

Mathematics

Associate in Science Degree

Program Information

The mathematics program provides students the opportunity to complete the lower-division coursework required for four-year programs in mathematics. Declared majors will be invited to an orientation with the opportunity to meet with mathematics faculty for advising. Majors will be encouraged to participate in mathematical activities such as seminars, conferences, and poster sessions.

Career Opportunities

Mathematicians work as statisticians, analysts, computer programmers, actuaries, researchers, planners and educators.

This major is designed to meet some of the lower-division requirements for a major in Mathematics.

Upon completion of this program, the student will be able to:

- explain and apply basic concepts of single variate calculus including various forms of derivatives and integrals, their interconnections, and their uses in analyzing and solving real-world problems.
- explain and apply basic concepts of multivariate calculus, linear algebra, or differential equation techniques, their interconnections, and their uses in analyzing and solving real-world problems.
- write logical proofs of basic theorems.
- use appropriate computer applications to demonstrate mathematical problem solving.

Required Program

Units

A minimum of 21 units from the following: 21

- MATH 400 Calculus I (5)
- MATH 401 Calculus II (5)
- MATH 402 Calculus III (5)
- MATH 410 Introduction to Linear Algebra (3)
- MATH 420 Differential Equations (4)
- MATH 482 Honors Introduction to Proof and Analysis (3)

A minimum of 3 units from the following:..... 3

- CISP 360 Introduction to Structured Programming (4)
- CISP 370 Beginning Visual Basic (4)
- CISP 400 Object Oriented Programming with C++ (4)
- CISP 401 Object Oriented Programming with Java (4)
- ENGR 405 Engineering Problem Solving (3)
- STAT 480 Introduction to Probability and Statistics - Honors (4)
or STAT 300 Introduction to Probability and Statistics (4)

Total Units Required

24

Note: Students planning to transfer to four-year institutions are advised to meet with a counselor for general education requirements.

Associate in Science (A.S.) Degree

The Associate in Science degree may be obtained by completion of all courses in the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See SCC graduation requirements.

Note: The University of California has a credit restriction on certain combinations of mathematics courses. See counselor for detailed information on the current UC Articulation Agreement.

Mathematics (MATH)

MATH 27 Self-Paced Basic Skills Mathematics .5-2 Units

Prerequisite: None

Hours: 24 hours LEC; 108 hours LAB

This is a self-paced course in basic mathematics skills including the basic operations of addition, subtraction, multiplication, and division applied to the whole numbers, fractions, and decimals. This course is graded Pass/No Pass. Credit is earned in one-half unit increments, and is dependent on progress in the course and class participation. This is an open-entry/open-exit course with admission as late as the 12th week, and may be taken up to four times for a maximum of two units. This course does not fulfill the learning skills requirement for graduation.

