MATHEMATICS (MATH)

See Course Description Symbols and Terms (https://catalog.csuchico.edu/academic-standards-policies/course-description-symbols/terms/) for an explanation of course description terminology and symbols, the course numbering system, and course credit units.

- In certain courses, at the discretion of the instructor, you may be required to buy a computer program and/or graphing calculator.
- Completion of the Entry-Level Mathematics (ELM) requirement is a prerequisite for registration in all MATH courses.
- Enrollment in any mathematics course requires a grade of C- or higher in all prerequisite courses or their transfer equivalents.

MATH 5L Foundational Mathematics B 1 Unit
Prerequisite: Credit in Math 031 or GE Math Ready with Support.
Corequisites: MATH 105.
Typically Offered: Fall and spring
Foundational level California Common Core State Standards mathematics topics in support of general education mathematics. This course is a supplemental requirement for Math Ready with Support students required to enroll in designated general education courses. 3 hours laboratory. (005498)
Grade Basis: ABC/No Credit
Repeatability: You may take this course for a maximum of 1 unit
Course Attributes: Pre-Collegiate

MATH 7L Foundational Mathematics B 1 Unit
Prerequisite: Credit in Math 031 or GE Math Ready with Support.
Corequisites: MATH 107.
Typically Offered: Fall and spring
Foundational level California Common Core State Standards mathematics topics in support of general education mathematics. This course is a supplemental requirement for Math Ready with Support students required to enroll in designated general education courses. 3 hours laboratory. (022081)
Grade Basis: ABC/No Credit
Repeatability: You may take this course for a maximum of 1 unit
Course Attributes: Pre-Collegiate

MATH 10L Foundational Mathematics B 1 Unit
Prerequisite: Credit in Math 031 or GE Math Ready with Support.
Corequisites: MATH 110.
Typically Offered: Fall and spring
Foundational level California Common Core State Standards mathematics topics in support of general education mathematics. This course is a supplemental requirement for Math Ready with Support students required to enroll in designated general education courses. 3 hours laboratory. (022082)
Grade Basis: ABC/No Credit
Repeatability: You may take this course for a maximum of 1 unit
Course Attributes: Pre-Collegiate

MATH 10L Foundational Mathematics B 1 Unit
Prerequisite: Credit in Math 031 or GE Math Ready with Support.
Corequisites: MATH 110.
Typically Offered: Fall and spring
Foundational level California Common Core State Standards mathematics topics in support of general education mathematics. This course is a supplemental requirement for Math Ready with Support students required to enroll in designated general education courses. 3 hours laboratory. (022083)
Grade Basis: ABC/No Credit
Repeatability: You may take this course for a maximum of 1 unit
Course Attributes: Pre-Collegiate

MATH 16L Foundational Mathematics B 1 Unit
Prerequisite: Credit in Math 031 or GE Math Ready with Support.
Corequisites: MATH 116.
Typically Offered: Fall and spring
Foundational level California Common Core State Standards mathematics topics in support of general education mathematics. This course is a supplemental requirement for Math Ready with Support students required to enroll in designated general education courses. 3 hours laboratory. (022083)
Grade Basis: ABC/No Credit
Repeatability: You may take this course for a maximum of 1 unit
Course Attributes: Pre-Collegiate

MATH 31B Foundational Mathematics A 1 Unit
Prerequisite: GE Math Ready with Support and Early Start Program.
Corequisites: BIOL 102.
Typically Offered: Fall and spring
Foundational level California Common Core State Standards mathematics topics. Satisfactory completion of this course fulfills the prerequisite for enrollment in Math 005L, MATH 007L, MATH 010L, and MATH 016L. This course is a supplemental requirement for Math Ready with Support, Early Start Program Required students required to enroll in designated general education courses. 3 hours laboratory. (022087)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 1 unit
Course Attributes: Pre-Collegiate

MATH 31G Foundational Mathematics A 1 Unit
Prerequisite: GE Math Ready with Support and Early Start Program.
Corequisites: ERTH 101.
Typically Offered: Fall and spring
Foundational level California Common Core State Standards mathematics topics. Satisfactory completion of this course fulfills the prerequisite for enrollment in Math 005L, MATH 007L, MATH 010L, and MATH 016L. This course is a supplemental requirement for Math Ready with Support, Early Start Program Required students required to enroll in designated general education courses. 3 hours laboratory. (022086)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 1 unit
Course Attributes: Pre-Collegiate

MATH 31N Foundational Mathematics A 1 Unit
Prerequisite: GE Math Ready with Support and Early Start Program.
Corequisites: SCED 101.
Typically Offered: Fall and spring
Foundational level California Common Core State Standards mathematics topics. Satisfactory completion of this course fulfills the prerequisite for enrollment in Math 005L, MATH 007L, MATH 010L, and MATH 016L. This course is a supplemental requirement for Math Ready with Support, Early Start Program Required students required to enroll in designated general education courses. 3 hours laboratory. (005493)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 1 unit
Course Attributes: Pre-Collegiate
MATH 31P  Foundational Mathematics A  1 Unit
Prerequisite: GE Math Ready with Support and Early Start Program.
Corequisites: PSSC 101.
Typically Offered: Fall and spring
Foundation level California Common Core State Standards mathematics topics. Satisfactory completion of this course fulfills the prerequisite for enrollment in Math 005L, MATH 007L, MATH 010L, and MATH 016L. This course is a supplemental requirement for Math Ready with Support, Early Start Program Required students required to enroll in designated general education courses. 3 hours laboratory. (022085)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 1 unit
Course Attributes: Pre-Collegiate

