MATHEMATICS (MA)

MA 0010 Mathematics for Liberal Arts **3 Credits**
This course presents major mathematical concepts in an historical and cultural setting. Topics include geometry, set theory and logic, along with others that are the choice of the instructor. Students explore the interplay between mathematics, philosophy, and the arts in addition to the more traditional relationship between mathematics and the physical sciences. The course treats mathematics as an art for its aesthetic beauty and as a science, providing a mathematician's view of the subject rather than preparing students for a specific application of mathematics.

MA 0011 Precalculus **3 Credits**
Topics in this course include: algebra; linear, rational, exponential, logarithmic and trigonometric functions from a descriptive, algebraic, numerical and graphical point of view; limits and continuity. Primary emphasis is on techniques needed for calculus. This course does not count toward the mathematics core requirement, and is meant to be taken only by students who are required to take MA 0119, MA 0145, or MA 0171 for their majors, but who do not have a strong enough mathematics background.

MA 0015 Mathematics: An Exploration **3 Credits**
This course introduces various ideas in mathematics at an elementary level. It is meant for the student who would like to fulfill a core mathematics requirement, but who does not need to take mathematics for her or his major. Topics will vary, depending upon the instructor, but in general will include topics of both historical and current interest.

MA 0016 Concepts of Calculus **3 Credits**
This course introduces differentiation and integration, and shows how these ideas are related. The course illustrates how important and interesting applied questions, when expressed in the language of mathematical functions, turn out to be questions about derivatives and integrals and, thus, can be solved using calculus. The basic concepts of calculus are numerically, algebraically, and geometrically investigated, using graphing technology to illustrate many of the underlying geometrical ideas. This is a terminal core course and is not a prerequisite for any other course. Please note that MA 0011 is not an appropriate course to take before taking MA 0016.

MA 0017 Introduction to Probability and Statistics **3 Credits**
This introduction to the theory of statistics includes measures of central tendency, variance, Chebyshev's theorem, probability theory, binomial distribution, normal distribution, the central limit theorem, and estimating population means for large samples. Students who have received credit for any mathematics course at the 100-level or higher may not take this course for credit without the permission of the department chair.

MA 0119 Applied Calculus I **3 Credits**
Prerequisite: Precalculus.
Topics in this course include: foundations of the calculus; differentiation of algebraic, exponential and logarithmic functions; extrema and curve sketching; applications of derivatives; antiderivatives; the Fundamental Theorem of Calculus; and integration of algebraic functions. A graphing calculator and Wolfram Alpha are among the technologies that may be used. Students who received credit for MA 0145 or MA 0171 may not take MA 0119 for credit.

MA 0120 Applied Calculus II **3 Credits**
Prerequisite: MA 0119.
Topics in this course include: applications of the derivative, including implicit differentiation, related rates and linear approximation; integration of algebraic, transcendental and trigonometric functions; differentiation of trigonometric functions; techniques of integration; applications of the definite integral; infinite series. A graphing calculator and Wolfram Alpha are among the technologies that may be used. Students who receive credit for MA 0146 or MA 0172 may not receive credit for MA 0120.

MA 0145 Calculus I for Chemistry, Engineering, and Physics Majors **4 Credits**
Prerequisite: Precalculus.
This course covers analytic geometry; continuous functions; derivatives of algebraic and trigonometric functions, product and chain rules, implicit functions; extrema and curve sketching; indefinite and definite integrals; applications of derivatives and integrals; exponential, logarithmic and inverse trig functions, hyperbolic trig functions, and their derivatives and integrals. It is recommended that students not enroll in MA 0145 unless they have a solid background in high school algebra and precalculus.

MA 0146 Calculus II for Chemistry, Engineering, and Physics Majors **4 Credits**
Prerequisite: MA 0145 or MA 0171.
This course covers applications of the integral to area, arc length, and volumes of revolution; integration by substitution and by parts; indeterminate forms and improper integrals: Infinite sequences and infinite series, tests for convergence, power series, and Taylor series; geometry in three-space.

MA 0151 Functional Programming **3 Credits**
This course provides an introduction to the theory and practice of programming in the functional paradigm. Functional programming is based on a view of programs as data and computing as calculation. This approach facilitates the development of programs that are concise, elegant, and free of broad classes of errors. Topics covered will include a broad introduction to computing, symbolic representation of data, recursion, algebraic data types, the lambda calculus as a model of computing, higher-order functions and type systems. Students will complete the course with both the ability to program and a useful foundation for further study of topics in discrete math, logic, proof, and computer science theory. No prior programming experience is required. May be taken as one course in the core requirement in mathematics.

