MATHEMATICS EDUCATION
M.S.

Degree: Master of Science
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The Master of Science in Mathematics Education program at Towson University provides mathematics teachers with advanced study in mathematics, mathematics education and general education. The program offers teachers additional experience in higher-level mathematics to enhance their teaching with additional depth and breadth of content. At the same time, it strengthens their backgrounds in the school mathematics curriculum, instructional practices, assessment and technology. It also provides them a relevant way of satisfying their in-service requirements for professional advancement.

The program offers two tracks: Secondary School and Middle School.

Secondary School Track
The Secondary School Track is open to certified secondary mathematics teachers with a strong mathematics background. Students take required and elective courses in mathematics content, mathematics education and general areas of education.

It is expected that graduates of this program will become leaders in mathematics education as master teachers, curriculum developers, mathematics supervisors and other positions that improve the teaching of mathematics in secondary schools. The special strength of this program is the opportunity to study higher mathematics content without leaving the field of school mathematics. The program was designed with on-the-job teachers in mind, with part-time studies in the evenings and summers available; however, full-time students are also welcome.

Middle School Track
The Middle School Track is designed to target current and future middle school mathematics teachers who are elementary school certified. Many of these teachers only took mathematics courses that were required for elementary school certification. It is clear that this limited mathematics preparation is not sufficient to teach middle school mathematics.

The primary components of this program are both mathematics content and mathematics education courses. It is clear that middle school mathematics teachers must have a strong mathematics preparation. Moreover, middle school mathematics teachers need to deeply understand the mathematics they teach. Middle school mathematics teachers also need to be lifelong mathematics learners.

Participants in this program will learn mathematics concepts and skills that are meaningful. Techniques that reflect exemplary mathematics teaching also will be presented.

Admission Requirements
Applicants must meet the general requirements for graduate study outlined in this catalog. The applicant must possess current certification for teaching secondary school mathematics (Secondary School Track) or teaching elementary school (Middle School Track). In some circumstances, as determined by the program director, two years of recent, documented, full-time teaching experience may replace the certification requirement. For the Secondary School Track, the applicant should have an undergraduate degree (or MAT) in mathematics with a secondary education concentration or the equivalent, from a regionally accredited college or university**, with a minimum undergraduate GPA of 3.00 for full admission and 2.75 for conditional admission. For the Middle School Track, the applicant should have an undergraduate degree in elementary education or the equivalent from a regionally accredited college or university**, with a minimum undergraduate GPA of 3.00 for full admission and 2.75 for conditional admission. All GPA calculations for admission are based upon the last 60 units of undergraduate and post-baccalaureate study.

Non-immigrant international students: See additional admission information in Graduate Admissions (https://www.towson.edu/academics/graduate/admissions/apply/international.html)

**See Exceptions to Policy in Graduate Admissions (https://www.towson.edu/academics/graduate/admissions/apply/policies.html)

Degree Requirements
The student is required to successfully complete a total of at least 36 units of course work (with no more than 9 units below the 600 level), as outlined below.

Secondary School Track

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<tr>
<th>Code</th>
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<th>Units</th>
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<tr>
<td>Section A: Core Required Courses in Mathematics Education, School Mathematics and Pedagogy</td>
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<td>MATH 602</td>
<td>CULTURAL AND PHILOSOPHICAL BACKGROUND OF MATHEMATICS</td>
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<td>TECHNOLOGY IN SCHOOL MATHEMATICS TEACHING AND LEARNING</td>
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Section B: Courses in General Education and Pedagogy

Students complete a total of three education-related courses. The following are examples of such courses:

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<td>MATH 622</td>
<td>SEMINAR IN TEACHING ADVANCED PLACEMENT CALCULUS</td>
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<td>EDUC 601</td>
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<td>EDUC 605</td>
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<td>EDUC 660</td>
<td>TEACHING IN A MULTICULTURAL SOCIETY</td>
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<td>SCED 625</td>
<td>TEACHING IN THE MIDDLE SCHOOL</td>
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<td>SCED 635</td>
<td>DISCIPLINE AND CLASSROOM MANAGEMENT IN SECONDARY SCHOOLS</td>
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<td>SCED 647</td>
<td>ADVANCED PROCESSES OF TEACHING AND LEARNING</td>
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Section C: Mathematics Foundation

Students complete five courses, one course from each of category and one additional course from any category:

Algebra

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<tr>
<th>Code</th>
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<tr>
<td>MATH 563</td>
<td>LINEAR ALGEBRA</td>
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<tr>
<td>MATH 565</td>
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<td>MATH 568</td>
<td>ALGEBRAIC STRUCTURES</td>
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<td>MATH 667</td>
<td>ALGEBRA OF SYMMETRIES</td>
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Analysis
The document contains a list of courses offered in the Mathematics Education M.S. program. The courses are categorized into Analysis, Geometry, Statistics/Probability, and Mathematics Methods. Each category includes specific courses that students must take to complete the program. The total units required for the program are 36. Additionally, there are sections for Middle School Track and students exiting the graduate program should have an adequate knowledge of mathematics contents in Algebra, Geometry, Calculus and Analysis, Probability and Statistics, Mathematics education principles and standards, and be able to plan a lesson using these principals and standards. The courses are also listed with their descriptions and prerequisites.
MATH 531 PROBABILITY (4)
Probability in sample spaces, discrete and continuous random variables, distribution theory, Tchebychev's theorem, central limit theorem, expected values and moments. Prerequisite: MATH 274.

MATH 532 MATHEMATICAL STATISTICS (3)
Sample theory and distributions, point estimation, confidence intervals, tests of hypothesis, regression, correlation and analysis of variance. Prerequisite: MATH 331 (531).

MATH 533 APPLIED REGRESSION AND TIME SERIES ANALYSIS (4)
Simple and multiple regression models, least squares estimates, hypothesis testing, confidence intervals and prediction intervals, model building methods and diagnostic checking. Non-seasonal time series models: autoregressive, moving-average, autoregressive-moving-average, and/or autoregressive integrated moving-average models, parameter estimation and forecasting. Minitab or a similar software is used for real data analysis. Prerequisite: MATH 265 or equivalent and MATH 332/ MATH 532 or equivalent.

MATH 535 NUMERICAL ANALYSIS I (3)
Error analysis, interpolation, numerical differentiation and integration, numerical solution of algebraic equations and of systems of algebraic equations. Prerequisites: MATH 265, MATH 274 and COSC 236.

MATH 537 OPERATIONS RESEARCH (3)
Introduction to linear, integer and nonlinear programming; the simplex method and interior point methods, duality and sensitivity analysis: formulation of optimizations models and applications to problems from industry. Prerequisites: MATH 211 or MATH 273 and MATH 265.

MATH 538 ACTUARIAL MODELS (3)
Theory of actuarial models and the application of the models to insurance and other financial risks. Survival models, life table, contingent payment models, contingent annuity models, funding plans of contingent contracts, contingent contract reserves, models dependent on multiple survivals, multiple contingencies with applications. Prerequisite: MATH 331.

MATH 539 BIOSTATISTICS II (3)
Probability and random variables, estimation and hypothesis testing, nonparametric methods, categorical data analysis, multiple regression, analysis of variance, and design techniques for epidemiological study. Minitab or a similar software will be used for data analysis. Prerequisites: Math 237 Elementary Biostatistics or equivalent and Math 273 Calculus I or equivalent.

MATH 542 ACTUARIAL MODEL CONSTRUCTION (4)
Introduction to modeling in actuarial mathematics. Construction of frequency - severity models with coverage modifications, aggregate loss models, and discrete-time ruin models. Construction of empirical models using estimators and parametric methods. Introduction to credibility theory. Prerequisites: Math 332 or equivalent.

MATH 548 ADVANCED ACTUARIAL MODELS (3)
Benefit reserves for traditional life insurances and annuities; multiple state models and multiple life functions, premiums and reserves based on these models; multiple decrement models and probabilities; models for cash flow of basic universal life insurance. Prerequisite: MATH 538.

MATH 551 GRAPH THEORY (3)
Statistical process control including principles of control charts, control charts for attributes and variables and special control charts; methods for quality improvement. Acceptance sampling including single, double, multiple and sequential attribute sampling and acceptance sampling by variable. Prerequisite: One course in elementary statistics.

MATH 557 DIFFERENTIAL GEOMETRY (3)
Curvatures of curves and surfaces in E3, geodesics, invariants, mappings and special surfaces. Prerequisites: MATH 275 Calculus III and MATH 265 Eleed. Linear Algebra.

MATH 563 LINEAR ALGEBRA (3)
Vector spaces over arbitrary fields, linear transformations, eigenvalues, eigenvectors, inner products, bilinear forms, direct sum decompositions and the Jordan form. Prerequisites: MATH 265 and MATH 267.