MATH 101  Patterns of Mathematical Thought  3 Units GE
Prerequisite: GE Mathematics/Quantitative Reasoning Ready.
Typically Offered: Fall and spring
An informal approach to mathematics designed to bring an appreciation and workable knowledge of the subject to non-majors. Not acceptable for a mathematics major or minor. 1 hour discussion, 2 hours lecture. (00514)
General Education: Quantitative Reasoning (B4)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Lower Division

MATH 105  Introduction to Statistics  3 Units GE
Prerequisite: GE Mathematics/Quantitative Reasoning Ready.
Typically Offered: Fall and spring
Summary of numerical data, distributions, linear regression, and introduction to statistical inference. Statistical software is used. 1.5 hours discussion, 1.5 hours lecture. (005501)
General Education: Quantitative Reasoning (B4)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Lower Division

MATH 107  Finite Mathematics for Business  3 Units GE
Prerequisite: GE Mathematics/Quantitative Reasoning Ready.
Typically Offered: Fall and spring
Solutions to systems of linear equations, matrices, linear programming, combinatorics, probability, binomial and normal distributions. 1.5 hours discussion, 1.5 hours lecture. (005521)
General Education: Quantitative Reasoning (B4)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Lower Division

MATH 108  Statistics of Business and Economics  3 Units GE
Prerequisite: GE Mathematics/Quantitative Reasoning Ready.
Typically Offered: Fall and spring
Descriptive statistics, sampling theory, statistical inference and tests of hypotheses, analysis of variance, chi-square tests, simple regression and correlation, and multiple regression and correlation. 1.5 hours discussion, 1.5 hours lecture. (001042)
General Education: Quantitative Reasoning (B4)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Lower Division

MATH 109  Survey of Calculus  4 Units GE
Prerequisite: GE Mathematics/Quantitative Reasoning Ready; MATH 118 and MATH 119 (or equivalent) with a C- or higher, or a qualifying score on the department administered calculus readiness assessment in addition to high school trigonometry and precalculus with a C- or higher.
Typically Offered: Fall and spring
This course covers the fundamental concepts and techniques of differential and integral calculus with an introduction to differential equations. Emphasis on applications from the Life Sciences. This course is not intended for majors in mathematics, physics, chemistry, or engineering. No credit for students with credit in MATH 120. A score that meets department guidelines on a department administered calculus readiness exam must be achieved by those who claim high school equivalence. 4 hours discussion. (005512)
General Education: Quantitative Reasoning (B4)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 4 units
Course Attributes: Lower Division

MATH 109X  Survey of Calculus Problem Solving Session  1 Unit
Corequisites: MATH 109.
Typically Offered: Fall and spring
This is a 1-unit supplement to Survey of Calculus, MATH 109. This is structured as a workshop designed to complement MATH 109 students with broader and deeper applications of calculus, providing students with opportunities for additional problem-solving and skill-building in a student-centered collaborative environment. 3 hours independent study. (021280)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 2 units
Course Attributes: Lower Division

MATH 110  Concepts and Structures of Mathematics  3 Units GE
Prerequisite: GE Mathematics/Quantitative Reasoning Ready.
Typically Offered: Fall and spring
Structure of the real number system, operations on real numbers, number theory. Not acceptable for a mathematics major or minor. 3 hours discussion. (005522)
General Education: Quantitative Reasoning (B4)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Lower Division

MATH 116  College Algebra  4 Units GE
Prerequisite: GE Mathematics/Quantitative Reasoning Ready.
Typically Offered: Fall and spring
This course covers advanced algebra concepts beyond the scope of Intermediate Algebra. The topics include algebraic simplifying, conics, theory and solution of equations and inequalities, systems of equations, linear functions, exponential and logarithmic functions, polynomial and rational functions, binomial expansion, and partial fractions. 4 hours lecture. (021954)
General Education: Quantitative Reasoning (B4)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 4 units
Course Attributes: Lower Division
### MATH 117 Hands-On Lab, Mathematics  
2 Units  
**Prerequisite:** MATH 110.  
**Corequisites:** MATH 210 or faculty permission.  
**Typically Offered:** Fall and spring  
The Hands-On Lab for Mathematics provides a rich, sustained, and guided teaching experience for undergraduate students preparing to be elementary or middle school teachers. By developing, refining, and repeatedly teaching a lesson aligned to California mathematics standards, prospective teachers gain insights into the complexities of teaching mathematics content. In addition, prospective teachers engage in Lesson Study with the teachers for these children, thus acquiring experience in a collegial relationship with practicing professionals. 2 hours seminar. (020430)  
**Grade Basis:** Graded  
**Repeatability:** You may take this course for a maximum of 4 units  
**Course Attributes:** Lower Division

### MATH 118 Trigonometry  
3 Units  
**GE**  
**Prerequisite:** GE Mathematics/Quantitative Reasoning Ready.  
**Typically Offered:** Fall and spring  
Trigonometric functions, graphs, identities and conditional equations, logarithms, solutions of triangles, and complex numbers. 3 hours discussion. (005500)  
**General Education:** Quantitative Reasoning (B4)  
**Grade Basis:** Graded  
**Repeatability:** You may take this course for a maximum of 3 units  
**Course Attributes:** Lower Division

### MATH 119 Precalculus Mathematics  
4 Units  
**GE**  
**Prerequisite:** GE Mathematics/Quantitative Reasoning Ready, and either 1/2 year of high school trigonometry or MATH 118 (may be taken concurrently).  
**Typically Offered:** Fall and spring  
Functions and graphs, including polynomial, rational, exponential, logarithmic, and trigonometric functions. Systems of equations and inequalities, polar and parametric equations, complex numbers, and analytic trigonometry. 4 hours discussion. (005504)  
**General Education:** Quantitative Reasoning (B4)  
**Grade Basis:** Graded  
**Repeatability:** You may take this course for a maximum of 4 units  
**Course Attributes:** Lower Division

