

ECONOMICS & MATHEMATICS

1019 Milstein Learning Center

212-854-3454

Department Administrator: Robert O'Connor

Mission

The Economics and Mathematics major provides the student with a grounding in economic theory comparable to that provided by the general economics major and exposes the student to rigorous and extensive training in mathematics. The program will be particularly useful for students planning to do graduate work in economics, which frequently demands greater mathematical training than that acquired through the minimum requirements of the basic economics degree.

Economics Department Representative: Sharon Harrison

Mathematics Department Representative: David Bayer

Requirements for the Major

The Economics & Mathematics track requires a minimum of 15 courses (48 minimum credits).

Economics (8 courses)

ECON BC1003	Introduction to Economic Reasoning	3
ECON BC3018	ECONOMETRICS	4
ECON BC3033	Intermediate Macroeconomic Theory	4
ECON BC3035	Intermediate Microeconomic Theory	4
ECON BC3041	Theoretical Foundations of Political Economy	3

Select one of the following: 4

ECON BC3062	Senior Thesis II (two semesters of the Senior Thesis are optional)	
ECON BC3063	SENIOR SEMINAR *	

Two economics electives with an intermediate micro- or macroeconomic theory course as prerequisite

Mathematics (7 courses)

MATH UN1102 - MATH UN1201	CALCULUS II and Calculus III	6
MATH UN2010	LINEAR ALGEBRA	3
MATH UN2500	ANALYSIS AND OPTIMIZATION **	3
SIEO W3600	INTRO PROBABILITY/STATISTICS (or STAT GU4001)	4

Two electives at or above the 2000 level ***

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MATH UN3951 Undergraduate Seminars in Mathematics I, or an equivalent approved by the Chairs of the Mathematics and Economic departments is an acceptable alternative to ECON BC3063 SENIOR SEMINAR.

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MATH GU4061 INTRO MODERN ANALYSIS I is an acceptable alternative to MATH UN2500 ANALYSIS AND OPTIMIZATION.

MATH UN2030 ORDINARY DIFFERENTIAL EQUATIONS is an approved Mathematics elective. Also approved is MATH UN3951 Undergraduate Seminars in Mathematics I.

Students must obtain approval from each department representative before selecting electives. In exceptional cases, these may be from related fields; other courses can be taken with prior approval.

Cross-Listed Courses

Economics (Barnard)

ECON BC3018 ECONOMETRICS. 4.00 points.

Prerequisites: ECON BC3033 or ECON BC3035, and ECON BC2411 or STAT W1111 or STAT W1211, or permission of the instructor.

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Specification, estimation and evaluation of economic relationships using economic theory, data, and statistical inference; testable implications of economic theories; econometric analysis of topics such as consumption, investment, wages and unemployment, and financial markets

Fall 2022: ECON BC3018

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
ECON 3018	001/00386	T Th 1:10pm - 2:25pm LI03 Diana Center	Morgan Williams	4.00	36/60

Spring 2023: ECON BC3018

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
ECON 3018	001/00391	M W 1:10pm - 2:25pm LI002 Milstein Center	Camilo Rubbini	4.00	54/60

ECON BC3033 Intermediate Macroeconomic Theory. 4 points.

Prerequisites: An introductory course in economics and a functioning knowledge of high school algebra and analytical geometry or permission of the instructor.

Systematic exposition of current macroeconomic theories of unemployment, inflation, and international financial adjustments.

Fall 2022: ECON BC3033

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
ECON 3033	001/00388	T Th 6:10pm - 7:25pm 304 Barnard Hall	Elham Saeidinezhad	4	30/50

Spring 2023: ECON BC3033

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
ECON 3033	001/00375	T Th 11:40am - 12:55pm LI03 Diana Center	Miguel Casares	4	62/70

ECON BC3035 Intermediate Microeconomic Theory. 4 points.

Prerequisites: An introductory course in microeconomics or a combined macro/micro principles course (ECON BC1003 or ECON W1105, or the equivalent) and one semester of calculus or ECON BC1007, or permission of the instructor.

Preferences and demand; production, cost, and supply; behavior of markets in partial equilibrium; resource allocation in general equilibrium; pricing of goods and services under alternative market structures; implications of individual decision-making for labor supply; income distribution, welfare, and public policy. Emphasis on problem solving.

Fall 2022: ECON BC3035

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
ECON 3035	001/00400	T Th 4:10pm - 5:25pm LI03 Diana Center	Lalith Munasinghe	4	37/50

Spring 2023: ECON BC3035

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
ECON 3035	001/00407	T Th 1:10pm - 2:25pm LI04 Diana Center	Lalith Munasinghe	4	43/50

ECON BC3041 Theoretical Foundations of Political Economy. 3 points.