MATH 565 THEORY OF NUMBERS (3)
Topics include congruences, polynomial congruences, primitive roots, residues, and multiplicative functions. Prerequisite: Math 369.

MATH 568 ALGEBRAIC STRUCTURES (3)
Topics include groups, solvability and insolvability of polynomials, principal ideal, Euclidean, and unique factorization domains. Prerequisite: Math 369.

MATH 574 DIFFERENTIAL EQUATIONS (3)

MATH 575 MATHEMATICAL MODELS (3)
Consideration of some mathematical problems in sociology, psychology, economics, management science and ecology, and developing appropriate mathematical models and techniques to solve them.

MATH 576 INTRODUCTORY REAL ANALYSIS (4)
Introduction to mathematical analysis. Sequence series, continuity, differentiation, integration and uniform convergence. Prerequisites: MATH 267 and MATH 275.

MATH 577 COMPLEX ANALYSIS (3)
Complex number system, analytic functions, Cauchy's integral theorem and integral formula, Taylor and Laurent series, isolated singularities, Cauchy's residue theorem and conformal mappings. Prerequisite: MATH 275.

MATH 578 TOPOLOGY (3)
Basic concepts of point set topology, separation axioms, compact and connected spaces, product and quotient spaces, convergence, continuity and homeomorphisms. Prerequisites: MATH 267 and MATH 275.

MATH 579 FOURIER ANALYSIS WITH APPLICATIONS (3)
Vector, integral and differential calculus including the divergence and Stoke's theorems. Fourier series, orthogonal functions and applications. Prerequisite: MATH 275.

MATH 580 SELECTED TOPICS IN MATHEMATICS (1-4)
Topics will be chosen from different areas in mathematics. Content will be determined so as to complement course offerings, as well as the needs and desires of the students. May be repeated for a maximum of 9 units provided a different topic is covered each time. Prerequisite will vary from topic to topic.

MATH 585 MATHEMATICAL FINANCE (3)
Mathematical theory, computation and practical application of derivatives in managing financial risk. Parity and option relationships, binomial option pricing, the Black-Scholes equation and formula, option Greeks, market-making and delta-hedgind, exotic options, lognormal distribution, Brownian motion and ITO's lemma, interest rate models. Computer laboratory activities throughout. Prerequisites: Math 331.
MATH 586 RISK MANAGEMENT AND FINANCIAL ENGINEERING (3)  
Cash flow engineering, Monte Carlo methods, statistical analysis of simulated data, risk measure, framework for fixed income engineering, portfolio management, change of measures and Girsanov Theorem and tools for volatility engineering. Computer laboratory activities throughout. Prerequisite: MATH 485.

MATH 602 CULTURAL AND PHILOSOPHICAL BACKGROUND OF MATHEMATICS (3)  
Meanings and origins of mathematical concepts, schools of philosophical thought, cultural and ethnomathematical context of mathematics, philosophy and purpose of mathematics education, current issues in mathematics and mathematics education, role of the mathematics teacher in current debates. Prerequisite: Admission to master's in Mathematics Education program.

MATH 621 SEMINAR IN TEACHING ELEMENTARY/MIDDLE SCHOOL MATHEMATICS (3)  
Analysis of techniques and materials in elementary and middle school mathematics instruction and assessment. Student may not receive credit for both MATH 621 and MATH 422 except by special permission from the graduate program director and the mathematics department chairperson. Prerequisites: MATH 204, MATH 205, and MATH 251, or their equivalents, all with C or better (MATH 251 or its equivalent may be taken concurrently).

MATH 622 SEMINAR IN TEACHING ADVANCED PLACEMENT CALCULUS (3)  
Discussion and analysis of materials, pedagogy, and technology for the teaching of Advanced Placement Calculus in high schools. Prerequisites: Admitted into the MS program in Mathematics Education or the consent of the instructor.

MATH 625 SEMINAR IN MATHEMATICS EDUCATION FOR SECONDARY SCHOOL TEACHERS (3)  
Investigations of recent curricula and research, pedagogy, materials, technology and assessment techniques for middle and high school teachers of mathematics. Prerequisite: MATH 423 or equivalent.