MA 0171 Calculus I **4 Credits**
Prerequisite: Precalculus.
This is our most rigorous first-year calculus sequence. However, students are not expected to have had calculus before taking this course. Topics include functions; limits (including the epsilon-delta definition), continuity, and derivatives; trigonometric functions and their derivatives; applications; relative and absolute extrema, and curve sketching; related rates; Rolle's Theorem and the mean value theorem; antiderivatives, definite integrals and area, and the fundamental theorem of calculus. It is recommended that students not enroll in MA 0171 unless they have a solid background in high school algebra and precalculus. Students who have received credit for MA 0119 or MA 0145 may not take MA 0171 for credit.

MA 0172 Calculus II **4 Credits**
Prerequisite: MA 0145 or MA 0171.
This course is the continuation of MA 0171. Topics include integration by substitution and by parts; areas between curves; volumes of revolution; inverse functions; logarithms and exponential functions; inverse trigonometric functions; indeterminate forms and l'Hospital's rule; improper integrals; and infinite sequences and series, including convergence tests, absolute and conditional convergence, power series and Taylor series. Students who have received credit for MA 0120 or MA 0146 may not take MA 0172 for credit.

MA 0211 Applied Matrix Theory **3 Credits**
Students majoring in the sciences, economics, and business learn the basic techniques and applications of linear algebra, including solving linear systems of equations, determinants, linear geometry, eigenvalues, and eigenvectors. Closed to mathematics majors. Students may not receive credit for both MA 0211 and MA 0235. Mathematics majors may not take this course as a mathematics requirement or elective.

MA 0217 Accelerated Statistics **3 Credits**
Attributes: EVAP Environmental Studies: Applied Professional Skills
Prerequisite: MA 0119 or MA 0145 or MA 0171.
This introductory, calculus-based statistics course focuses on applications in business, statistics, and everyday events. Topics include descriptive statistics including mean, median, mode, standard deviation, histograms, distributions, box plots, and scatter plots; probability theory including counting rules, random variables, probability distributions, expected values, binomial and normal distributions, and the central limit theorem; inferential statistics including point estimates, confidence intervals, and hypothesis testing; and regression theory. Students learn to analyze data with the aid of common software packages. Mathematics majors may not take this course as a mathematics elective. Students who have received credit for MA 0352 may not take MA 0217 for credit.

MA 0221 Applied Calculus III **3 Credits**
Prerequisite: MA 0120 or MA 0146 or MA 0172.
This course covers first order differential equations, vectors in 2-D and 3-D, partial differentiation and multiple integrals. This is the third course in the three-course sequence MA 0119, MA 0120, MA 0221.

MA 0231 Discrete Mathematics **3 Credits**
Topics in this course include logic; sets; functions; equivalence relations and partitions; mathematical induction; and countability.

MA 0235 Linear Algebra **3 Credits**
Prerequisite: MA 0231.
Students examine linear spaces and subspaces; linear independence and dependence; bases and dimension; linear operators; matrix theory; determinants and systems of linear equations; eigenvalues and eigenvectors. Students may not receive credit for both MA 0211 and MA 0235.

MA 0245 Calculus III for Chemistry, Engineering, and Physics Majors **4 Credits**
Prerequisite: MA 0146 or MA 0172.
Topics include partial differentiation; chain rule, exact differentials, maxima and minima; multiple integration; application to volumes, center of gravity; and polar, cylindrical, and spherical coordinates; vector arithmetic and algebra, dot and cross products, parametric equations, lines and planes; gradient, directional derivative, curl, divergence; line integrals, work, Green's theorem, surface integrals; Stokes's and divergence theorems.

MA 0251 Ordinary Differential Equations **3 Credits**
Prerequisite: MA 0221 or MA 0245 or MA 0273.
This course presents the solution of first order differential equations and of higher order linear differential equations; power series solutions; Laplace transforms; and a multitude of applications. Mathematics majors may not take this course as a mathematics elective. Students who have received credit for MA 0331 may not take MA 0251 for credit.

