MATHEMATICS

https://math.calpoly.edu (https://math.calpoly.edu/)

The Mathematics Department offers a comprehensive undergraduate program of courses leading to a Bachelor of Science degree in mathematics. It also offers a program of courses for students who wish to minor in mathematics, as well as graduate courses for programs of study leading to a Master of Science degree. The mix of pure and applied mathematics in these courses increases both the usefulness of and the demand for graduates with a degree in mathematics. In addition, the Mathematics Department offers courses that serve all departments in the university.

The rich variety of courses in the Mathematics Department provides students with the opportunity to experience those fields and the techniques of mathematics that are most useful in the physical sciences, engineering, statistics and business. Examples include mathematical modeling, mathematical biology, data science, operations research, fluid dynamics, numerical analysis, financial mathematics and sustainability.

For mathematics placement (MAPE) information visit the Academic Standards and Policies (https://catalog.calpoly.edu/academicstandardsandpolicies/academicplacement/) section.

Undergraduate Programs

- Mathematics (BS) (https://catalog.calpoly.edu/science-mathematics/mathematics/mathematics-bs/)

Undergraduate Minors

- Mathematics Minor (https://catalog.calpoly.edu/science-mathematics/mathematics/mathematics-minor/)

Graduate Programs

- Mathematics (MS) (https://catalog.calpoly.edu/science-mathematics/mathematics/mathematics-ms/)

ESM Courses

ESM 900 Early Start Program: Mathematics Workshop (1 unit)
Term Typically Offered: SU
CR/NC
Prerequisite: Appropriate Math Placement. Concurrent: ESM 1005.

Review of basic algebra intended to prepare students for precalculus. Not for baccalaureate credit. Credit/No Credit grading only. Course offered online only. 1 lecture. Formerly ESM 90.

ESM 1005 Early Start Program: Mathematics (1 unit)
Term Typically Offered: SU
CR/NC
Prerequisite: Appropriate Math Placement. Concurrent: ESM 900.

Review of basic algebra. Intended for students who plan to take the Mathematics Placement Exam for Precalculus Readiness. 1 unit for baccalaureate credit. Credit/No Credit grading only. Course offered online only. 1 lecture. Formerly ESM 105.

ESM 1200 Early Start Mathematics: Precalculus Review (1 unit)
Term Typically Offered: SU
CR/NC
Prerequisite: Appropriate Math Placement.

Review of basic algebra and trigonometry. Intended for STEM majors who plan to take the Mathematics Placement Exam for Calculus Readiness. 1 unit for baccalaureate credit. Credit/No Credit grading only. Course offered online only. 1 lecture. Formerly ESM 120.

MATH Courses

MATH 900 Intermediate Algebra (2 units)
Term Typically Offered: F, SP
CR/NC
Prerequisite: Appropriate Math Placement. Concurrent: MATH 1000.

Review of basic algebra skills intended primarily to prepare students for the precalculus content in MATH 1000. Not for baccalaureate credit. Credit/No Credit grading only. 2 lectures. Formerly MATH 96.

MATH 1000 Transition to College Algebra (1 unit)
Term Typically Offered: F, SP
CR/NC
Prerequisite: Appropriate Math Placement. Concurrent: MATH 900.

A first course in college algebra with built-in review of basic algebra skills. Real and complex numbers, exponents and radicals. Polynomial operations and factoring. Modeling with equations and inequalities. Linear and quadratic functions and their graphs. Credit/No Credit grading only. 1 lecture.

MATH 1001 Nature of Modern Mathematics (3 units)
Term Typically Offered: SP
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: Appropriate Math Placement or MATH 1000.

Concepts from contemporary mathematics, their development, applications, and role in society. Graph theory, critical path analysis, statistical inference, coding, game theory, and symmetry. 3 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). Formerly MATH 112.

MATH 1004 Stretch College Algebra (5 units)
Term Typically Offered: F, SP
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: Appropriate Math Placement or MATH 1000.

Precalculus algebra without trigonometry. Factoring, exponents, and radicals. Real and complex numbers. Modeling with equations and inequalities. Rational, exponential, and logarithmic functions. Matrices, determinants, and systems of linear equations. MATH 1004 covers the same material as MATH 1006, but meets 5 hours a week. Not open to students with credit in MATH 117, MATH 118, MATH 119, MATH 141, MATH 161, MATH 221, MATH 1005, MATH 1006, MATH 1007, MATH 1261, MATH 1264, or MATH 1267. 5 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). MATH 1004 is equivalent to MATH 116 and MATH 117, students may not earn credit for MATH 1004 if they have earned credit for MATH 116 and MATH 117.