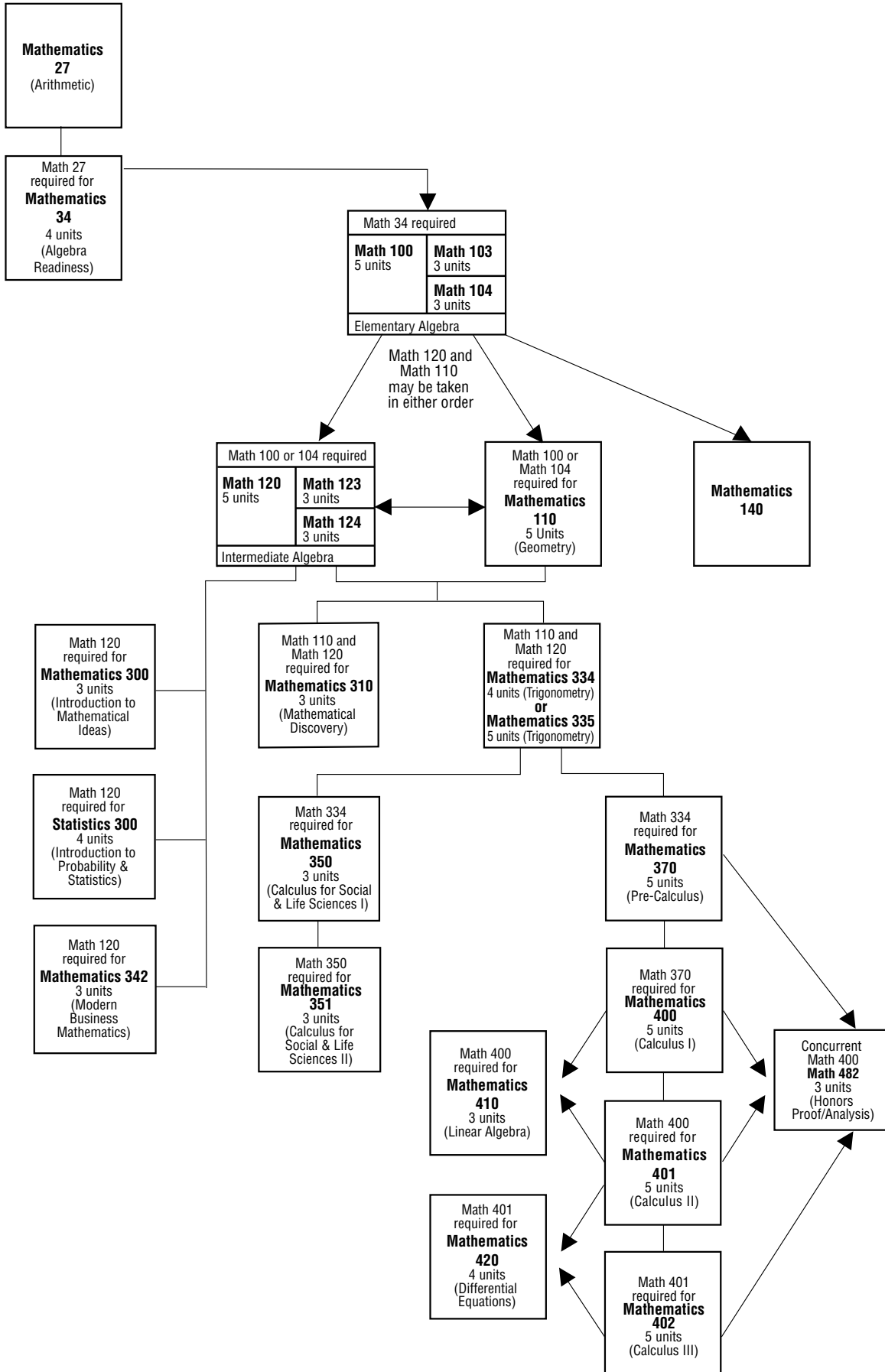
MATH 34 Pre-algebra 4 Units

Prerequisite: MATH 27 with a "P" or by placement through the assessment process. A grade of "P" is completion of the MATH 27 curriculum, regardless of the number of units earned.

Hours: 72 hours LEC

The emphasis in this course will be on skills necessary for success in elementary algebra. Course content will include review of fundamentals of arithmetic including whole numbers, common fractions, decimal fractions, and percentages. Other topics include order of operations, signed numbers, complex fractions, exponents, and scientific notation. There will be an introduction to the algebra of polynomials and/or an introduction to graphing lines, as time permits.

Math Sequence



MATH 80 Mathematics Study Skills 1 Unit

Prerequisite: MATH 27 with a "P" (Pass) or by placement through the assessment process. A grade of "P" is completion of the Math 27 curriculum, regardless of the number of units earned. A list consisting of current students with a "P" grade in Math 27 will be issued from the Mathematics, Statistics, and Engineering Division to the instructor prior to the first day of instruction.