### MATH 119X Precalculus Problem Session  
1 Unit  
**Prerequisite:** Faculty permission.  
**Corequisites:** MATH 119.  
**Typically Offered:** Fall and spring  
Designed to supplement MATH 119 with additional applications. Provides the student with the opportunity for additional assistance in developing problem-solving abilities. 3 hours independent study. (005505)  
**Grade Basis:** Credit/No Credit  
**Repeatability:** You may take this course for a maximum of 3 units  
**Course Attributes:** Lower Division

### MATH 120 Analytic Geometry and Calculus  
4 Units  
**GE**  
**Prerequisite:** GE Mathematics/Quantitative Reasoning Ready; MATH 118 and MATH 119 (or equivalent) with a C- or higher, or a qualifying score on the department administered calculus readiness assessment in addition to high school trigonometry and precalculus with a C- or higher.  
**Typically Offered:** Fall and spring  
Limits and continuity. The derivative and applications to related rates, maxima and minima, and curve sketching. Transcendental functions. An introduction to the definite integral and area. 4 hours discussion. (005506)  
**General Education:** Quantitative Reasoning (B4)  
**Grade Basis:** Graded  
**Repeatability:** You may take this course for a maximum of 4 units  
**Course Attributes:** Lower Division

### MATH 120X Calculus Problem Session  
1 Unit  
**Prerequisite:** Faculty permission.  
**Corequisites:** MATH 120.  
**Typically Offered:** Fall and spring  
Designed to supplement MATH 120 with additional applications of introductory calculus. Provides the student with the opportunity for additional assistance in developing problem-solving abilities. 3 hours independent study. (005510)  
**Grade Basis:** Credit/No Credit  
**Repeatability:** You may take this course for a maximum of 3 units  
**Course Attributes:** Lower Division

### MATH 121 Analytic Geometry and Calculus  
4 Units  
**Prerequisite:** MATH 120.  
**Typically Offered:** Fall and spring  
The definite integral and applications to area, volume, work, differential equations, etc. Sequences and series, vectors and analytic geometry in 2 and 3-space, polar coordinates, and parametric equations. 4 hours discussion. (005507)  
**Grade Basis:** Graded  
**Repeatability:** You may take this course for a maximum of 4 units  
**Course Attributes:** Lower Division

### MATH 121X Calculus Problem Session  
1 Unit  
**Prerequisite:** Concurrent enrollment in MATH 121, faculty permission.  
**Typically Offered:** Fall and spring  
Designed to supplement MATH 121 with additional applications and expanded explanations of concepts encountered in second-semester calculus. Provides the student with the opportunity for additional assistance in coming to an understanding of the concepts of calculus. 3 hours independent study. (005511)  
**Grade Basis:** Credit/No Credit  
**Repeatability:** You may take this course for a maximum of 3 units  
**Course Attributes:** Lower Division

### MATH 125 Advanced Number and Operation  
3 Units  
**Prerequisite:** Successful completion of high school precalculus, concurrent enrollment in MATH 118 or 119, or faculty permission.  
**Typically Offered:** Fall only  
Investigate number and operation through calculation and abstraction, find patterns and relationships through computation, develop and test mathematical conjectures, and develop an appreciation of proof and an ability to make mathematical arguments. Basic concepts from Number Theory are explored, culminating in proof of the Fundamental Theorem of Arithmetic and related theorems in other number sets. 3 hours discussion. (021846)  
**Grade Basis:** Graded  
**Repeatability:** You may take this course for a maximum of 3 units  
**Course Attributes:** Lower Division
MATH 130  Introduction to R  1 Unit
Typically Offered: Fall and spring
This accelerated short-course is designed as a primer to get the complete novice up and running with the basic knowledge of how to use the statistical programming language R. Target audience is anyone who wants to become the boss of their own data and conduct their own analysis. We cover how to get data into R, how to manipulate it into an analyzable format, and how to create informative plots. Emphasis is placed on reproducibility and literate programming. The course culminates with a data exploration project. This course requires the use of a laptop computer and appropriate software. Typically offered as 3 hour discussion for 5 weeks. 1 hour discussion. (021774)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 2 units
Course Attributes: Lower Division; Laptop required

MATH 185  Data Analytics for Social Good  3 Units  GE
Prerequisite: GE Mathematics/Quantitative Reasoning Ready.
Typically Offered: Fall and spring
This course introduces students how to start harnessing the power of data to intelligently cope with the requirements of citizenship, employment, and family to be prepared for a healthy, happy and productive life. Students practice collecting and wrangling data into a usable form, visualizing large data sets to discover patterns, representing data in a meaningful way, exploring varying interpretations of the data and results, and discussing potentials for misuse and abuse. This course promotes critical reflection on the ethical, social, cultural, and political dimensions of data as well as providing direct hands on experience with both spreadsheets, and the programming language R. Students from all majors are welcome, no prior programming experience is expected. 1 hour activity, 2 hours lecture. (022285)
General Education: Quantitative Reasoning (B4)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Lower Division; Laptop required

MATH 195  Project MATH Seminar Year 1  1 Unit
Typically Offered: Fall and spring
The Project M.A.T.H. Seminar - Year 1 is a biweekly seminar for students in their first year of Project M.A.T.H., an innovative program for students interested in becoming secondary mathematics teachers. Students work with mentor teachers, prepare and present lessons, and participate in a structured early field experience. Completion of the seminar series satisfies the Credential Program's Early Field Experience requirement. 1 hour seminar. (020431)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 2 units
Course Attributes: Lower Division