MATH 1005 Stretch Precalculus (5 units)
Term Typically Offered: F, SP
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: Appropriate Math Placement or MATH 1000.

Precalculus with trigonometry. Factoring, exponents, and radicals. Rational, exponential, logarithmic, and trigonometric functions. Trigonometric identities. Inverse trigonometric functions and relations. MATH 1005 covers the same material as MATH 1007, but meets 5 hours a week. Not open to students with credit in MATH 117, MATH 118, MATH 119, MATH 141, MATH 161, MATH 221, MATH 1007, MATH 1261, MATH 1264, or MATH 1267. 5 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs).

MATH 1006 College Algebra (3 units)
Term Typically Offered: F, SP, SU
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: Appropriate Math Placement.

Precalculus algebra without trigonometry. Factoring, exponents, and radicals. Real and complex numbers. Modeling with equations and inequalities. Rational, exponential, and logarithmic functions. Matrices, determinants, and systems of linear equations. MATH 1006 covers the same material as MATH 1004, but meets 3 hours a week. Not open to students with credit in MATH 117, MATH 118, MATH 119, MATH 141, MATH 161, MATH 221, MATH 1004, MATH 1005, MATH 1007, MATH 1261, MATH 1264, or MATH 1267. 3 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). Formerly MATH 118.

MATH 1007 Precalculus (3 units)
Term Typically Offered: F, SP, SU
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: Appropriate Math Placement.

Precalculus with trigonometry. Factoring, exponents, and radicals. Rational, exponential, logarithmic, and trigonometric functions. Trigonometric identities. Inverse trigonometric functions and relations. MATH 1007 covers the same material as MATH 1005, but meets 3 hours a week. Not open to students with credit in MATH 117, MATH 118, MATH 119, MATH 141, MATH 161, MATH 221, MATH 1005, MATH 1261, MATH 1264, or MATH 1267. 3 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs).

MATH 1016 College Algebra Workshop (1 unit)
Term Typically Offered: TBD
CR/NC
Corequisite: Enrollment in the associated section of MATH 1006.

Facilitated study and discussion of the theory, problems, and applications of college algebra. Credit/No Credit grading only. 1 laboratory. Formerly MATH 128.

MATH 1017 Precalculus Workshop (1 unit)
Term Typically Offered: TBD
CR/NC
Corequisite: Enrollment in the associated section of MATH 1007.

Facilitated study and discussion of the theory, problems, and applications of precalculus. Credit/No Credit grading only. 1 laboratory. Formerly MATH 129.

MATH 1151 Linear Algebra (3 units)
Term Typically Offered: F, SP, SU
Prerequisite: One of the following: MATH 141, MATH 1261, or DATA/MATH 1264.

Systems of linear equations, linear transformations, vector spaces and subspaces, determinants, eigenvalues, eigenvectors, and diagonalization. Orthogonality, Markov chains and discrete dynamical systems, symmetric matrices and quadratic forms. 3 lectures. Formerly MATH 206.

MATH 1161 Linear Algebra Workshop (1 unit)
Term Typically Offered: TBD
CR/NC
Corequisite: Enrollment in the associated section of MATH 1151.

Facilitated study and discussion of the theory, problems, and applications of linear algebra. Credit/No Credit grading only. 1 laboratory.

MATH 1253 Calculus II A (2 units)
Prerequisite: MATH 1261.

Techniques of integration. Introduction to sequences and series. Parametric curves and polar coordinates. Applications in physics. 2 lectures.

MATH 1261 Calculus I (4 units)
Term Typically Offered: F, SP, SU
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: Appropriate Math Placement, MATH 1005 with a grade of C- or better, or MATH 1007 with a grade of C- or better.

Limits, continuity, and differentiation of rational, exponential, logarithmic, trigonometric, and inverse trigonometric functions. Optimization and related rates. Introduction to integration. Differential Equations. Applications in physics. Not open to students with credit in MATH 1264. 4 lectures. Crosslisted as HNRS/MATH 1261. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). Formerly offered as part of the MATH 141, 142, 143 series, students may not earn credit for both MATH 141 and MATH 1261.