Advisory: ENGRD 110 with a grade of "C" or better

Hours: 18 hours LEC

This course will help students increase their motivation and confidence and maximize their abilities in any mathematics course. Students will consider their current levels of math and test anxieties and make progress in lowering them to a productive level. Students will gain strategies to overcome barriers to mathematical success. Specific concepts will be designed for the current level of each student. Students may take this course along with another Mathematics or Statistics course or may wish to take the course as preparation before enrolling in a Mathematics or Statistics course. This course is graded as Pass/No Pass.

MATH 100 Elementary Algebra 5 Units

Prerequisite: MATH 34 with a grade of "C" or better; or placement through the assessment process.

General Education: AA/AS Area II(b)

Hours: 90 hours LEC

This course includes the fundamental concepts and operations of algebra with problem solving skills emphasized throughout. Topics include: properties of real numbers, linear equations and inequalities, integer exponents, polynomials, polynomial factorization, rational expressions and equations, radical expressions and equations, rational exponents, systems of linear equations and inequalities, the rectangular coordinate system, graphs and equations of lines, and quadratic equations.

MATH 103 Elementary Algebra, Part I 3 Units

Prerequisite: MATH 34 with a grade of "C" or better; or placement through the assessment process.

Hours: 54 hours LEC

This course will cover the first half of the traditional MATH 100 course. Topics include: properties of real numbers, linear equations and inequalities, integer exponents, polynomials, systems of linear equations and inequalities, the rectangular coordinate system, graphs and equations of lines, and applications.

MATH 104 Elementary Algebra, Part II 3 Units

Prerequisite: MATH 103 with a grade of "C" or better

General Education: AA/AS Area II(b)

Hours: 54 hours LEC

This course covers the second half of the traditional MATH 100 course. Topics include: polynomial factorization, rational expressions and equations, radical expressions and equations, rational exponents, quadratic equations, and applications.

MATH 110 Elementary Geometry 5 Units

Prerequisite: MATH 100 or 104 with a grade of "C" or better; or placement through the assessment process.

General Education: AA/AS Area II(b)

AA/AS: Mathematics Competency

Hours: 90 hours LEC

This course introduces Euclidean Geometry. Topics include sets, definitions, postulates, theorems, deductive and inductive reasoning, proof, parallel lines, triangles, polygons, congruence, similarity, constructions, the Pythagorean Theorem, right triangle trigonometry, circles, analytic geometry, and elementary solid geometry.

MATH 120 Intermediate Algebra 5 Units

Prerequisite: MATH 100 or 104 with a grade of "C" or better; or placement through the assessment process.

General Education: AA/AS Area II(b)

AA/AS: Mathematics Competency

Hours: 90 hours LEC

This course reviews and extends the concepts of elementary algebra, with problem solving skills emphasized throughout. Topics that are reviewed and extended include: linear and quadratic equations, factoring polynomials, rational expressions, exponents, radicals, equations of lines, and systems of equations. New topics include graphs and their translations and reflections, functions, exponential and logarithmic functions, graphs of quadratic and polynomial functions, nonlinear systems of equations, polynomial, rational and absolute value inequalities, sequences, series and The Binomial Theorem.

MATH 123 Intermediate Algebra, Part I 3 Units

Prerequisite: MATH 100 or 104 with a grade of "C" or better; or placement through the assessment process.

General Education: AA/AS Area II(b)

Hours: 54 hours LEC

This course reviews and extends the concepts of elementary algebra with problem solving skills emphasized throughout. Topics include solving linear equations and inequalities, factoring of polynomials, rational expressions, exponents, radicals, solving equations containing rational and radical expressions, equations of lines, functions and absolute value equations and inequalities, and complex numbers.

MATH 124 Intermediate Algebra, Part II 3 Units

Prerequisite: MATH 123 with a grade of "C" or better

General Education: AA/AS Area II(b)

AA/AS: Mathematics Competency

Hours: 54 hours LEC

This course reviews and extends the concepts of elementary algebra and MATH 123 with problem solving skills emphasized throughout. Topics include quadratic expressions, equations, inequalities and graphs, systems of equations, composite and inverse functions, exponential and logarithmic functions, and sequences and series.