MATH 198  Special Topics  1-3 Units
Prerequisite: GE Mathematics/Quantitative Reasoning Ready.
Typically Offered: Fall and spring
This course is for special topics offered for 1.0-3.0 units. Typically the topic is offered on a one-time-only basis and may vary from term to term and be different for different sections. See The Class Schedule for the specific topic being offered. 3 hours discussion. (005528)
Grade Basis: Graded
Repeatability: You may take this course more than once
Course Attributes: Lower Division
MATH 225  Algebra Functions, Real and Complex Number Systems  3 Units
Prerequisite: MATH 125.
Typically Offered: Spring only
This course focuses on developing your abilities in making sense of algebraic manipulation in the context of functions, polynomial rings, and matrices. The course and the classroom are structured as a supportive, collaborative learning environment in which mathematical discourse is valued and exploration encouraged. You will investigate algebra and polynomials through calculation and abstraction, find patterns and relationships through computation, develop and test mathematical conjectures, and develop an appreciation of proof and an ability to construct mathematical arguments. More advanced concepts from Number Theory are explored, culminating in proofs of the Unique Prime Factorization Theorem and the Division Algorithm for different rings. 3 hours discussion. (021953)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Lower Division

MATH 230  An Introduction to Computational Mathematics  3 Units
Prerequisite: MATH 121, no previous computer experience required.
Typically Offered: Fall only
An introduction to the use of mathematical computer software. This course provides an introduction to a programming environment, preparing math majors to use computers to explore and solve varied math problems. The software used in this class depends on the instructor and may be chosen from Mathematica, GP/PARI, GAP, SAS, R, etc. This course satisfies the computer literacy requirement for mathematics majors. 3 hours discussion. (005526)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 9 units
Course Attributes: Lower Division

MATH 235  Elementary Linear Algebra  3 Units
Prerequisite: MATH 121.
Typically Offered: Fall and spring
Matrices, determinants, cartesian n-space (basis and dimension of a subspace, rank, change of basis), linear transformations, eigenvalues. Numerical problems will be emphasized. 3 hours discussion. (005553)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Lower Division

MATH 241  Secondary Math Early Field Experience  1 Unit
Typically Offered: Fall and spring
This seminar and the associated CAVE field experience give prospective teachers early exposure to issues relevant to the profession of teaching secondary mathematics. In particular, the experience helps these future teachers develop a deeper understanding of the K-12 mathematics curriculum, understand connections between their university subject matter preparation and K-12 academic content, and reflect on developmental and social factors that affect K-12 students’ learning of mathematics. 1 hour seminar. (020432)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 4 units
Course Attributes: Lower Division

MATH 245  Elementary Textbook Problem Session  1 Unit
Typically Offered: Spring only
Students work with mentor teachers, prepare and present lessons, and learn to lead a mathematics classroom. This seminar and the associated CAVE field experience give prospective teachers early exposure to issues relevant to the profession of teaching secondary mathematics. In particular, the experience helps these future teachers develop a deeper understanding of the K-12 mathematics curriculum, understand connections between their university subject matter preparation and K-12 academic content, and reflect on developmental and social factors that affect K-12 students’ learning of mathematics. 1 hour seminar. (020432)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 4 units
Course Attributes: Lower Division

MATH 250  Mathematics and Statistics Tutoring  1 Unit
Corequisites: Concurrent enrollment in a course offered through the Dept of Mathematics at CSU, Chico.
Typically Offered: Fall and spring
This course provides supplemental mathematics statistics tutoring. 3 hours independent study. (020823)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 8 units
Course Attributes: Lower Division

MATH 260  Elementary Differential Equations  4 Units
Prerequisite: MATH 121.
Typically Offered: Fall and spring
First order separable, linear, and exact equations; second order linear equations, Laplace transforms, series solutions at an ordinary point, systems of first order linear equations, and applications. 4 hours discussion. (005509)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 4 units
Course Attributes: Lower Division

MATH 260X  Elementary Differential Equations Problem Session  1 Unit
Corequisites: MATH 260.
Typically Offered: Fall and spring
Typically Offered: Fall and spring
This course provides supplemental mathematics statistics tutoring. 3 hours independent study. (005509)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 8 units
Course Attributes: Lower Division

MATH 290  Mathematics and Statistics Tutoring  1 Unit
Typically Offered: Fall and spring
Designed to supplement MATH 260 with broader and deeper applications of differential equations, providing the student with opportunities for additional problem-solving skills. A minimum of 20 hours of activity are required to earn credit for the class; forty hours are available. 3 hours independent study. (020315)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 8 units
Course Attributes: Lower Division

MATH 295  Project M.A.T.H. Seminar Year 2  1 Unit
Prerequisite: MATH 195.
Typically Offered: Fall and spring
The Project M.A.T.H. Seminar - Year 2 is the continuation of a biweekly seminar for students in Project M.A.T.H., an innovative program for students interested in becoming secondary mathematics teachers. Students work with mentor teachers, prepare and present lessons, and participate in a structured early field experience. They also take on a leadership role in the seminar. Completion of the seminar series satisfies the Credential Program's Early Field Experience requirement. 1 hour seminar. (020433)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 2 units
Course Attributes: Lower Division

