MATHEMATICS: MATHEMATICS FOR ECONOMICS AND FINANCE

The mathematics named option programs allow students to develop a deep understanding of how the subject relates to other areas of human inquiry. The requirements for these programs feature mathematics courses with topics inspired by and commonly applied to problems in these associated fields. Though often paired with a second major in a related area, these programs function well alone and are suited to any mathematics student with a variety of interests. Students interested in a named option program are recommended to meet with an advisor to navigate the various plans and courses available to them. Advising information can be found on the BA or BS pages (http://guide.wisc.edu/undergraduate/letters-science/mathematics/mathematics-ba/#advisingandcareerstext).

The named options do not support honors in the major.

REQUIREMENTS

REQUIREMENTS

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
Core Math Requirement (minimum of six distinct MATH courses for at least 18 credits) [1]		
Linear Algebra		*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	
Differential equations		*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	
Intermediate Mathematics Requirement (complete at least one)		*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	
Analysis Requirement		*3*
MATH 521	Analysis I	
Electives to reach required six courses for at least 18 credits of MATH		*6-9*
At least one course must be selected from:		
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/I SY 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/I SY E/ OTM/STAT 632	Introduction to Stochastic Processes	
MATH 635	An Introduction to Brownian Motion and Stochastic Calculus	
Remaining courses/credits may be from:		
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/ I SY 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	
Economics/Finance Requirement (Four Courses distinct from the above for at least 12 credits) [1]		
Select one of the following introductory sequences:		*6-8*
ECON 311 & ECON 312	Intermediate Microeconomic Theory - Advanced Treatment and Intermediate Macroeconomic Theory - Advanced Treatment	
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) [2]		6-8
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.[3]
- 2.000 GPA on at least 15 credits of upper level credit in the major.[4]
- 15 credits in MATH in the major taken on the UW-Madison campus.[5]

FOOTNOTES

[1] Some courses which follow may have prerequisites outside of the courses approved for this named option.

[2] Any MATH course from the elective list above may be used in lieu of any of the following courses.

[3] 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.

[4] 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.

[5] This includes any MATH courses (and courses cross-listed with MATH) numbered 307 and above regardless of appearing in the tables above.

FOUR-YEAR PLAN

SAMPLE FOUR-YEAR PLAN

This Sample Four-Year Plan is a tool to assist students and their advisor(s). Students should use it—along with their DARS report, the Degree Planner, and Course Search & Enroll tools—to make their own four-year plan based on their placement scores, credit for transferred courses and approved examinations, and individual interests. As students become involved in athletics, honors, research, student organizations, study abroad, volunteer experiences, and/or work, they might adjust the order of their courses to accommodate these experiences. Students will likely revise their own four-year plan several times during college.

In general, your four year plan in mathematics should be organized along the following sequence:

1. Calculus
2. Linear Algebra
3. Required Intermediate level course
4. Additional intermediate level courses as needed
5. Required advanced level course
6. Additional advanced level courses

Freshman

Fall	**Credits**	**Spring**	**Credits**
MATH 221	5	MATH 222	4
Literature Breadth	3	Literature Breadth	3
Communication A	3	Ethnic Studies	3

Foreign Language [if required]	4	Foreign Language (if required)	4
	15		**14**

Sophomore

Fall	**Credits**	**Spring**	**Credits**
MATH 234[1]	4	MATH Linear Algebra	3
Humanities Breadth	3	MATH Differential Equations	3
Communication B	3-5	Humanities Breadth	3
Physical Science Breadth	3	Physical Science Breadth	3
Elective	3	Elective	3
	16		**15**

Junior

Fall	**Credits**	**Spring**	**Credits**
MATH Required Intermediate Course	3	MATH Elective	3
Economics/ Finance intro course 1	3-4	Economics/Finance intro course 2	3-4
Biological Sciences Breadth	3	Biological Sciences Breadth	3
Social Science Breadth	3	Physical Science Breadth	3
Elective	3	Elective	3
	15		**15**

Senior

Fall	**Credits**	**Spring**	**Credits**
MATH 521	3	Advanced MATH Elective	3
Econ/Finance Elective	3-4	Econ/Finance elective	3-4
Social Science Breadth	3	Social Science Breadth	3
Elective	3	Elective	3
Elective	3	Elective	3
	15		**15**

Total Credits 120

Students must declare a major by the time they reach Senior standing (86 credits).

Please refer to the Requirements tab in Guide for additional College of Letters & Science Breadth and Degree Requirements as well as Residence and Quality of Work requirements for the major.

[1] Students should declare the math major upon successful completion of this course