	Analysis I	
<i>Electives to reach required six courses for at least 18 credits of MATH</i>		6-9
<i>At least one course must be selected from:</i>		

MATH/ COMP SCI 513	Numerical Linear Algebra
MATH/ COMP SCI 514	Numerical Analysis
MATH 519	Ordinary Differential Equations
MATH 522	Analysis II
MATH/ COMP SCI/ISY E/ STAT 525	Linear Optimization
MATH 531	Probability Theory
MATH 535	Mathematical Methods in Data Science
MATH 540	Linear Algebra II
MATH 605	Stochastic Methods for Biology
MATH 616	Data-Driven Dynamical Systems, Stochastic Modeling and Prediction
MATH 619	Analysis of Partial Differential Equations
MATH 627	Introduction to Fourier Analysis
MATH 629	Introduction to Measure and Integration
MATH/ISY E/ OTM/STAT 632	Introduction to Stochastic Processes
MATH 635	An Introduction to Brownian Motion and Stochastic Calculus
<i>Remaining courses/credits may be from:</i>	
MATH/STAT 310	Introduction to Probability and Mathematical Statistics II
MATH 321	Applied Mathematical Analysis
MATH 322	Applied Mathematical Analysis
MATH 415	Applied Dynamical Systems, Chaos and Modeling
MATH 421	The Theory of Single Variable Calculus
MATH/ COMP SCI/ ISY E 425	Introduction to Combinatorial Optimization
MATH/STAT 431	Introduction to the Theory of Probability
or MATH/ STAT 309	Introduction to Probability and Mathematical Statistics I
MATH 443	Applied Linear Algebra
MATH 444	Graphs and Networks in Data Science
MATH/ COMP SCI/ STAT 475	Introduction to Combinatorics
<b>Economics/Finance Requirement (Four Courses distinct from the above for at least 12 credits)<sup>1</sup></b>	
<i>Select one of the following introductory sequences:</i>	
ECON 311 & ECON 312	Intermediate Microeconomic Theory - Advanced Treatment and Intermediate Macroeconomic Theory - Advanced Treatment

6-8

ECON 301 & ECON 302	Intermediate Microeconomic Theory and Intermediate Macroeconomic Theory
ECON/ FINANCE 300 & ECON/ FINANCE 320	Introduction to Finance and Investment Theory
Economics/Finance Elective (choose at least two) <sup>2</sup>	
ECON 400	Introduction to Applied Econometrics
ECON 410	Introductory Econometrics
ECON/A A E 421	Economic Decision Analysis
ECON 435	The Financial System
ECON 441	Analytical Public Finance
ECON 442	Macroeconomic Policy
ECON 448	Human Resources and Economic Growth
ECON 450	Wages and the Labor Market
ECON 451	The Economic Approach to Human Behavior
ECON 455	Behavioral Economics
ECON 458	Industrial Structure and Competitive Strategy
ECON 460	Economic Forecasting
ECON 461	International Macroeconomics
ECON 464	International Trade
ECON 468	Industrial Organization and Imperfect Competition
ECON 475	Economics of Growth
ECON/ FINANCE 503	Markets with Frictions
ECON 521	Game Theory and Economic Analysis
ECON/A A E 526	Quantitative Methods in Agricultural and Applied Economics
ECON 621	Markets and Models
ECON 661	Issues in International Macroeconomics
ECON 664	Issues in International Trade
ECON 666	Issues in International Finance
FINANCE 305	Financial Markets, Institutions and Economic Activity
FINANCE 325	Corporation Finance
FINANCE 330	Derivative Securities
FINANCE 340	Fixed Income Securities
FINANCE/ INTL BUS 445	Multinational Business Finance

**Total Credits****30**

## RESIDENCE AND QUALITY OF WORK

- 2.000 GPA on all MATH courses and courses eligible for the major.<sup>3</sup>
- 2.000 GPA on at least 15 credits of upper level credit in the major.<sup>4</sup>
- 15 credits in MATH in the major taken on the UW-Madison campus.<sup>5</sup>

## FOOTNOTES

- <sup>1</sup> Some courses which follow may have prerequisites outside of the courses approved for this named option.
- <sup>2</sup> Any MATH course from the elective list above may be used in lieu of any of the following courses.
- <sup>3</sup> This includes any MATH courses (and those cross-listed with MATH) regardless of appearing in the tables above as well as only those non-MATH courses which are explicitly listed in the tables above.
- <sup>4</sup> This includes any MATH courses (and those cross-listed with MATH) numbered 307 and above, regardless of appearing in the tables above, as well as only those non-MATH course explicitly listed in the tables above which carry the advanced LAS designation.
- <sup>5</sup> This includes any MATH courses (and courses cross-listed with MATH) numbered 307 and above regardless of appearing in the tables above.