MATH 298  Special Topics  1-3 Units
Typically Offered: Inquire at department
This course is for special topics offered for 1.0 - 3.0 units. Typically the topic is offered on a one-time-only basis and may vary from semester to semester and be different for different sections. See the class schedule for the specific topic being offered. 0 hours supervision. (021615)
Grade Basis: Graded
Repeatability: You may take this course more than once
Course Attributes: Lower Division
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Prerequisite</th>
<th>Typically Offered</th>
<th>Grade Basis</th>
<th>Repeatability</th>
<th>Course Attributes</th>
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<tbody>
<tr>
<td>MATH 299</td>
<td>Special Problems</td>
<td>1-3</td>
<td>Faculty permission.</td>
<td>Inquire at department</td>
<td>Credit/No Credit</td>
<td>You may take this course for a maximum of 6 units</td>
<td>Lower Division</td>
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<td>MATH 300</td>
<td>Undergraduate Mathematics Seminar</td>
<td>2</td>
<td>GE Mathematics/Quantitative Reasoning Ready.</td>
<td>Fall and spring</td>
<td>Credit/No Credit</td>
<td>You may take this course for a maximum of 8 units</td>
<td>Upper Division</td>
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<td>MATH 305</td>
<td>Conceptual and Practical Statistics</td>
<td>3</td>
<td>MATH 120 or MATH 109 (may be taken concurrently).</td>
<td>Spring only</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Upper Division</td>
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<td>MATH 310</td>
<td>Patterns and Structures in Mathematics</td>
<td>3</td>
<td>MATH 110; MATH 210 or MATH 225.</td>
<td>Fall and spring</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Upper Division</td>
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<td>MATH 311</td>
<td>Intuitive Foundations of Geometry</td>
<td>3</td>
<td>MATH 110, MATH 210; or MATH 225.</td>
<td>Spring only odd years</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Upper Division</td>
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<td>MATH 314</td>
<td>Probability and Statistics for Science and Technology</td>
<td>4</td>
<td>MATH 121; and one of the following: CSCI 111, MATH 130 (may be taken concurrently), MATH 230 or MECH 208.</td>
<td>Fall and spring</td>
<td>Graded</td>
<td>You may take this course for a maximum of 4 units</td>
<td>Upper Division; Laptop required</td>
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<td>MATH 315</td>
<td>Applied Statistical Methods I</td>
<td>3</td>
<td>MATH 105, MATH 109, or MATH 120, or faculty permission.</td>
<td>Fall and spring</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Upper Division</td>
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<td>MATH 317</td>
<td>Cryptography</td>
<td>4</td>
<td>CSCI 111; MATH 217 or MATH 330W.</td>
<td>Spring only</td>
<td>Graded</td>
<td>You may take this course for a maximum of 4 units</td>
<td>Upper Division</td>
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MATH 330W Methods of Proof (W) 3 Units W
Prerequisite: GE Written Communication (A2) requirement and MATH 121.
Typically Offered: Fall and spring
A survey of elementary principles of logic, emphasizing the nature of proof. Standard methods of proof will be illustrated with examples from various branches of mathematics, including set theory and the theory of functions and relations. Other possible sources of examples include the calculus, number theory, theory of equations, topology of the real line. 3 hours seminar. (005530)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Writing Course

MATH 333 History of Mathematics 3 Units
Prerequisite: MATH 121; MATH 220 or MATH 225; and at least one upper division mathematics course. Recommended: MATH 330W.
Typically Offered: Spring only
Study of the historical development of mathematics, with particular emphasis on the relationship between mathematics and society. 3 hours discussion. (005531)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

MATH 337 Introduction to the Theory of Numbers 3 Units
Prerequisite: MATH 121, MATH 330W.
Typically Offered: Fall only
Basic properties of the integers, division algorithm, fundamental theorem of arithmetic, number-theoretic functions, Diophantine equations, congruences, quadratic residues, continued fractions. 3 hours discussion. (005585)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

MATH 341 Mathematical Topics for the Credential 3 Units
Prerequisite: MATH 121 or MATH 225.
Typically Offered: Fall only
This course is designed to supplement the mathematical background of the candidate for the single subject credential in mathematics. The mathematical topics will be discussed from the student's and the teacher's points of view to aid the candidate in making the transition to secondary school mathematics. Topics include mathematical problem-solving, conceptual ideas using algebra, geometry, and functions, incorporating technology into the mathematics curriculum, and finite systems. 3 hours seminar. (005544)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

MATH 342 Math Topics for the Credential 3 Units
Prerequisite: MATH 341.
Typically Offered: Spring only
This course focuses on having students examine mathematical pedagogy and the understanding and evaluations of students as mathematical learners as it analyzes secondary mathematics curriculum from an advanced standpoint. Students will have opportunities to be involved in the facilitation of mathematical learning. Topics include: history of mathematics education, contemporary mathematics curricula, problem solving, mathematical reasoning and methods of proof, mathematical learning theories, communication, assessment and collaborative learning communities. 3 hours discussion. (005545)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

MATH 344 Graph Theory 3 Units
Prerequisite: MATH 121; CSCI 217, MATH 217, or MATH 330W.
Typically Offered: Spring only odd years
An introduction to graph theory and network theory. Directed graphs, trees, connectivity, duality, coloring, and planarity are studied both from a theoretical perspective as well as with respect to efficient algorithms. 3 hours discussion. (005591)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

MATH 346 College Geometry 3 Units
Prerequisite: MATH 220 or MATH 225; MATH 330W.
Typically Offered: Spring only
An exploration of axioms and models for Euclidean and non-Euclidean geometries focusing on the independence of the Parallel Postulate. Additional topics will be chosen from Euclidean plane geometry, transformation geometry, and the geometry of polyhedra. 3 hours discussion. (005561)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

MATH 350 Introduction to Probability and Statistics 3 Units
Prerequisite: MATH 121.
Typically Offered: Fall and spring
Basic concepts of probability theory, random variables and their distributions, limit theorems, sampling theory, topics in statistical inference, regression, and correlation. 3 hours discussion. (005534)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

MATH 351 Introduction to Probability and Statistics 3 Units
Prerequisite: MATH 350.
Typically Offered: Spring only
Continuation of MATH 350. 3 hours discussion. (005535)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division
MATH 360  Ordinary Differential Equations  3 Units
Prerequisite: MATH 260.
Typically Offered: Spring only
Systems of first order linear equations, existence and uniqueness theorems, stability, Sturm separation theorems, power series methods. 3 hours discussion. (005538)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