BC: Fulfillment of General Education Requirement: Reason and Value (REA)., BC: Fulfillment of General Education Requirement: Ethics and Values.

Prerequisites: An introductory course in economics or permission of the instructor.

Intellectual origins of the main schools of thought in political economy. Study of the founding texts in classical political economy, Marxian economics, neoclassicism, and Keynesianism.

Fall 2022: ECON BC3041

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
ECON 3041	002/00390	M W 2:40pm - 3:55pm 328 Milbank Hall	David Weiman	3	42/45
ECON 3041	003/00391	M W 10:10am - 11:25am 302 Barnard Hall	David Weiman	3	43/45

Spring 2023: ECON BC3041

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
ECON 3041	001/00409	T Th 2:40pm - 3:55pm 323 Milbank Hall	Belinda Archibong	3	58/58

ECON BC3061 Senior Thesis I. 4 points.

Prerequisites: Permission of the instructor and completion of all courses (except for the senior requirement) required for the economics track, political economy track, or economics and mathematics majors. Exceptions to these prerequisites may be granted by the chair of the department only.

Tutorials and conferences on the research for and writing of the senior thesis. This is the 1st semester of a two-semester course sequence.

Fall 2022: ECON BC3061

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
ECON 3061	001/00393	W 11:00am - 12:50pm Room TBA	Randall Reback	4	6/8
ECON 3061	002/00394	W 6:10pm - 8:00pm 404 Barnard Hall	Alan Dye	4	5/8
ECON 3061	003/00395	W 11:00am - 12:50pm 530 Altschul Hall	Miguel Casares	4	5/8

ECON BC3062 Senior Thesis II. 4 points.

Prerequisites: Permission of the instructor and completion of all courses (except for the senior requirement) required for the economics track, political economy track, or economics and mathematics majors. Exceptions to these prerequisites may be granted by the chair of the department only.

Tutorials and conferences on the research for and writing of the senior thesis. This is the 2nd semester of a two-semester course sequence.

Spring 2023: ECON BC3062

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
ECON 3062	001/00770		Randall Reback	4	6/6
ECON 3062	002/00455	W 6:10pm - 8:00pm 214 Milbank Hall	Alan Dye	4	4/5
ECON 3062	003/00456	W 11:00am - 12:40pm 119 Milstein Center	Miguel Casares	4	4/5
ECON 3062	004/00841		Miguel Casares	4	1/1

ECON BC3063 SENIOR SEMINAR. 4.00 points.

Prerequisites: Permission of the instructor and the completion of all courses (except for the senior requirement) required for the economics track, political economy track, or economics and mathematics majors. Exceptions to these prerequisites may be granted by the chair of the department only. Seminar sections are limited to 15 students. A topic in economic theory or policy of the instructors choice. See department for current topics and for senior requirement preference forms

Fall 2022: ECON BC3063

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
ECON 3063	001/00396	T 10:10am - 12:00pm 407 Barnard Hall	Morgan Williams	4.00	16/16
ECON 3063	002/00397	T 4:10pm - 6:00pm 407 Barnard Hall	Rajiv Sethi	4.00	16/16
ECON 3063	003/00630	W 11:00am - 12:50pm 404 Barnard Hall	Elham Saeidinezhad	4.00	16/16

Spring 2023: ECON BC3063

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
ECON 3063	001/00451	T 2:10pm - 4:00pm 805 Altschul Hall	Anja Tolonen	4.00	15/16
ECON 3063	002/00452	W 2:10pm - 4:00pm LI016 Milstein Center	Homa Zarghamee	4.00	15/16
ECON 3063	003/00453	Th 4:10pm - 6:00pm 227 Milbank Hall	Lalith Munasinghe	4.00	15/16
ECON 3063	004/00454	M 2:10pm - 4:00pm 501 Diana Center	Mulu Gebreyohannes	4.00	10/16

Mathematics

MATH UN1101 CALCULUS I. 3.00 points.

