MATHEMATICS (MA-GY)

MA-GY 942X Reading in Mathematics II (1-3 Credits)
Typically offered occasionally
In this course, reading is guided by faculty members and devoted mainly to scholarly papers. | Prerequisite: Department's permission.
Grading: Grad Poly Graded
Repeatable for additional credit: Yes
Prerequisites: Graduate Standing.

MA-GY 997X MS Thesis in Math (3-9 Credits)
Typically offered occasionally
In this course, students present a thesis of independent investigation of a suitable problem in mathematics. Study must include adequate investigation of existing literature relating to the subject. Regular reports on progress of work and regular conferences with assigned faculty adviser are required. | Note: Re-registration fee, any part: 3-credit charge. Prerequisite: Degree status.
Grading: Satisfactory/Unsatisfactory
Repeatable for additional credit: Yes
Prerequisites: Graduate Standing.

MA-GY 6213 Intro to Math Analysis I (3 Credits)
Typically offered occasionally
This course and its sequel MA-GY 6223 rigorously treat the basic concepts and results in real analysis. Course topics include limits of sequences, topological concepts of sets for real numbers, properties of continuous functions and differentiable functions. Important concepts and theorems include supremum and infimum, Bolzano-Weierstrass theorem, Cauchy sequences, open sets, closed sets, compact sets, topological characterization of continuity, intermediate value theorem, uniform continuity, mean value theorems and inverse function theorem. | Prerequisite: MA-UY 2122 or permission of adviser.
Grading: Grad Poly Graded
Repeatable for additional credit: No
Prerequisites: Graduate Standing.

MA-GY 6223 Intro to Math Analysis II (3 Credits)
Typically offered occasionally
This course continues MA-GY 6213. The topics are integration, series of real numbers, sequences and series of functions and Fourier series. Important concepts and theorems include Riemann and Riemann-Stieltjes integral, fundamental theorem of calculus, the mean value theorem of integrals, Dirichlet test, absolute and conditional convergence, uniform convergence, Weierstrass test, power series, orthogonal functions and Fourier series. | Prerequisite: MA-GY 6213.
Grading: Grad Poly Graded
Repeatable for additional credit: No
Prerequisites: MA-GY 6213 and graduate standing.

MA-GY 6963 Statistics (3 Credits)
Typically offered Spring
Topics to be covered in this course include various statistical models (sampling model, randomization methods), estimation and margins of error (MLE, confidence intervals, asymptotic theory, efficiency and sufficiency, robustness), likelihood theory (score functions and ratio tests), Bayes theory, decision theory (hypothesis testing, goodness of fit, shrinkage), and finally, an introduction to some common computational methods (bootstrap, Markov Chain-Monte Carlo). | Prerequisites: Undergraduate level proficiency in Linear Algera and Multivariable Calculus. Graduate level proficiency in Probability, at the level of MATH-GA 2901, MA-GY 6813 or ECE-GY 6303.
Grading: Grad Poly Graded
Repeatable for additional credit: No
Prerequisites: Undergraduate level proficiency in Linear Algera and Multivariable Calculus.

MA-GY 6973 Computational Statistics (3 Credits)
Typically offered Fall
Computation plays a central role in modern statistics and machine learning. This course aims to cover topics needed to develop a broad working knowledge of modern computational statistics. We seek to develop a practical understanding of how and why existing methods work, enabling effective use of modern statistical methods. Achieving these goals requires familiarity with diverse topics in statistical computing, computational statistics, computer science, and numerical analysis. Specific topics include: intro to numerical linear algebra, regression and Gaussian processes, Newton's method and optimization, numerical integration, random variable generation, Markov chain Monte Carlo (MCMC) and variance reduction, the Bootstrap, density estimation, and an introduction to modern methods in machine learning (neural networks and deep learning). | Prerequisites: Undergraduate-level proficiency in Linear Algebra and Multivariable Calculus; Undergraduate-level proficiency in Probability and Statistics; Programming Experience required.
Grading: Grad Poly Graded
Repeatable for additional credit: No
Prerequisites: Graduate Standing.

MA-GY 7033 Linear Algebra I (3 Credits)
Typically offered occasionally
This course covers: Basic ideas of linear algebra: Groups, Rings, Fields, vector spaces, basis, dependence, independence, dimension. Relation to solving systems of linear equations and matrices. Homomorphisms, duality, inner products, adjoints and similarity. | Prerequisites: MA-UY 2034 and MA-UY 2114 or Graduate Standing
Grading: Grad Poly Graded
Repeatable for additional credit: No
Prerequisites: MA-UY 2034 and MA-UY 2114 or Graduate Standing.

MA-GY 7043 Linear Algebra II (3 Credits)
Typically offered occasionally
This course continues MA-GY 7033. Topics covered: Basic concepts of linear algebra continuing with: Range, nullity, determinants and eigenvalues of matrices and linear homomorphisms, the polar decomposition and spectral properties of linear maps, orthogonality, adjointness and its applications. | Prerequisite: MA-GY 7033.
Grading: Grad Poly Graded
Repeatable for additional credit: No
Prerequisites: MA-GY 7033 and graduate standing.

MA-GY 9413 Reading in Mathematics I (3 Credits)
Typically offered occasionally
In this course, reading is guided by faculty members and devoted mainly to scholarly papers. | Prerequisite: Department's permission
Grading: Grad Poly Graded
Repeatable for additional credit: Yes
Prerequisites: Graduate Standing.

MA-GY 9423 Reading in Mathematics II (1-3 Credits)
In this course, reading is guided by faculty members and devoted mainly to scholarly papers. | Prerequisite: Department's permission.
Grading: Grad Poly Graded
Repeatable for additional credit: Yes

MA-GY 9453 Readings in Mathematics V (3 Credits)
Typically offered occasionally
In this course, reading is guided by faculty members and devoted mainly to scholarly papers. | Prerequisite: Department's permission
Grading: Grad Poly Graded
Repeatable for additional credit: Yes