MATH 361  Boundary Value Problems and Partial Differential Equations  3 Units
Prerequisite: MATH 260.
Typically Offered: Fall only
Partial differential equations, separation of variables, orthogonal sets of functions, Sturm-Liouville problems, Fourier series, boundary value problems for the wave equation, heat equation, and Laplace equation; Bessel functions, Legendre polynomials. 3 hours discussion. (005540)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

MATH 385  Introduction to Data Science  3 Units
Prerequisite: CSCI 111, MATH 130, or MATH 230; MATH 109 or MATH 120.
Typically Offered: Fall only
Data Science is the science of learning from data in order to gain useful predictions and insights. The course provides an overview of the wide area of data science, with a particular focus on the tools required to store, clean, manipulate, visualize, model, and ultimately extract information from various sources of data. Topics include the analytics life cycle, data integration and modeling in R/Python, relational databases and SQL, text processing and sentiment analysis, and data visualization. Emphasis is placed on reproducible research, code sharing, version control, and communicating results to a non-technical audience. 3 hours discussion. (021756)
Cross listing(s): CSCI 385
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

MATH 398  Special Topics in Math  1-3 Units
Prerequisite: At least one 100- or 200-level mathematics course appropriate to the subject, faculty permission.
Typically Offered: Fall and spring
This course is for special topics offered for 1.0-3.0 units. Typically the topic is offered on a one-time-only basis and may vary from term to term and be different for different sections. See the Class Schedule for the specific topic being offered. 9 hours supervision. (005559)
Grade Basis: Graded
Repeatability: You may take this course more than once
Course Attributes: Upper Division

MATH 399  Special Problems  1-3 Units
Typically Offered: Fall and spring
This course is an independent study of special problems offered for 1.0-3.0 units. You must register directly with a supervising faculty member. MATH 399 cannot be used to fulfill major requirements without prior approval of the advisor and department chair. 0 hours supervision. (005560)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 6 units
Course Attributes: Upper Division

MATH 401  CMP Institute - Summer 1  2 Units
Typically Offered: Summer session only
CMP Institute - Summer 1 2 hours discussion. (005578)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 4 units
Course Attributes: Upper Division

MATH 405  Cmp Institute-Sp  1 Unit
Typically Offered: Spring only
1 hour lecture. (005552)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 6 units
Course Attributes: Upper Division

MATH 407  CMP Institute - Summer 2  1 Unit
Typically Offered: Summer session only
1 hour discussion. (005579)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 2 units
Course Attributes: Upper Division

MATH 420W  Advanced Calculus (W)  3 Units W, GW
Prerequisite: GE Written Communication (A2) requirement, MATH 220, MATH 330W, upper-division standing.
Typically Offered: Fall and spring
Limits, continuity, uniform continuity, the definite integral, series, convergence, uniform convergence, and metric spaces. Differentiation and integration of functions of several variables. Transformation of multiple integrals. 3 hours discussion. (005575)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Writing Course; Graduation Writing Assessment

MATH 421  Advanced Calculus  3 Units
Prerequisite: MATH 420W.
Typically Offered: Spring only
Continuation of MATH 420W. 3 hours discussion. (005576)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