Prerequisites: (see Courses for First-Year Students). Functions, limits, derivatives, introduction to integrals, or an understanding of pre-calculus will be assumed. (SC)

Fall 2022: MATH UN1101

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
MATH 1101	001/12744	M W 11:40am - 12:55pm 203 Mathematics Building	Daniele Alessandrini	3.00	95/110
MATH 1101	002/12746	M W 1:10pm - 2:25pm 702 Hamilton Hall	Michael Thaddeus	3.00	76/85
MATH 1101	003/12748	M W 2:40pm - 3:55pm 417 Mathematics Building	Akash Sengupta	3.00	64/64
MATH 1101	004/12749	M W 4:10pm - 5:25pm 207 Mathematics Building	Akash Sengupta	3.00	108/110
MATH 1101	005/12751	T Th 10:10am - 11:25am 627 Seeley W. Mudd Building	Amadou Bah	3.00	49/52
MATH 1101	006/12752	T Th 11:40am - 12:55pm 633 Seeley W. Mudd Building	Gerhardt Hinkle	3.00	61/70
MATH 1101	008/00057	T Th 1:10pm - 2:25pm 405 Milbank Hall	Lindsay Piechnik	3.00	95/100
MATH 1101	009/12756	M W 6:10pm - 7:25pm 414 Pupin Laboratories	Robin Zhang	3.00	27/30
MATH 1101	010/12758	T Th 4:10pm - 5:25pm 407 Mathematics Building	Chaim Avram Zeff	3.00	33/35
MATH 1101	012/12760	T Th 2:40pm - 3:55pm 825 Seeley W. Mudd Building	Chilin Zhang	3.00	21/30
MATH 1101	013/20176	M W 4:10pm - 5:25pm 428 Pupin Laboratories	Nikolaos Apostolakis	3.00	56/110

Spring 2023: MATH UN1101

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
MATH 1101	001/00020	M W 6:10pm - 7:25pm LI002 Milstein Center	Lindsay Piechnik	3.00	99/100
MATH 1101	002/12019	M W 10:10am - 11:25am 402 Chandler	Marco Castronovo	3.00	44/110
MATH 1101	003/12020	M W 2:40pm - 3:55pm 407 Mathematics Building	Kuan-Wen Chen	3.00	15/30
MATH 1101	004/12021	T Th 11:40am - 12:55pm 312 Mathematics Building	Rostislav Akhmechet	3.00	60/110
MATH 1101	005/12022	T Th 2:40pm - 3:55pm 203 Mathematics Building	Luis Fernandez	3.00	46/110
MATH 1101	006/12023	T Th 4:10pm - 5:25pm 407 Mathematics Building	Chilin Zhang	3.00	10/30

MATH UN1102 CALCULUS II. 3.00 points.

Prerequisites: MATH UN1101 or the equivalent.

Prerequisites: MATH UN1101 or the equivalent. Methods of integration, applications of the integral, Taylors theorem, infinite series. (SC)

Fall 2022: MATH UN1102

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
MATH 1102	001/12761	M W 1:10pm - 2:25pm 203 Mathematics Building	Rostislav Akhmechet	3.00	69/110
MATH 1102	002/12763	M W 2:40pm - 3:55pm 203 Mathematics Building	Rostislav Akhmechet	3.00	68/110
MATH 1102	003/12765	M W 4:10pm - 5:25pm 407 Mathematics Building	Hindy Drillick	3.00	34/35
MATH 1102	004/12767	T Th 10:10am - 11:25am 312 Mathematics Building	Andres Fernandez Herrero	3.00	37/110
MATH 1102	005/12768	T Th 11:40am - 12:55pm 203 Mathematics Building	Andres Fernandez Herrero	3.00	65/110
MATH 1102	006/12771	T Th 6:10pm - 7:25pm 407 Mathematics Building	Haodong Yao	3.00	16/30

Spring 2023: MATH UN1102

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
MATH 1102	001/00021	T Th 2:40pm - 3:55pm 304 Barnard Hall	Lindsay Piechnik	3.00	99/100
MATH 1102	002/12024	M W 1:10pm - 2:25pm 407 Mathematics Building	Ryuichi Haney	3.00	21/30
MATH 1102	003/12025	M W 2:40pm - 3:55pm 417 Mathematics Building	Richard Hamilton	3.00	12/64
MATH 1102	004/12026	M W 6:10pm - 7:25pm 417 Mathematics Building	Elliott Stein	3.00	51/64
MATH 1102	005/12027	T Th 10:10am - 11:25am 203 Mathematics Building	Allen Yuan	3.00	45/100
MATH 1102	006/12028	T Th 11:40am - 12:55pm 203 Mathematics Building	Andres Fernandez Herrero	3.00	17/100
MATH 1102	007/12029	T Th 6:10pm - 7:25pm 417 Mathematics Building	Patrick Lei	3.00	9/30

MATH UN1201 Calculus III. 3 points.