MA 0273 Multivariable Calculus **4 Credits**
Prerequisite: MA 0172 or MA 0146.
Topics in this course include vectors in the plane and in three-space; equations of lines and planes; vector functions; arc length; functions of several variables, limits, continuity, differentiability and partial derivatives, the gradient, directional derivatives; tangent planes; relative and absolute extrema; multiple integration in cartesian, cylindrical, and spherical coordinates; vector fields; line integrals; Green's theorem.

MA 0300 Topics in Discrete Mathematics **3 Credits**
Prerequisite: MA 0231.
This course builds on the skills developed in MA 0231. Topics include basic combinatorics (permutations, combinations, counting complicated sets, binomial coefficients), elementary number theory (divisors, Euclid's algorithm, modular arithmetic), and elementary graph theory (connectivity, circuits, cycles, planar graphs, graph isomorphisms). Sophomores will have priority registration for this course.

MA 0331 Applied Mathematics **3 Credits**
Prerequisites: MA 0235, MA 0273.
This course covers the theory and solution of ordinary differential equations: first-order equations, linear equations of arbitrary order, and linear systems; power series solutions; Laplace transforms; and existence and uniqueness of solutions. Students who have received credit for MA 0251 may not take MA 0331 for credit.

MA 0332 Partial Differential Equations **3 Credits**
Prerequisites: MA 0245 or MA 0273; MA 0251 or MA 0331.
Topics in this course include first order PDEs and the method of characteristics; separation of variables for linear homogeneous PDEs; eigenvalue problems; Fourier series; solution of the 1-D heat equation, the 1-D wave equation, and the 2-D Laplace equation, both homogeneous and non-homogeneous; and Fourier transforms.

MA 0334 Abstract Algebra **3 Credits**
Prerequisites: MA 0231, MA 0235.
Students study group theory, rings and ideals, integral domains, and fields.

MA 0337 Number Theory **3 Credits**
Attributes: EDCG Educational Studies Cognate
Prerequisite: MA 0231.
This study of the integers includes but is not limited to: primes and their distribution, divisibility and congruences, quadratic reciprocity, special numerical functions such as Euler's one-function, and Diophantine equations. Students consider the influence number theory has had on the development of algebra and the interplay between the two.

MA 0342 Theory of Computation **3 Credits**
Prerequisite: MA 0231.
This course explores what computers can and can't do, although it does not require any background in computer science or programming. Topics include finite state machines, push-down automata, Turing machines and recursive functions; mechanisms for formal languages, such as regular grammars, context-free grammars, context-sensitive grammars; and decidable versus undecidable problems.

MA 0351 Probability Theory **3 Credits**
Attributes: EDCG Educational Studies Cognate
Prerequisites: MA 0231 or CR 0245; MA 0245 or MA 0273.
Topics in this course include counting techniques; axiomatic probability theory; discrete and continuous sample spaces; random variables, cumulative distribution functions, probability density and mass functions; joint distributions; expected value and moments; common distributions like the normal, binomial, and Poisson distributions; and limit laws.

MA 0352 Mathematical Statistics **3 Credits**
Attributes: EDCG Educational Studies Cognate
Prerequisite: MA 0351.
This course covers transformations of random variables; statistical application of probability; theory of sampling and the Central Limit Theorem; variances of sums and averages; estimation and hypothesis testing; and least squares, curve-fitting, and regression.

MA 0354 Actuarial Problem Solving **1 Credit**
Prerequisite: MA 0352 (may be taken concurrently).
This course explores the methods and techniques of solving problems in actuarial mathematics for students interested in the actuary field. This course covers, via student led problem sessions and lectures, the tools for quantitatively assessing risk as presented on Society of Actuaries Exam P.

MA 0361 Topics in Algebra **3 Credits**
Prerequisite: MA 0334.
This course investigates three topics in greater depth than can be done in the first linear or abstract algebra course. Topics may include canonical forms for matrices, metric linear algebra, ideal theory, finite non-abelian groups, and Galois Theory. The course typically includes one linear and one abstract algebra topic.

MA 0371 Real Analysis **3 Credits**
Prerequisites: MA 0231, MA 0273.
This course examines the set of real numbers as a complete, ordered, archimedean field; R as a linear vector space equipped with inner product and norm; metrics, particularly Euclidean, on R, topological concepts: continuity, connectedness, and compactness; the intermediate value, extreme value, monotone convergence, Bolzano/Weierstrass and Heine/Borel theorems; convergence and uniform convergence of sequences of continuous functions; differentiation.