MATH 140 Mathematical Literacy 4 Units

Prerequisite: MATH 100 or 104 with a grade of "C" or better; or placement through the assessment process.

General Education: AA/AS Area II(b);

AA/AS: Mathematics Competency

Hours: 72 hours LEC

This course introduces students to every day uses of mathematics. Mathematical literacy is necessary to fully participate in the democratic decision-making process. Topics will include measurement systems, reasoning and logic, elections, inflation and other indexes, chance and risk, and finances, and may include other topics, such as environmental or health issues.

MATH 170 Algebra Review for Calculus 2 Units

Prerequisite: None

General Education: AA/AS Area II(b)

Hours: 36 hours LEC

This course is a review of the algebraic skills necessary for successes in Calculus. Topics include real numbers, linear equations and inequalities, properties of lines, polynomials and factoring, rational expressions, exponents, quadratic equations, and functions. Course is graded as Pass/No Pass.

MATH 295 Independent Studies in Mathematics 1-3 Units

Prerequisite: None

Hours: 54 hours LEC

This is an independent studies course. The topics are to be arranged between the instructor and the student.

MATH 299 Experimental Offering in Mathematics .5-4 Units

Prerequisite: None

Hours: 108 hours LEC

See Experimental Offering.

MATH 300 Introduction to Mathematical Ideas 3 Units

Prerequisite: MATH 120 or 124 with a grade of "C" or better; or placement through the assessment process.

General Education: AA/AS Area II(b); CSU Area B4; IGETC Area 2;

AA/AS: Mathematics Competency

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course is intended to help the non-Mathematics major student relate to the spirit of mathematics through a study of some fundamental ideas of mathematics. Several specific topics will be covered, to be chosen from: numeration systems, logic, sets, number theory, algebraic modeling, geometry, combinatorics, probability, statistics, consumer mathematics, graph theory, voting and apportionment, matrices, and perhaps others. This course is not recommended for students entering elementary school teaching or for business administration majors.

MATH 310 Mathematical Discovery 3 Units

Prerequisite: MATH 120 or MATH 124 with a grade of "C" or better or placement through the assessment process; AND MATH 110 or two semesters of high school Geometry with grades of "C" or better.

General Education: AA/AS Area II(b)

AA/AS: Mathematics Competency

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course is designed to introduce students to the spirit of mathematics by involving them in aspects of mathematical processes of exploration, conjecture, and proof. Students will examine mathematical patterns and relations, formulate conjectures, and prove their conjectures. Areas of mathematics from which content may be derived include number theory, statistics, probability, geometry, and sequences and series. This course is recommended for students interested in a career in education.

MATH 315 Exploratory Field Experience in Mathematics 3 Units

Prerequisite: MATH 120 with a grade of "C" or better

Enrollment Limitation: Current TB clearance is required prior to work in schools. Fingerprinting may also be required.

Course Transferable to UC/CSU

Hours: 36 hours LEC; 54 hours LAB

This course is an education-based field experience in mathematics allowing students to explore teaching as a career choice. Students are assigned to area schools to observe and/or assist in mathematics classrooms. Students have the opportunity to learn and practice essential skills to assist middle or high school students with their progress through the mathematics sequence and to learn about social, cultural, and educational issues related to mathematics and the school environment. Weekly seminars allow students to share experiences and compare observations. This course is recommended for those who may wish to pursue a single-subject credential in mathematics.

MATH 334 Trigonometry 4 Units

Prerequisite: MATH 120 or MATH 124 with a grade of "C" or better or placement through the assessment process; AND MATH 110 or a college Geometry course or two semesters of high school Geometry with grades of "C" or better.