Prerequisites: MATH UN1101 or the equivalent

Vectors in dimensions 2 and 3, complex numbers and the complex exponential function with applications to differential equations, Cramer's rule, vector-valued functions of one variable, scalar-valued functions of several variables, partial derivatives, gradients, surfaces, optimization, the method of Lagrange multipliers. (SC)

Fall 2022: MATH UN1201

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
MATH 1201	001/12774	M W 10:10am - 11:25am 207 Mathematics Building	Tudor Padurariu	3	106/110
MATH 1201	002/12776	M W 11:40am - 12:55pm 207 Mathematics Building	Tudor Padurariu	3	106/110
MATH 1201	003/12778	M W 1:10pm - 2:25pm 312 Mathematics Building	Sam Collingbourne	3	18/110
MATH 1201	004/12779	M W 2:40pm - 3:55pm 312 Mathematics Building	Sam Collingbourne	3	34/110
MATH 1201	005/12781	T Th 11:40am - 12:55pm 142 Uris Hall	Ilya Kofman	3	28/100
MATH 1201	006/12783	T Th 1:10pm - 2:25pm 203 Mathematics Building	Gyujin Oh	3	58/100
MATH 1201	007/12784	T Th 2:40pm - 3:55pm 207 Mathematics Building	Gyujin Oh	3	63/100
MATH 1201	008/12785	T Th 4:10pm - 5:25pm 312 Mathematics Building	George Dragomir	3	109/116

Spring 2023: MATH UN1201

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
MATH 1201	001/12030	M W 10:10am - 11:25am 207 Mathematics Building	Xi Shen	3	47/100
MATH 1201	002/12031	M W 11:40am - 12:55pm 312 Mathematics Building	Chen-Chih Lai	3	61/100
MATH 1201	003/12032	M W 1:10pm - 2:25pm 203 Mathematics Building	Xi Shen	3	81/100
MATH 1201	004/12033	T Th 1:10pm - 2:25pm 207 Mathematics Building	Inbar Klang	3	108/100
MATH 1201	005/12034	T Th 2:40pm - 3:55pm 207 Mathematics Building	Inbar Klang	3	112/100
MATH 1201	006/19536	M W 6:10pm - 7:25pm 203 Mathematics Building	Tomasz Owsiak	3	37/100

MATH UN2010 LINEAR ALGEBRA. 3.00 points.

Prerequisites: MATH UN1201 or the equivalent.

Matrices, vector spaces, linear transformations, eigenvalues and eigenvectors, canonical forms, applications. (SC)

Fall 2022: MATH UN2010

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
MATH 2010	001/00061	T Th 8:40am - 9:55am 328 Milbank Hall	David Bayer	3.00	41/56
MATH 2010	002/00062	T Th 10:10am - 11:25am 328 Milbank Hall	David Bayer	3.00	55/56
MATH 2010	003/12793	M W 10:10am - 11:25am 312 Mathematics Building	Marco Castronovo	3.00	47/100
MATH 2010	004/12794	M W 11:40am - 12:55pm 312 Mathematics Building	Marco Castronovo	3.00	63/100
MATH 2010	005/12796	T Th 4:10pm - 5:25pm 417 Mathematics Building	Elliott Stein	3.00	52/64

Spring 2023: MATH UN2010

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
MATH 2010	001/12504	M W 10:10am - 11:25am 203 Mathematics Building	Amadou Bah	3.00	78/100
MATH 2010	002/12541	M W 11:40am - 12:55pm 203 Mathematics Building	Amadou Bah	3.00	86/100
MATH 2010	003/12543	T Th 1:10pm - 2:25pm 312 Mathematics Building	Jie Jun Morris Ang	3.00	78/100
MATH 2010	004/12546	T Th 4:10pm - 5:25pm 203 Mathematics Building	Konstantin Aleshkin	3.00	58/100
MATH 2010	005/12563	T Th 6:10pm - 7:25pm 203 Mathematics Building	Konstantin Aleshkin	3.00	30/100
MATH 2010	006/15466	M W 6:10pm - 7:25pm Room TBA	Tomasz Owsiak	3.00	0/100

MATH UN2030 ORDINARY DIFFERENTIAL EQUATIONS. 3.00 points.

Prerequisites: MATH UN1102 and MATH UN1201 or the equivalent.