MATH 626 TECHNOLOGY IN SCHOOL MATHEMATICS TEACHING AND LEARNING (3)  
History and use of technology in teaching mathematics in grades 6 through 12. Students will use scientific and graphing calculators, computers and other devices such as the Calculator-Based Laboratory (CBL) to solve problems found in secondary mathematics curriculum and apply this knowledge in the teaching of mathematical concepts. Software such as Mathematica, MathCad and Geometer's Sketchpad will be studied and students will write lessons using one of these software packages. The use of the Internet and other technological resources to teach mathematics will also be studied. Prerequisite: Admission to the graduate program.

MATH 627 CURRICULUM ISSUES IN SECONDARY SCHOOL MATHEMATICS (3)  
Analyze secondary school mathematics curriculum development from a historical perspective and discuss past influences on current methodology. Distinguish current curriculum trends and design alternatives. Evaluate contemporary curriculum by assessing an existing text or program. Create a selected mathematics unit. Prerequisite: Math 625.

MATH 628 REAL ANALYSIS FOR TEACHERS (3)  
Principles underlying calculus, including topics in real analysis such as completeness for the reals, limits, continuity, differentiation/integration, sequences and series. Emphasis on mathematical theory and the pedagogy of teaching functions. Precalculus and calculus in the secondary school. Prerequisites: Admission to the master's program in Mathematics Education (or approval of department), MATH 273 and MATH 274 or equivalent.

MATH 630 STATISTICS-AN INTEGRATED APPROACH (4)  
Theory and practices of basic statistical analysis and inference with emphasis on analyzing and solving real problems using statistics. Descriptive statistics, introduction to probability, sampling distributions, estimation, hypotheses testing, regression, correlation, nonparametric techniques and analysis of variance, and computer programming incorporated throughout. Prior knowledge of programming is not necessary. Prerequisite: MATH 274 (not open to students who have completed MATH 332).

MATH 631 TOPICS IN PROBABILITY (3)  
Review of basic probability theory, types of convergence and limit theorems, elementary stochastic processes. Markov chains, birth and death processes. Gaussian processes. Examples from engineering, physical and social sciences, management and statistics. Prerequisite: MATH 331.

MATH 632 COMPUTATIONAL STOCHASTIC MODELING (3)  

MATH 633 QUEUING SYSTEMS (3)  
Characterization and analysis of basic queuing systems, both single-server and multiple-server. The M/G/1 and G/M/m queuing systems. Multiserver with queuing, multiserver queuing rules, priority queues. Networks of queues: response time, routing, flow and congestion control. Manufacturing systems: capacity/inventory investment and scheduling. Prerequisites: MATH 331, MATH 531, or consent of chairperson.

MATH 634 COMPUTATIONAL SPECTRAL ANALYSIS AND TIME SERIES (3)  
Random processes, single and double exponential smoothing forecast methods, autoregressive moving average models, maximum likelihood estimation, minimum variance spectral estimation, maximum entropy, periodogram analysis. Computation of spectral estimates; the fast Fourier transform, Yule-Walker equations, Prony’s method. Kalman and adaptive filtering. Mathematica or a similar software package will be used. Prerequisites: MATH 265 and MATH 332, or MATH 532, or consent of chairperson.

MATH 635 APPLIED NUMERICAL ANALYSIS (3)  
MATH 636 LINEAR AND NONLINEAR PROGRAMMING (3)
Formulations and model building in linear programming. The simplex method and its variants: duality theory, sensitivity analysis, polynomial time algorithms, multiobjective optimization models and algorithms. Prerequisite: MATH 265, MATH 275 and graduate standing, or consent of chairperson.

MATH 637 ADVANCED TOPICS IN APPLIED OPERATIONS RESEARCH (3)
Dynamic programming, formulation of deterministic decision-process problems, analytic and computational methods of solution, application to problems of equipment replacement, resource allocation, scheduling, search and routing. Brief introduction to decision making under risk and uncertainty. Prerequisites: MATH 275 and MATH 331, or MATH 531, or consent of chairperson.

MATH 638 APPLIED MULTIVARIATE STATISTICAL ANALYSIS (3)
A brief review of vector and matrix algebra and an introduction to applications of multivariate statistical methods. Multivariate normal distribution and its properties, inference for mean vector of a multivariate normal distribution, and simultaneous inference for components of the mean vector. Principle components, factor analysis, and discrimination & classifications. The course introduces many applications of the topics related to real world problems in the fields of engineering, sciences, and business. Minitab or a similar software is used for real data analysis. Prerequisites: Math 531 or equivalent, Math 533 or equivalent, Math 265 or equivalent.