MA 0373 Complex Analysis **3 Credits**
Prerequisites: MA 0231, MA 0273.
Topics in this course include algebra of complex numbers, Cauchy-Riemann equations and analytic functions, complex differentiation, integration in the complex plane, Cauchy's Theorem and integral formula, conformal mapping, Laurent series and residue theory, and applications.

MA 0377 Numerical Analysis **3 Credits**
Prerequisites: MA 0172, MA 0235, proficiency in a computer language.
This course investigates computer arithmetic, round-off errors, the solution of nonlinear equations, polynomial approximation, numerical differentiation and integration, and the solution of systems of linear equations via student-written code to implement the algorithms and/or the use of available software.

MA 0383 Modern Geometry **3 Credits**
Attributes: EDCG Educational Studies Cognate
Prerequisites: MA 0231, MA 0235.
Topics in this course include: foundation for plane geometries; theorems of Menelaus, Ceva, Desargues, Pascal, Brianchon, and Feuerbach; inversion and reciprocation transformations; projective, Riemannian and Lobachevskian geometries; and Poincar' model.

MA 0385 Point Set Topology **3 Credits**
Prerequisite: MA 0371.
This course considers topological spaces, continuous functions; product, metric, and quotient spaces; countability and separation axioms; existence and extension of continuous functions; compactification; metrization theorems and complete metric spaces.

MA 0390 Honors Seminar I **3 Credits**
This course is open to senior mathematics majors with a mathematics GPA of 3.5 or higher and invited junior and senior mathematics majors with demonstrated ability who have been recommended by the mathematics faculty. This seminar provides talented students with an opportunity to undertake individualized study under faculty direction. Participants present several lectures before a group of peers. The seminar's subject matter varies each semester.

MA 0391 Honors Seminar II **3 Credits**
This course is open to senior mathematics majors with a mathematics GPA of 3.5 or higher and invited junior and senior mathematics majors with demonstrated ability who have been recommended by the mathematics faculty. This seminar provides talented students with an opportunity to undertake individualized study under faculty direction. Participants present several lectures before a group of peers. The seminar's subject matter varies each semester.

MA 0395 Special Topics in Mathematics **3 Credits**
Prerequisites: MA 0231; additional mathematics courses depending on the topic.
Mathematical topics not currently among the department's offerings can be offered one-time or to allow a professor the opportunity to "test drive" a course for the first time.

MA 0397 Internship **1-3 Credits**
Prerequisite: Senior standing.
The internship program provides senior mathematics majors with opportunities to gain practical, career-related experience in a variety of supervised field settings. Student interns select from a variety of placements, especially those requiring applications of mathematics, numerical methods, and statistics. Interns spend a minimum of 10 hours per week working at the placement site and complete the required academic component specified by their faculty advisor. Internship credits vary; interns may register for a summer session and/or one or two semesters for an overall maximum of six credits. In addition, an internship must satisfy the requirements outlined in the University Internship Policy, which is available from the Career Planning Center. An internship may not take the place of a mathematics elective. Enrollment by permission only.

MA 0398 Internship **1-3 Credits**
Prerequisite: Senior standing.
The internship program provides senior mathematics majors with opportunities to gain practical, career-related experience in a variety of supervised field settings. Student interns select from a variety of placements, especially those requiring applications of mathematics, numerical methods, and statistics. Interns spend a minimum of 10 hours per week working at the placement site and complete the required academic component specified by their faculty advisor. Internship credits vary; interns may register for a summer session and/or one or two semesters for an overall maximum of six credits. In addition, an internship must satisfy the requirements outlined in the University Internship Policy, which is available from the Career Planning Center. An internship may not take the place of a mathematics elective. Enrollment by permission only.

MA 0399 Independent Study **1-3 Credits**
Independent study provides students with the opportunity to examine areas not covered in the undergraduate curriculum. Under the guidance of a faculty member, advanced students learn about an area in mathematics through reading and research. Independent study includes written work in the form of exercises or papers. Students apply to a professor under whose direction they wish to study and obtain the approval of the department chair. This course may not replace a mathematics elective to fulfill the requirements for the major, unless special permission is given by the department chair.