MATH 425W  Computational and Communication in Mathematical Modeling (W)  3 Units W, GW
Prerequisite: GE Written Communication (A2) requirement, completion of computer literacy requirement, MATH 225, MATH 235, MATH 330W, and upper division standing.
Typically Offered: Fall only
In this course, intended for pre-service teachers, student experience mathematical modeling with content common in the secondary setting (algebra through calculus) as well as from their undergraduate coursework and develop and produce formal modeling reports. Students use technology to aid in exploring real-world circumstances, make sense of and analyze existing models, and develop their own mathematical models. 3 hours discussion. (021977)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Writing Course; Graduation Writing Assessment
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<tr>
<th>Course Title</th>
<th>Units</th>
<th>Prerequisite</th>
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<th>Grade Basis</th>
<th>Repeatability</th>
<th>Course Attributes</th>
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<tbody>
<tr>
<td>MATH 428 Differential Geometry</td>
<td>3</td>
<td>Prerequisite: MATH 220, MATH 330W.</td>
<td>Fall only odd years</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Upper Division</td>
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<tr>
<td>MATH 435 Linear Algebra</td>
<td>3</td>
<td>Prerequisite: MATH 220, MATH 235, MATH 330W.</td>
<td>Spring only even years</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Upper Division</td>
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<tr>
<td>MATH 437 Topology</td>
<td>3</td>
<td>Prerequisite: MATH 220, MATH 330W.</td>
<td>Fall only even years</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Upper Division</td>
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<tr>
<td>MATH 441 Math Topics for the Credential</td>
<td>4</td>
<td>Corequisites: Assignment as a Mathematics Department intern.</td>
<td>Fall and spring</td>
<td>Credit/No Credit</td>
<td>You may take this course for a maximum of 8 units</td>
<td>Upper Division</td>
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<tr>
<td>MATH 442 Mathematics and the Teaching of Mathematics</td>
<td>3</td>
<td>Prerequisite: MATH 342.</td>
<td>Fall only</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Upper Division</td>
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<tr>
<td>MATH 449 Modern Algebra</td>
<td>3</td>
<td>Prerequisite: MATH 220, MATH 235, MATH 330W.</td>
<td>Fall only</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Upper Division</td>
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<tr>
<td>MATH 450 Mathematical Statistics</td>
<td>3</td>
<td>Prerequisite: MATH 220, MATH 330W, MATH 351.</td>
<td>Fall only</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Upper Division</td>
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<tr>
<td>MATH 451 Modern Algebra II</td>
<td>3</td>
<td>Prerequisite: MATH 449.</td>
<td>Spring only odd years</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Upper Division</td>
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<tr>
<td>MATH 452 Advanced Statistical Methods II</td>
<td>3</td>
<td>Prerequisite: MATH 314 or MATH 315.</td>
<td>Spring only odd years</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Upper Division</td>
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<tr>
<td>MATH 453 Sampling Methods</td>
<td>3</td>
<td>Prerequisite: MATH 314, MATH 315, or MATH 351 (may be taken concurrently).</td>
<td>Spring only odd years</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Upper Division</td>
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<td>Course Code</td>
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<td>MATH 461</td>
<td>Numerical Analysis</td>
<td>3</td>
<td>MATH 220 or MATH 260; completion of computer literacy requirement.</td>
<td>Spring only</td>
<td>Upper Division</td>
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<tr>
<td>MATH 465</td>
<td>Introduction to Complex Variables</td>
<td>3</td>
<td>MATH 220.</td>
<td>Fall only</td>
<td>Upper Division</td>
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<tr>
<td>MATH 472</td>
<td>Introduction to Chaotic Dynamical Systems</td>
<td>3</td>
<td>MATH 260. Recommended: MATH 235, MATH 360.</td>
<td>Fall only odd years</td>
<td>Upper Division</td>
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<tr>
<td>MATH 475</td>
<td>Calculus of Variations</td>
<td>3</td>
<td>MATH 260; MATH 361 is recommended.</td>
<td>Fall only even years</td>
<td>Upper Division</td>
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<tr>
<td>MATH 480</td>
<td>Mathematical Modeling</td>
<td>3</td>
<td>MATH 235, MATH 260.</td>
<td>Spring only</td>
<td>Upper Division</td>
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<tr>
<td>MATH 485</td>
<td>Advanced Topics in Data Science</td>
<td>3</td>
<td>CSCI 385 or MATH 385; MATH 456 (may be taken concurrently).</td>
<td>Spring only</td>
<td>Upper Division</td>
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<td>MATH 490</td>
<td>Data Science Capstone</td>
<td>1-3</td>
<td>MATH 485, senior standing, approved project, enrollment in the Data Science Certificate Program</td>
<td>Fall only</td>
<td>Upper Division</td>
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<td>MATH 495H</td>
<td>Honors Reading Course</td>
<td>3</td>
<td>Admission to the Department Honors Program, completion of MATH 420W with a grade of B or higher.</td>
<td>Fall and spring</td>
<td>Upper Division</td>
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<td>MATH 498</td>
<td>Advanced Topics in Mathematics</td>
<td>1-3</td>
<td>At least one 300- or 400-level mathematics course appropriate to the subject, faculty permission.</td>
<td>Fall and spring</td>
<td>Upper Division</td>
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<tr>
<td>MATH 499</td>
<td>Special Problems</td>
<td>1-3</td>
<td>Faculty permission.</td>
<td>Fall and spring</td>
<td>Upper Division</td>
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**Possible applications include population and competing species models, mathematical theories of war, traffic flow, river pollution, water waves and tidal dynamics, probabilistic and simulation models.**
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<tr>
<td>MATH 499H</td>
<td>Honors Thesis</td>
<td>3</td>
<td>Completion of MATH 495H with a grade of B or higher, and approval by the department Honors advisor and thesis supervisor of the proposed thesis topic.</td>
<td>Fall and spring Preparation of written thesis in mathematics under supervision of Honors thesis advisor. The thesis, based on studies begun in MATH 495H, will require original work beyond that normally required in undergraduate work. Completed written thesis must be approved by the thesis supervisor and Honors advisor. A summary of the thesis will be presented by the student in public lecture. Successful completion of MATH 495H and MATH 499H is one of the requirements for being designated as an Honors graduate in mathematics. 9 hours supervision. (005596)</td>
<td>Graded</td>
<td>Report in Progress: ABC/NC</td>
<td>You may take this course for a maximum of 6 units</td>
<td>Upper Division</td>
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<tr>
<td>MATH 610</td>
<td>Topics in Mathematics for Secondary Teachers: Analysis</td>
<td>3</td>
<td>Admission to the master's program in mathematics education or instructor permission.</td>
<td>Through an array of pedagogical strategies, secondary mathematics teachers explore analysis topics appropriate for the secondary school curriculum. These topics and strategies provide a basis for reflective analysis and deepening knowledge of analysis. 3 hours seminar. (005599)</td>
<td>Graded</td>
<td>Report in Progress: ABC/NC</td>
<td>You may take this course for a maximum of 6 units</td>
<td>Graduate Division</td>
</tr>
<tr>
<td>MATH 615</td>
<td>Statistical Methods for Graduate Research</td>
<td>3</td>
<td>MATH 105, MATH 305, MATH 315, or MATH 350 (only one is required).</td>
<td>Through an array of pedagogical strategies, secondary mathematics teachers explore analysis topics appropriate for the secondary school curriculum. These topics and strategies provide a basis for reflective analysis and deepening knowledge of analysis. 3 hours seminar. (005597)</td>
<td>Graded</td>
<td>Report in Progress: ABC/NC</td>
<td>You may take this course for a maximum of 6 units</td>
<td>Graduate Division</td>
</tr>
<tr>
<td>MATH 620</td>
<td>Topics in Mathematics for Secondary Teachers: Geometry</td>
<td>3</td>
<td>Admission to the master's program in mathematics education or instructor permission.</td>
<td>Through an array of pedagogical strategies, secondary mathematics teachers explore geometry appropriate for the secondary school curriculum. These topics and strategies provide a basis for reflective analysis and deepening knowledge of geometry. 3 hours seminar. (005602)</td>
<td>Graded</td>
<td>Report in Progress: ABC/NC</td>
<td>You may take this course for a maximum of 6 units</td>
<td>Graduate Division</td>
</tr>
<tr>
<td>MATH 630</td>
<td>Topics in Mathematics for Secondary Teachers: Foundations of Mathematics</td>
<td>3</td>
<td>Admission to the master's program in mathematics education or instructor permission.</td>
<td>Through an array of pedagogical strategies, secondary mathematics teachers explore the foundations of mathematics topics appropriate for the secondary school curriculum. These topics and strategies provide a basis for reflective analysis and deepening knowledge of the foundations of mathematics. 3 hours seminar. (005601)</td>
<td>Graded</td>
<td>Report in Progress: ABC/NC</td>
<td>You may take this course for a maximum of 6 units</td>
<td>Graduate Division</td>
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<tr>
<td>MATH 633</td>
<td>Topics in Mathematics for Secondary Teachers: Number Theory</td>
<td>3</td>
<td>Admission to the master's program in mathematics education or instructor permission.</td>
<td>Through an array of pedagogical strategies, secondary mathematics teachers explore number theory appropriate for the secondary school curriculum. These topics and strategies provide a basis for reflective analysis and deepening knowledge of number theory. 3 hours seminar. (005605)</td>
<td>Graded</td>
<td>Report in Progress: ABC/NC</td>
<td>You may take this course for a maximum of 6 units</td>
<td>Graduate Division</td>
</tr>
<tr>
<td>MATH 635</td>
<td>Topics in Mathematics for Secondary Teachers: Discrete Mathematics</td>
<td>3</td>
<td>Admission to the master's program in mathematics education or instructor permission.</td>
<td>Through an array of pedagogical strategies, secondary mathematics teachers explore discrete mathematics topics appropriate for the secondary school curriculum. These topics and strategies provide a basis for reflective analysis and deepening knowledge of discrete mathematics. 3 hours seminar. (005600)</td>
<td>Graded</td>
<td>Report in Progress: ABC/NC</td>
<td>You may take this course for a maximum of 6 units</td>
<td>Graduate Division</td>
</tr>
<tr>
<td>MATH 637</td>
<td>Topics in Mathematics for Secondary Teachers: History of Mathematics</td>
<td>3</td>
<td>Admission to the master's program in mathematics education or instructor permission.</td>
<td>Through an array of pedagogical strategies, secondary mathematics teachers explore the history of mathematics appropriate for the secondary school curriculum. These topics and strategies provide a basis for reflective analysis and deepening knowledge of the history of mathematics. 3 hours seminar. (005603)</td>
<td>Graded</td>
<td>Report in Progress: ABC/NC</td>
<td>You may take this course for a maximum of 6 units</td>
<td>Graduate Division</td>
</tr>
</tbody>
</table>
MATH 640  Topics in Mathematics for Secondary Teachers: Modern Algebra  3 Units
Prerequisite: Admission to the master's program in mathematics education or instructor permission.
Typically Offered: Inquire at department
Through an array of pedagogical strategies, secondary mathematics teachers explore modern algebra topics appropriate for the secondary school curriculum. These topics and strategies provide a basis for reflective analysis and deepening knowledge of modern algebra. 3 hours seminar.  (005598)
Grade Basis: Report in Progress: ABC/NC
Repeatability: You may take this course for a maximum of 6 units
Course Attributes: Graduate Division