MATH 639 LOSS MODELS (4)
Severity models, frequency models, aggregate models, survival models, construction of parametric models, and credibility models. Prerequisites: Math 532, or equivalent.

MATH 643 COMPUTATIONAL METHODS OF MATHEMATICAL FINANCE (3)
Mathematics of finance, mathematical models of financial derivatives, derivative pricing, the Greeks of options, Capital Asset Pricing Model, Value-at Risk calculation. Software package such as Mathematica or Excel will be used. Prerequisites: Math 585, or equivalent.

MATH 644 MATHEMATICS OF DERIVATIVES (3)
Modern pricing theory for financial derivatives, stochastic differential equations, Ito formula, martingales, Girsanov Theorem, Feynman-Kac PDE, term structure, Interest-Rate models and derivatives, optimal stopping and American options. Prerequisites: Math 585, or equivalent.

MATH 650 PATTERNS IN MATHEMATICAL DESIGNS (3)
A geometrical bridge between science and art covering topics such as the systems of proportion in mathematics, art, architecture, and in nature; the golden mean, Fibonacci series, Archimedes and logarithmic spirals, growth and similarity in nature; graphs and maps on the Euclidean plane and on a sphere, on a torus, and map coloring; periodic and non-periodic tilings, duality and the modules of semi regular tilings; polyhedra and platonic solids and their duality and combinatorial and space-filling properties. Prerequisite: Admission to the Master's Program in Mathematics Education or approval of the department.

MATH 651 MATHEMATICS OF FUZZY LOGIC (3)
Basic concepts of fuzzy logic, fuzzy sets, fuzzy uncertainty, fuzzy relations, comparing fuzzy logic with first-order predicate logic, algebra of fuzzy logic, approximate reasoning, rule-based systems. Description of linguistic data using fuzzy sets. Applications: rule-based expert systems, decision making, pattern recognition, control theory, optimization. Prerequisite: Graduate standing or consent of chairperson.

MATH 653 TOPICS IN GEOMETRY (3)
Axiomatic development of Euclidean, elliptic and hyperbolic geometries; the study of the analytic plane, the sphere and the Poincare model as models for these axiomatic systems. Not open to students who have had MATH 353. Prerequisites: MATH 274 and MATH 467 (or MATH 568).

MATH 667 ALGEBRA OF SYMMETRIES (3)
Complex integers, permutation groups, properties of abstract groups of plane transformations and matrix representations of transformations. Culminates in developing the 17 groups of symmetries of the Euclidean plane. No credit toward the master's in Applied and Industrial Mathematics. Prerequisite: Admission to the Master of Science in Mathematics Education Program or approval of the department.

MATH 671 CHAOTIC DYNAMICS AND FRACTAL GEOMETRY (3)
Introduction to the classical theory of linear systems and the modern theory of nonlinear and chaotic systems. Modeling of discrete and continuous time systems. Bifurcation theory, symbolic dynamics, fractals and complex dynamics, Julia sets and the Mandelbrot set. Mathematica or an equivalent software package will be used. Prerequisites: MATH 265 and MATH 275, and graduate standing or consent of chairperson.

MATH 673 INTEGRAL TRANSFORMS AND APPLICATIONS (3)
Integral transforms and their applications: Fourier, Laplace, Hankel, Mellin, and z-transforms and their applications for solving ordinary differential equations, partial differential equations, integral equations, and difference equations arisen from physics, engineering and sciences. Prerequisites: MATH 374, (or MATH 574) and MATH 379 (or MATH 579); and MATH 475 (or MATH 577); or consent of chairperson.

MATH 674 APPLIED PARTIAL DIFFERENTIAL EQUATIONS (3)
Discussions of the typical partial differential equations of applied mathematical physics: Heat equations. Wave equations, Beam equations, Laplace equations. Separation of variables, variation of parameters and Fourier transform for initial and boundary value problems, Calculus of variation and Ritz-Galerkin's numerical method. Prerequisite: MATH 374 (or MATH 574), MATH 379 (or MATH 579), or consent of chairperson.

MATH 675 ASYMPTOTIC AND PERTURBATION ANALYSIS (3)
Asymptotic series and asymptotic methods for approximating solutions to linear and nonlinear ordinary differential equations. Asymptotic expansion of integrals; Watson's Lemma. Perturbation series; regular and singular perturbation theory. Boundary layer theory for ordinary differential equations. Prerequisites: MATH 374/ MATH 574 or equivalent and MATH 475/ MATH 577 or equivalent.