Prerequisites: MATH UN1102 and MATH UN1201 or the equivalent. Special differential equations of order one. Linear differential equations with constant and variable coefficients. Systems of such equations. Transform and series solution techniques. Emphasis on applications

Fall 2022: MATH UN2030

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
MATH 2030	001/12801	M W 1:10pm - 2:25pm 207 Mathematics Building	Konstantin Aleshkin	3.00	77/100
MATH 2030	002/12805	T Th 11:40am - 12:55pm 312 Mathematics Building	Panagiota Daskalopoulos	3.00	43/100
MATH 2030	003/12807	T Th 2:40pm - 3:55pm 312 Mathematics Building	Jorge Pineiro Barcelo	3.00	40/100

Spring 2023: MATH UN2030

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
MATH 2030	001/12573	T Th 10:10am - 11:25am 312 Mathematics Building	Timothy Large	3.00	77/110
MATH 2030	002/12584	T Th 11:40am - 12:55pm 614 Schermerhorn Hall	Florian Johnne	3.00	30/110

MATH UN2500 ANALYSIS AND OPTIMIZATION. 3.00 points.

Prerequisites: MATH UN1102 and MATH UN1201 or the equivalent and MATH UN2010.

Prerequisites: MATH UN1102 and MATH UN1201 or the equivalent and MATH UN2010. Mathematical methods for economics. Quadratic forms, Hessian, implicit functions. Convex sets, convex functions. Optimization, constrained optimization, Kuhn-Tucker conditions. Elements of the calculus of variations and optimal control. (SC)

Fall 2022: MATH UN2500

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
MATH 2500	001/12808	T Th 10:10am - 11:25am 203 Mathematics Building	Xi Shen	3.00	61/100
MATH 2500	002/12809	T Th 11:40am - 12:55pm 326 Uris Hall	Chen-Chih Lai	3.00	20/64

Spring 2023: MATH UN2500

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
MATH 2500	001/12587	M W 1:10pm - 2:25pm 207 Mathematics Building	Julien Dubedat	3.00	20/100
MATH 2500	002/12594	M W 2:40pm - 3:55pm 207 Mathematics Building	Ivan Horozov	3.00	65/100

MATH UN3951 Undergraduate Seminars in Mathematics I. 3 points.

Prerequisites: Two years of calculus, at least one year of additional mathematics courses, and the director of undergraduate studies' permission.

The subject matter is announced at the start of registration and is different in each section. Each student prepares talks to be given to the seminar, under the supervision of a faculty member or senior teaching fellow.

Fall 2022: MATH UN3951

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
MATH 3951	001/00059		Daniela De Silva	3	57/64

MATH GU4061 INTRO MODERN ANALYSIS I. 3 points.

Prerequisites: MATH UN1202 or the equivalent, and MATH UN2010. The second term of this course may not be taken without the first.

Prerequisites: MATH UN1202 or the equivalent, and MATH UN2010.

The second term of this course may not be taken without the first. Real numbers, metric spaces, elements of general topology, sequences and series, continuity, differentiation, integration, uniform convergence, Ascoli-Arzelà theorem, Stone-Weierstrass theorem.

Fall 2022: MATH GU4061

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
MATH 4061	001/12829	T Th 2:40pm - 3:55pm 203 Mathematics Building	Florian Johne	3	49/100
MATH 4061	002/12830	T Th 4:10pm - 5:25pm 203 Mathematics Building	Florian Johne	3	44/100

Spring 2023: MATH GU4061

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
MATH 4061	001/12628	M W 2:40pm - 3:55pm 203 Mathematics Building	Pfeffer Joshua	3	66/100

Statistics**SIEO W3600 INTRO PROBABILITY/STATISTICS. 4.00 points.****STAT GU4001 INTRODUCTION TO PROBABILITY AND STATISTICS. 3.00 points.**

Prerequisites: Calculus through multiple integration and infinite sums.

A calculus-based tour of the fundamentals of probability theory and statistical inference. Probability models, random variables, useful distributions, conditioning, expectations, law of large numbers, central limit theorem, point and confidence interval estimation, hypothesis tests, linear regression. This course replaces SIEO 4150

Fall 2022: STAT GU4001

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
STAT 4001	001/13791	T Th 1:10pm - 2:25pm 207 Mathematics Building	Banu Baydil	3.00	113/152

Spring 2023: STAT GU4001

Course Number	Section/Call Number	Times/Location	Instructor	Points	Enrollment
STAT 4001	001/14242	M W 6:10pm - 7:25pm 209 Havemeyer Hall	Isabella Sanders	3.00	62/86
STAT 4001	002/14243	T Th 6:10pm - 7:25pm 402 Chandler	Carsten Chong	3.00	57/86