MATH 650  Topics in Mathematics for Secondary Teachers: Probability and Statistics  3 Units
Prerequisite: Admission to the master's program in mathematics education or instructor permission.
Typically Offered: Inquire at department
Through an array of pedagogical strategies, secondary mathematics teachers explore probability and statistics appropriate for the secondary school curriculum. These topics and strategies provide a basis for reflective analysis and deepening knowledge of probability and statistics. 3 hours seminar.  (005606)
Grade Basis: Report in Progress: ABC/NC
Repeatability: You may take this course for a maximum of 6 units
Course Attributes: Graduate Division

MATH 660  Topics in Mathematics for Secondary Teachers: Mathematical Modeling  3 Units
Prerequisite: Admission to the master's program in mathematics education or instructor permission.
Typically Offered: Inquire at department
Through an array of pedagogical strategies, secondary mathematics teachers explore mathematical modeling appropriate for the secondary school curriculum. These topics and strategies provide a basis for the reflective analysis and deepening knowledge of mathematical modeling. 3 hours seminar.  (005604)
Grade Basis: Report in Progress: ABC/NC
Repeatability: You may take this course for a maximum of 6 units
Course Attributes: Graduate Division

MATH 697  Independent Study  1-3 Units
Typically Offered: Fall and spring
This course is a graduate-level independent study offered for 1.0-3.0 units. You must register directly with a supervising faculty member. 3 hours supervision.  (005616)
Grade Basis: Report in Progress: Graded
Repeatability: You may take this course for a maximum of 6 units
Course Attributes: Graduate Division

MATH 698  Grad Advanced Topics in Math  1-3 Units
Typically Offered: Fall and spring
This course is for special topics offered for 1.0-3.0 units. Typically the topic is offered on a one-time-only basis and may vary from term to term and be different for different sections. See the Class Schedule for the specific topic being offered. 9 hours supervision.  (005615)
Grade Basis: Graduate Graded
Repeatability: You may take this course more than once
Course Attributes: Graduate Division

MATH 699P  Master's Project  1-3 Units
Typically Offered: Fall and spring
This course is offered for 1.0-6.0 units. You must register directly with a supervising faculty member. 9 hours supervision.  (005622)
Grade Basis: Report in Progress: CR/NC
Repeatability: You may take this course for a maximum of 6 units
Course Attributes: Graduate Division

MATH 699T  Master's Study  1-3 Units
Typically Offered: Fall and spring
This course is offered for 1.0-6.0 units. You must register directly with a supervising faculty member. 9 hours supervision.  (005620)
Grade Basis: Report in Progress: CR/NC
Repeatability: You may take this course for a maximum of 6 units
Course Attributes: Graduate Division