General Education: AA/AS Area II(b); CSU Area B4

AA/AS: Mathematics Competency

Course Transferable to CSU

Hours: 72 hours LEC

This course focuses on the fundamental concepts of trigonometry and its applications. Topics include: functions of angles, circular functions, radian measure, polar coordinates, trigonometric identities and equations, graphing, inverse trigonometric functions, solutions of triangles, and vectors. Other topics may be included at the discretion of the instructor.

MATH 335 Trigonometry with College Algebra 5 Units

Prerequisite: MATH 120 or MATH 124 with a grade of "C" or placement through the assessment process; AND MATH 110 or a college Geometry course or two semesters of high school Geometry with a grade of "C" or better.

*General Education: CSU Area B4
AA/AS: Mathematics Competency
Course Transferable to CSU
Hours: 90 hours LEC*

This is a full trigonometry course with algebra concepts reviewed, extended, and integrated when they are relevant to the trigonometric concepts. The trigonometric topics include right triangle trigonometry, unit circle trigonometry, graphs of trigonometric functions, proofs of trigonometric identities, solving trigonometric equations, applications of trigonometric functions (laws of sines and cosines), inverse trigonometric functions, and vectors. The algebra topics include graphs of polynomial and rational functions, conic sections, the polar coordinate system, and solving equations, inequalities, and systems of equations and inequalities (including using matrices to solve systems of equations).

MATH 342 Modern Business Mathematics 3 Units

Prerequisite: MATH 120 or 124 with a grade of "C" or better; or placement through the assessment process.

*General Education: AA/AS Area II(b); CSU Area B4
AA/AS: Mathematics Competency
Course Transferable to CSU
Hours: 54 hours LEC*

This is a course designed around applications of mathematics in economic and business contexts. Specific topics will include functions and related business formulas, tables and graphs, finance (interest, annuities, and exponential models in economics), rates of change including applications and optimization, and linear programming.

MATH 350 Calculus for the Life and Social Sciences I 3 Units

Prerequisite: MATH 334 or 335 with a grade of "C" or better; or placement through the assessment process.

*General Education: AA/AS Area II(b); CSU Area B4; IGETC Area 2
AA/AS: Mathematics Competency
Course Transferable to UC/CSU
Hours: 54 hours LEC*

This course is an introduction to calculus. Topics include functions, trigonometric functions, limits, analytic geometry, and differential calculus with applications to biological and social sciences. This course is intended for students majoring in the biological and social sciences and some business majors.

MATH 351 Calculus for the Life and Social Sciences II 3 Units

*Prerequisite: MATH 350 with a grade of "C" or better
General Education: AA/AS Area II(b); CSU Area B4; IGETC Area 2
AA/AS: Mathematics Competency
Course Transferable to UC/CSU
Hours: 54 hours LEC*

This course is a continuation of MATH 350. Topics include: definite and indefinite integrals, power series, analytic geometry, multivariate calculus, and differential equations, with applications to life and social sciences.

MATH 370 Pre-Calculus Mathematics 5 Units

Prerequisite: MATH 334 with a grade of "C" or better; or placement through the assessment process.

*General Education: AA/AS Area II(b); CSU Area B4; IGETC Area 2
AA/AS: Mathematics Competency
Course Transferable to UC/CSU
Hours: 90 hours LEC*

This course is designed to prepare students for MATH 400, 401, and 402. Course content includes a brief review followed by an in-depth extension of the properties of polynomial, rational, exponential, logarithmic, and trigonometric functions. Additional topics include systems of linear and non-linear equations and inequalities, conic sections, sequences and series, analytic geometry, vectors, polar and parametric equations. Graphing calculators may be required for this course.

MATH 400 Calculus I 5 Units

Prerequisite: MATH 370 with a grade of "C" or better; or placement through the assessment process

*General Education: AA/AS Area II(b); IGETC Area 2
AA/AS: Mathematics Competency
Course Transferable to UC/CSU
Hours: 90 hours LEC*

This course explores the basic concepts of analytic geometry, limits, including indeterminate forms, derivatives and integrals. The topics covered will include graphs, derivatives, and integrals of algebraic, trigonometric, exponential, logarithmic and hyperbolic functions. Standard proofs will be covered, such as delta/epsilon proofs and proofs of some theorems. Applications will be covered, including those involving rectilinear motion, differentials, related rates, graphing, and optimization.