MA 0401 Introduction to Applied Mathematics **3 Credits**
This course provides an introduction to essential techniques in the study of ordinary differential equations, including separation of variables, characteristic equations for linear equations, variation of parameters and Laplace transforms. The course also includes an introduction to fundamentals of applied linear algebra, including solutions of systems of linear equations, vector spaces, matrices, determinants, eigenvalues and eigenvectors. Students should have a solid undergraduate background through multivariable calculus.

MA 0417 Applied Statistics I **3 Credits**
This course introduces students to the techniques in applied statistical methods as used in the physical sciences, social sciences and business. Topics include probability (reliability, discrete and continuous distributions); descriptive and exploratory statistics using analytic and graphical tools; basic statistical testing (sampling techniques, theory of estimation and standard hypothesis testing); regression analysis (normal linear model, multivariate regression, and model building as time permits); correlation techniques; analysis of variance and factorial designs if time permits; proportion tests, chi-squared analysis and other discrete data techniques as time permits. Included is the use of computer software, such as R, SPSS, and Minitab. Students should have a solid undergraduate background through multivariable calculus.

MA 0418 Applied Statistics II **3 Credits**
Prerequisite: MA 0417.
This course is a continuation of MA 0417, Applied Statistics, and covers additional statistical concepts used in the physical sciences, social sciences, business and health studies. Topics include, but are not limited to, confidence intervals, regression analysis (multiple regression, logistic regression and regression with categorical predictors), analysis of variance (two-way, factorial design, repeated measures and mixed models), analysis of categorical variables (measures of association, chi-squared tests, odds ratio, relative risk, McNemar's test) and non-parametric tests. One statistical package such as R, SPSS and Minitab, will be used throughout the course. Students should have a laptop.

MA 0435 Linear Algebra **3 Credits**
This graduate-level treatment of linear algebra includes general vector spaces; basis and dimension; linear transformations; linear operators and the relationship to matrices; inner product spaces and orthonormalization, least squares approximations, Hilbert spaces; diagonalization and other canonical forms for matrices; eigenvalues, eigenvectors, and applications to ordinary differential equations; and Hermitian, unitary, and positive definite matrices. The course also incorporates a discussion of the historical development of linear algebra, the relationship of linear algebra to analysis, and a coordinated introduction to a symbolic algebra program such as Maple or Mathematica. Students should have a solid background in undergraduate linear algebra or applied matrix theory, which is well-covered by MA 0401.

MA 0436 Abstract Algebra **3 Credits**
This graduate level treatment of abstract algebra with a focus on ring theory includes the integers, the division algorithm divisibility criteria, primes and unique factorization; equivalence relations and congruence classes, modular arithmetic; rings, basic properties of rings, ideals, ring homeomorphisms; ring of polynomials, divisibility algorithm, irreducible elements and unique factorization properties, roots and irreducibility; quotients rings, prime and maximal ideals; Euclidian domains, principal ideals domains, factorization domains, field of quotients of an integral domain; introduction to group theory. Students should have a solid background in theoretical mathematics and linear algebra at the undergraduate level. This is a proof-intensive course.

MA 0451 Probability Theory **3 Credits**
This graduate-level treatment of the theory of probability includes a brief review of probability spaces and finite counting techniques, random variables and distribution functions, density, mass functions, and expectation. The course also examines the standard random variables; multivariate distributions; functions and sums of random variables; limit theorems - weak and strong law of large numbers and the central limit theorem. The course also discusses the historical development of probability. Students should have a solid background in undergraduate mathematics through multivariable calculus, and some familiarity with theory and proof in mathematics.

MA 0452 Statistics Theory **3 Credits**
Prerequisite: MA 0451.
This graduate-level treatment of the theory of mathematical statistics includes theory of estimators, maximum likelihood techniques; theory of estimation; hypothesis testing theory - decision analysis; and Bayesian methods. The course also discusses the historical development of statistics. This is a proof intensive course.

MA 0471 Real Analysis **3 Credits**
This graduate-level treatment of real analysis includes the completeness of the real numbers; the topology of Euclidean n-space and its generalizations to metric and topological spaces; convergence and continuous functions; sequences of functions; general differentiability; the theory of integration and the Lebesgue integral; infinite series and uniform convergence; and a discussion of the historical development of real analysis. Students should have a solid background in undergraduate mathematics through second-semester calculus and theoretical mathematics.