MATH 1262 Calculus II (4 units)
Term Typically Offered: F, SP, SU
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: MATH 141B with a grade of C- or better, MATH 142 with a grade of C- or better, or MATH 1261 with a grade of C- or better, or consent of instructor.

Techniques of integration. Sequences and series. Parametric curves and polar coordinates. Vectors and vector functions. Applications in physics. Not open to students with credit in MATH 1263 or MATH 1265. 4 lectures. Crosslisted as HNRS/MATH 1262. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). Formerly offered as part of the MATH 141, 142, 143 series, students may not earn credit for both MATH 143 and MATH 1262.

MATH 1263 Bridge Calculus II (2 units)
Term Typically Offered: F
Prerequisite: Appropriate Math Placement.

Sequences and series, Taylor polynomials. Vectors, the dot product, the cross product, equations of lines and planes. Intended for students with a 4 or a 5 on the AP Calculus BC exam. Not open to students with credit in MATH 143, MATH 1262, or MATH 1265. An appropriate AP Calculus BC score and MATH 1263 is equivalent to MATH 1261 and MATH 1262. Half-semester course. 2 lectures. Crosslisted as HNRS/MATH 1263.

MATH 1264 Calculus for Data Science I (4 units)
Term Typically Offered: F, SP
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: Appropriate Math Placement, MATH 1005 with a grade of C- or better, or MATH 1007 with a grade of C- or better.

Limits, continuity, and differentiation of rational, exponential, logarithmic, trigonometric, and inverse trigonometric functions. Optimization. Techniques of integration. Differential equations. Parametric equations and polar coordinates. 4 lectures. Crosslisted as DATA/MATH 1264. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs).

MATH 1265 Calculus for Data Science II (4 units)
Term Typically Offered: F, SP, SU
Prerequisite: DATA/MATH 1264 with a grade of C- or better.

Vectors and vector functions. Partial derivatives. Multiple integrals. Lagrange Multipliers. Sequences and series. 4 lectures. Crosslisted as DATA/MATH 1265.

MATH 1267 Business Calculus (3 units)
Term Typically Offered: F, SP
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: One of the following: Appropriate Math Placement, MATH 117, MATH 118, MATH 119, MATH 1004, MATH 1005, MATH 1006, or MATH 1007.

Limits, continuity, and differentiation of rational, exponential, and logarithmic functions. Optimization and related rates. Introduction to integration. Partial differentiation and optimization of functions of several variables. Applications in business and economics. Not open to students with credit in MATH 141, MATH 1261, or MATH 1264. 3 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). Formerly MATH 221.

MATH 1271 Calculus I Workshop (1 unit)
Term Typically Offered: TBD
CR/NC
Corequisite: Enrollment in the associated section of MATH 1261.

Facilitated study and discussion of the theory, problems, and applications of calculus. Credit/No Credit grading only. 1 laboratory. Formerly MATH 151.

MATH 1272 Calculus II Workshop (1 unit)
Term Typically Offered: TBD
CR/NC
Corequisite: Enrollment in the associated section of MATH 1262.

Facilitated study and discussion of the theory, problems, and applications of calculus. Credit/No Credit grading only. 1 laboratory. Formerly MATH 152.

MATH 1274 Calculus for Data Science I Workshop (1 unit)
Term Typically Offered: TBD
CR/NC
Corequisite: Enrollment in the associated section of DATA/MATH 1264.

Facilitated study and discussion of the theory, problems, and applications of calculus for data science. Credit/No Credit grading only. 1 laboratory.

MATH 1275 Calculus for Data Science II Workshop (1 unit)
Term Typically Offered: TBD
CR/NC
Corequisite: Enrollment in the associated section of DATA/MATH 1265.

Facilitated study and discussion of the theory, problems, and applications of calculus for data science. Credit/No Credit grading only. 1 laboratory.

MATH 1277 Business Calculus Workshop (1 unit)
Term Typically Offered: TBD
CR/NC
Corequisite: Enrollment in the associated section of MATH 1267.

Facilitated study and discussion of the theory, problems, and applications of business calculus. Credit/No Credit grading only. 1 laboratory. Formerly MATH 231.