MATH 401 Calculus II 5 Units

Prerequisite: MATH 400 with a grade of "C" or better

*General Education: AA/AS Area II(b); CSU Area B4; IGETC Area 2
AA/AS: Mathematics Competency
Course Transferable to UC/CSU
Hours: 90 hours LEC*

This course is a continuation of MATH 400. Topics covered will include techniques of integration, numerical integration, improper integrals, infinite series, parametric equations, polar coordinates, and possibly conic sections. Many applications will be covered including those involving areas between plane regions, volumes of revolution, work, moments and centers of mass, average value, arc length, and surface area.

MATH 402 Calculus III 5 Units

Prerequisite: MATH 401 with a grade of "C" or better

*General Education: AA/AS Area II(b); CSU Area B4; IGETC Area 2
AA/AS: Mathematics Competency
Course Transferable to UC/CSU
Hours: 90 hours LEC*

This course extends the concepts of limits, derivatives, and integrals to vector-valued functions and functions of more than one variable. The topics covered will include three-dimensional analytic geometry and vectors, partial derivatives, multiple integrals, line integrals, surface integrals, and the theorems of Green, Gauss (Divergence), and Stokes. Many applications of calculus will be included.

MATH 410 Introduction to Linear Algebra 3 Units

Prerequisite: MATH 400 with a grade of "C" or better

General Education: AA/AS Area II(b); IGETC Area 2

AA/AS: Mathematics Competency

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course introduces linear algebra. Topics include matrices, determinants, systems of equations, vector spaces, linear transformations, eigenvectors, and applications. Proofs of elementary theorems of basic linear algebra will be covered. The course is intended for majors in mathematics, engineering, science, and related fields.

MATH 420 Differential Equations 4 Units

Prerequisite: MATH 401 with a grade of "C" or better

General Education: AA/AS Area II(b); IGETC Area 2

AA/AS: Mathematics Competency

Course Transferable to UC/CSU

Hours: 72 hours LEC

This course will cover the theory and applications of the solutions of ordinary differential equations and systems of ordinary differential equations. Students will be introduced to various topics useful in the solution of these differential equations including power series, Laplace transforms, matrices, eigenvalues and eigenvectors, and numerical methods.

MATH 482 Honors Introduction to Proof and Analysis 3 Units

Prerequisite: MATH 400 with a grade of "C" or better or concurrent enrollment in MATH 400

General Education: AA/AS Area II(b); IGETC Area 2

AA/AS: Mathematics Competency

Enrollment Limitation: Eligibility for the honors program

Course Transferable to UC/CSU

Hours: 54 hours LEC

This seminar course is intended to give the student an introduction to the theoretical foundations of calculus. Methods of proof will be discussed, especially as they relate to the theorems and techniques of calculus. This honors course uses an emphasis on mathematical proofs to challenge motivated students.

MATH 494 Topics in Mathematics .5-4 Units

Prerequisite: None

Course Transferable to UC/CSU

Hours: 72 hours LEC

This course provides the ability to take a course in mathematics that covers topics that are not part of the regular curriculum. This course may be taken up to four times for credit, for a maximum of 16 units, provided each course offering covers a different set of topics.

MATH 495 Independent Studies in Mathematics 1-3 Units

Prerequisite: None

Course Transferable to UC/CSU

Hours: 54 hours LEC

This is an independent studies course. The topics are to be arranged between the instructor and the student.

MATH 499 Experimental Offering in Mathematics .5-4 Units

Prerequisite: None

Course Transferable to UC/CSU

Hours: 54 hours LEC

See Experimental Offerings