MATH 676 INTRODUCTION TO MATHEMATICAL CONTROL THEORY (3)
Problems and specific models of mathematical control theory. Elements of classical control theory: controllability, observability, stability, stabilizability and realization theory for linear and nonlinear systems. Optimal control, Maximum Principle and the existence of optimal strategies. Prerequisites: MATH 265 and MATH 374/MATH 574.

MATH 677 ADVANCED MATHEMATICAL MODELING (3)
Development of appropriate stochastic as well as deterministic models to solve applied mathematical problems in the fields of physics, engineering, and the social sciences. Topics include optimization models, dynamic models, probability models and Monte Carlo simulation. Mathematica or a similar software package will be used. Prerequisites: MATH 331 or MATH 531, and MATH 379 or MATH 579, or consent of chairperson.
MATH 680 SELECTED TOPICS IN MATH EDUCATION (1-4)
Topics will be chosen in mathematics education. Content will be determined to complement graduate course offerings in mathematics education. May be repeated for a maximum of 8 units provided a different topic is taken. No more than 8 units in MATH 680 may be used toward a degree. Prerequisites: will vary from topic to topic.

MATH 684 SELECTED TOPICS IN MATHEMATICS AND STATISTICS (3)
Topics will be chosen in mathematics or statistics. Course content will be determined so as to complement course offerings in mathematics and statistics. Course may be repeated for a maximum of 8 units. Prerequisite: will vary depending on topic.

MATH 685 SELECTED TOPICS IN APPLIED MATHEMATICS (3)
Topics will be chosen in a mathematical field not directly related to differential equations/optimization or applied statistics/mathematical finance. Course content will be determined to complement the existing course offerings. Prerequisite: will vary depending on topic.

MATH 686 SELECTED TOPICS IN DIFFERENTIAL EQUATIONS OR OPTIMIZATION (3)
Topics will be chosen in a mathematical field related to differential equations or optimization. Course content will be determined to complement the existing course offerings in the differential equations/optimization track. Prerequisite: will vary depending on topic.

MATH 687 SELECTED TOPICS IN APPLIED STATISTICS OR MATHEMATICAL FINANCE (3)
Topics will be chosen in a mathematical field related to statistics or mathematical finance. Course content will be determined to complement the existing course offerings in the applied statistics/mathematical finance track. Prerequisite: will vary depending on topic.

MATH 691 SEM MATH APPLCTN (3)

MATH 695 INDEPENDENT STUDY IN MATHEMATICS (1-3)
Directed independent study in selected areas of graduate level mathematics. Prerequisite: Permission of instructor and graduate adviser.

MATH 791 MASTERS INTERNSHIP I (3)
An original investigation of a problem to be pursued in cooperation with a local industry or business under the direction of an industry supervisor and a member of the mathematics faculty. Prerequisites: Completion of at least 15 units toward the M.S. degree in Applied and Industrial Mathematics and consent of chairperson.

MATH 792 MASTER'S INTERNSHIP II (3)
An original investigation of a problem to be pursued in cooperation with a local industry or business under the direction of an industry supervisor and a member of the mathematics faculty. Prerequisites: Completion of at least 15 units toward the M.S. degree in Applied and Industrial Mathematics and consent of chairperson.

MATH 880 APPLIED MATHEMATICS GRADUATE PROJECT I (3)
An internal applied mathematics graduate project based on mutual research interests of a graduate student in the APIM program and a faculty advisor will be investigated. The advisor will guide the student throughout different phases of solving the applied mathematics problem. Prerequisites: permit required, APIM graduate students only.

MATH 885 APPLIED MATHEMATICS GRADUATE PROJECT CONTINUUM (1)
Students who cannot complete Math 880-881 in two semesters will then register for Math 885, one unit, in the next semester. Except in special circumstances, Math 885 cannot be repeated. Prerequisites: Consent of the instructor.

MATH 881 APPLIED MATHEMATICS GRADUATE PROJECT II (3)
An internal applied mathematics graduate project based on mutual research interests of a graduate student in the APIM program and a faculty advisor will be investigated. The advisor will guide the student throughout different phases of solving the applied mathematics problem. Permit required, only APIM graduate students.