MATH 2001 Mathematics Orientation (1 unit)
Term Typically Offered: F, SP
CR/NC
Prerequisite: MATH 143, MATH 1262, or MATH 1263.

Overview of the mathematics major. Career opportunities, a survey of departmental facilities and curriculum, opportunities in research. Introduction to mathematical software. Credit/No Credit grading only. 1 lecture. Formerly MATH 202.

MATH 2031 Transition to Advanced Mathematics (3 units)
Term Typically Offered: F, SP, SU
Prerequisite: One of the following: MATH 143, MATH 1262, MATH 1263, or DATA/MATH 1265.

Set theory, logic, quantified statements, indexed sets. Methods of proof: direct, contrapositive, contradiction, mathematical induction. Equivalence relations and partitions. Functions, cardinality, countable, and uncountable sets. Proofs in number theory, algebra, geometry, or analysis. 3 lectures. Formerly MATH 248.

MATH 2041 Transition to Advanced Mathematics Workshop (1 unit)
Term Typically Offered: TBD
CR/NC
Corequisite: Enrollment in the associated section of MATH 2031.

Facilitated study and discussion of the methods and techniques of proof in mathematics. Credit/No Credit grading only. 1 laboratory. Formerly MATH 258.

MATH 2263 Calculus III (3 units)
Term Typically Offered: F, SP, SU
Prerequisite: MATH 143, MATH 1262, or MATH 1263.

Partial derivatives. Multiple integrals. Lagrange Multipliers. Line and surface integrals of vector fields. Green's Theorem and the Divergence Theorem. 3 lectures. Crosslisted as HNRS/MATH 2263. Formerly HNRS/MATH 241.

MATH 2270 Special Topics (1-3 units)
Term Typically Offered: TBD
Prerequisite: Consent of instructor.

Directed group study of special topics. The Class Schedule will list topic selected. Repeatable up to 6 units. 1 to 3 lectures. Formerly MATH 270.

MATH 2273 Calculus III Workshop (1 unit)
Term Typically Offered: TBD
CR/NC
Corequisite: Enrollment in the associated section of MATH 2263.

Facilitated study and discussion of the theory, problems, and applications of calculus. Credit/No Credit grading only. 1 laboratory. Formerly MATH 251.

MATH 2341 Linear Analysis (4 units)
Term Typically Offered: F, SP, SU
Prerequisite: One of the following: MATH 143, MATH 1262, MATH 1263, or DATA/MATH 1265.

Linear algebra, systems of linear equations, linear transformations, determinants, eigenvalues, eigenvectors, and diagonalization. Differential equations: first-order differential equations, higher order linear differential equations, mechanical and electrical vibrations, systems of differential equations, the Laplace transform. 4 lectures. Crosslisted as HNRS/MATH 2341. Formerly HNRS/MATH 244.

MATH 2343 Differential Equations (3 units)
Term Typically Offered: F, SP
Prerequisite: MATH 206 or MATH 1151; and one of the following: MATH 143, MATH 1262, MATH 1263, or DATA/MATH 1265.

First-order differential equations. Second-order and higher-order linear differential equations. Mathematical models, systems of differential equations, Laplace transforms, series solutions, matrix methods for linear systems. 3 lectures. Formerly MATH 242.

MATH 2351 Linear Analysis Workshop (1 unit)
Term Typically Offered: TBD
CR/NC
Corequisite: Enrollment in the associated section of MATH 2341.

Facilitated study and discussion of the theory, problems, and applications of linear analysis. Credit/No Credit grading only. 1 laboratory. Formerly MATH 254.

MATH 2621 Introduction to Mathematical Optimization (3 units)
Term Typically Offered: F, SP
Prerequisite: One of the following: MATH 241, DATA/MATH 1265, or MATH 2263; and one of the following: MATH 206, MATH 244, MATH 1151, or MATH 2341.

Algorithms and mathematical analysis for solving optimization problems. One-dimensional search methods; Newton's method extended to multi-dimensional optimization problems and gradient methods. The basic mathematics of neural networks and examples of their application. Optimization problems with equality and inequality constraints. 3 lectures. Crosslisted as DATA/MATH 2621. Formerly MATH 253.

MATH 3011 History of Mathematics (3 units)
Term Typically Offered: SP
Prerequisite: MATH 248 or MATH 2031 with a grade of C - or better, or consent of instructor; and one upper-division MATH course.