MA 0472 Complex Analysis **3 Credits**
This graduate-level treatment of complex analysis includes the complex number field and its properties; complex analytic functions and their differences with real functions; the complex integral; Cauchy's Theorem and consequences; and a discussion of the historical development of complex analysis. Students should have a solid background in undergraduate mathematics through multivariable calculus and some familiarity with theory in proof in mathematics. This is a proof-intensive course.

MA 0495 Special Topics (Shell) **3 Credits**
Mathematical topics not currently among the department's offerings may be offered once or to allow a professor the opportunity to "test drive" a course for the first time.

MA 0510 Foundations and Set Theory **3 Credits**
The foundations of modern mathematics lie in set theory and logic. This course provides a graduate-level treatment of these areas in the foundation of theoretical mathematics. It is also a good preparation for proof-intensive courses for those without a solid undergraduate foundation in theoretical mathematics. Students should have some familiarity with theory and proof in mathematics.

MA 0531 Dynamical Systems **3 Credits**
This course provides an introduction to the study of dynamical systems from the point of view of both continuous time and discrete time systems. Topics include fixed point and stability analysis for linear and nonlinear flows in one and two dimensions, phase plane analysis, bifurcations and limit cycles, one-dimensional maps, chaos, and Lyapunov exponents. Students should have a solid background in undergraduate mathematics through multivariable calculus, ordinary differential equations, and applied matric theory or linear algebra, which is well-covered by MA 0401.

MA 0532 Partial Differential Equations **3 Credits**
This graduate-level treatment of partial differential equations includes boundary value problems, Fourier series, and Fourier transforms. Students should have a solid background in undergraduate mathematics through multivariable calculus, ordinary differential equations, and applied matric theory or linear algebra, which is well-covered by MA 0401.

MA 0535 Advanced Abstract Algebra **3 Credits**
Prerequisite: MA 0436.
A collection of topics in advanced abstract algebra, this course includes group theory, field extensions and Galois. Students should have a solid background in theoretical mathematics at the undergraduate level and in linear algebra. This is a proof-intensive course.

MA 0537 Number Theory **3 Credits**
This graduate-level survey of the problems and techniques of number theory includes elementary number theory and introductions to analytic and algebraic number theory. Students should have some familiarity with theory and proof in mathematics. This is a proof-intensive course.

MA 0550 Classical Financial Mathematics **3 Credits**
This course covers the basic mathematics of classical financial investments. It will include the basic formulas for compound interest and effective yields, infinite series and exponential functions, annuities and perpetuities, amortization and sinking funds, time value of money, and bond and stock discounts. Students should have a solid background in undergraduate mathematics through second-semester calculus.

MA 0565 Use of Technology in the Classroom **3 Credits**
Designed for teachers, this course surveys various computer software mathematics packages suitable for use in the classroom, such as Maple, Mathematica, MATLAB, SKETCHPAD, and ISETL. The course includes a description of the programs and discusses how they can be integrated into a classroom setting. Students should have a solid background in undergraduate mathematics through second-semester calculus.

MA 0577 Numerical Analysis **3 Credits**
This course provides a graduate-level treatment of numerical analysis and the numerical solution of mathematical problems and includes an introduction to computer implementation of numerical algorithms. Students should have a solid background in undergraduate mathematics through multivariable calculus.

MA 0578 Mathematics of Financial Derivatives **3 Credits**
Prerequisite: MA 0550.
This course covers the theory of financial derivatives, including an explanation of option pricing theory and investments, the idea of financial derivatives, stochastic differential equations, and the Black-Scholes model.

MA 0583 Geometry **3 Credits**
This course offers a graduate-level treatment of Euclidean and non-Euclidean geometry and is highly recommended for teachers. Students should have some familiarity with theory and proof in mathematics. This is a proof-intensive course.

MA 0585 Topology **3 Credits**
Prerequisite: MA 0471.
This course provides an introductory, graduate-level treatment of point-set and algebraic topology and topological methods. This is a proof-intensive course.

MA 0590 Capstone Project **0 Credits**
This is an independent project or presentation planned by the student with the help of a faculty mentor and produced by the student through original work. The project is typically based on the content of a course and is worked on in conjunction with that course, but students can also learn the necessary material in a three-credit independent study with their mentor.

MA 0599 Independent Study **3 Credits**
The Master's Degree Program in Mathematics affords each student the opportunity to do an independent study course with a professor/mentor. This can either be an existing course in the program or a course on an advanced topic in mathematics. In the latter case the syllabus and requirements are developed by the student and the faculty mentor.