Evolution of mathematics from earliest to modern times. Major trends in mathematical thought, the interplay of mathematical and technological innovations, and the contributions of great mathematicians. Appropriate for prospective and in-service teachers. 3 lectures. Formerly MATH 419.

MATH 3051 Combinatorics I (3 units)
Term Typically Offered: F
2026-28 or later: Upper-Div GE Area 2/5
2020-26 catalogs: Upper-Div GE Area B
Prerequisite: Junior standing or Mathematics major; completion of GE Area 1 with grades of C- or better (GE Area A for the 2020-26 catalogs); and completion of GE Area 2 with a grade of C- or better (GE Area B4 for the 2020-26 catalogs); and one of the following: MATH 206, MATH 248, MATH 1151, or MATH 2031.

Methods of enumerative combinatorics: sum, product, and division rules, mathematical induction, bijective and recursive techniques, inclusion and exclusion, and generating functions. The theory of partitions, the calculus of finite differences, elementary graph theory, designs, and codes. 3 lectures. Fulfills GE Area Upper-Division 2 or Upper-Division 5 (GE Area Upper-Division B for students on the 2020-26 catalogs). Formerly MATH 334.

MATH 3055 Graph Theory (3 units)
Term Typically Offered: F
Prerequisite: Junior standing, MATH 248, or MATH 2031.

Introduction to graph theory and its applications: isomorphism, paths and searching, connectedness, trees, planarity, graph colorings, matching theory, network flow, graph matrices. Further areas may include the theory of finite state machines, Ramsey theory, spectral theory and extremal theory. 3 lectures. Formerly MATH 335.

MATH 3111 Number Theory (3 units)
Term Typically Offered: SP
2026-28 or later: Upper-Div GE Area 2/5
2020-26 catalogs: Upper-Div GE Area B
Prerequisite: Junior standing or Mathematics major; completion of GE Area 1 with grades of C- or better (GE Area A for the 2020-26 catalogs); and completion of GE Area 2 with a grade of C- or better (GE Area B4 for the 2020-26 catalogs); and MATH 248 or MATH 2031.

The Euclidean algorithm and greatest common divisors. Diophantine equations. Properties of prime numbers. The theory of congruences. Multiplicative functions and Mobius Inversion. Gauss' Law of Quadratic Reciprocity. Historical and modern applications of number theory. 3 lectures. Fulfills GE Areas Upper-Division 2 or Upper-Division 5 (GE Area Upper-Division B for students on the 2020-26 catalogs).

MATH 3152 Advanced Linear Algebra (4 units)
Term Typically Offered: F, SP
Prerequisite: One of the following: MATH 206, MATH 244, MATH 1151, or MATH 2341; and MATH 248 or MATH 2031 with a grade of C- or better.

Rigorous development of real and complex vector spaces. May include subspaces, bases, direct sums, linear maps, eigenvalues, eigenvectors, diagonalization, inner product spaces, self-adjoint and normal operators, spectral theorems, nilpotent operators, characteristic and minimal polynomials, Cayley-Hamilton Theorem. 4 lectures. Formerly MATH 306.

MATH 3162 Advanced Linear Algebra Workshop (1 unit)
Term Typically Offered: TBD
CR/NC
Corequisite: Enrollment in the associated section of MATH 3152.

Facilitated study and discussion of the methods and techniques of proof in linear algebra. Credit/No Credit grading only. 1 laboratory. Formerly MATH 316.

MATH 3301 Complex Analysis (3 units)
Term Typically Offered: SP
2026-28 or later: Upper-Div GE Area 2/5
2020-26 catalogs: Upper-Div GE Area B
Prerequisite: Junior standing or Mathematics major; completion of GE Area 1 with grades of C- or better (GE Area A for the 2020-26 catalogs); and completion of GE Area 2 with a grade of C- or better (GE Area B4 for the 2020-26 catalogs); and MATH 241 or MATH 2263; and one of the following: MATH 242, MATH 244, MATH 2341, or MATH 2343.

Elementary analytic functions and mappings. Cauchy-Riemann equations. Cauchy's Integral Theorem. Taylor and Laurent series. Theory of residues and evaluation of integrals. Winding number, the argument principle, and Rouche's theorem. 3 lectures. Fulfills GE Areas Upper-Division 2 or Upper-Division 5 (GE Area Upper-Division B for students on the 2020-26 catalogs).

MATH 3351 Differential Equations and Boundary Value Problems (3 units)
Term Typically Offered: F
2026-28 or later: Upper-Div GE Area 2/5
2020-26 catalogs: Upper-Div GE Area B
Prerequisite: Junior standing or one of the following: Biomedical Engineering major, Mathematics major, or Mechanical Engineering major; completion of GE Area 1 with grades of C- or better (GE Area A for the 2020-26 catalogs); and completion of GE Area 2 with a grade of C- or better (GE Area B4 for the 2020-26 catalogs); and one of the following: MATH 242, MATH 244C, MATH 2341, or MATH 2343; and one of the following: MATH 241, DATA/MATH 1265, or MATH 2263.

Linear theory and methods applied to the solution of differential equations. Series solutions and Frobenius theory. Bases and orthogonality in function spaces, Gram-Schmidt orthogonalization. Regular and singular Sturm-Liouville theory. Fourier series and transforms. Special functions of applied mathematics. 3 lectures. Fulfills GE Areas Upper-Division 2 or Upper-Division 5 (GE Area Upper-Division B for students on the 2020-26 catalogs). Formerly MATH 344.

MATH 3370 Putnam Exam Seminar (1 unit)
Term Typically Offered: F
CR/NC
Prerequisite: Consent of instructor.

Directed group study of mathematical problem-solving techniques. Class members are expected to participate in the annual William Lowell Putnam Mathematical Competition. Credit/No Credit grading only. Repeatable up to 4 units. 1 seminar. Formerly MATH 370.

MATH 3371 Math Modeling Seminar (2 units)
Term Typically Offered: F
CR/NC
Prerequisite: Consent of instructor.

Directed group study of mathematical modeling techniques. Class members are expected to participate in the annual Mathematical Competition in Modeling. Credit/No Credit grading only. Repeatable up to 8 units. 2 seminars. Formerly MATH 371.

MATH 3481 Mathematics for Elementary Teaching I (4 units)
Term Typically Offered: F, SP
Prerequisite: Liberal Studies major; junior standing, LS 230, or LS 2230; and completion of GE Area 2 (GE Area B4 for the 2020-26 catalogs).

Introduction to reasoning about quantities, numeration, number sense, meaning of rational numbers, and operations on whole numbers, fractions and decimals. Algebraic reasoning related to early elementary mathematics including operations. 4 lectures.

MATH 3482 Mathematics for Elementary Teaching II (4 units)
Term Typically Offered: F, SP
Prerequisite: MATH 3481 with a grade of C- or better.

Introduction to number theory including prime numbers, composite numbers, and divisibility. The relationship between ratios, rates, and proportions. Problem solving using proportional reasoning. Algebraic reasoning related to patterns and to linear, quadratic, and exponential functions. 4 lectures.

MATH 3483 Mathematics for Elementary Teaching III (3 units)
Term Typically Offered: F, SP
Prerequisite: MATH 3482 with a grade of C- or better.

Introduction to measurement, congruence and similarity, transformational geometry, polygons and polyhedra. 3 lectures.

MATH 3511 Euclidean Geometry (3 units)
Term Typically Offered: SP
Prerequisite: MATH 248 or MATH 2031 with a grade of C- or better, or consent of instructor.

Foundations of Euclidean geometry, including constructions, congruence theorems, similarity, polygonal regions, circles, measurement and properties of angles. Includes history of the parallel postulate and principles of neutral geometry. 3 lectures. Formerly MATH 442.

MATH 3622 Mathematics of Data Science (3 units)
Term Typically Offered: F
Prerequisite: One of the following: MATH 206, MATH 244, MATH 1151, or MATH 2341; MATH 248 or MATH 2031; and CSC 101 or CSC 1001.

Introduction to mathematical foundations of data science including regression, data dimension reduction, clustering, community detection, and computational topology, with a focus on advanced linear algebra tools needed to establish the mathematical foundations of methods, to show convergence, and for error minimization. 3 lectures. Crosslisted as DATA/MATH 3622.

MATH 3651 Introduction to Numerical Analysis (3 units)
Term Typically Offered: F
Prerequisite: One of the following: MATH 242, MATH 244, MATH 2341, or MATH 2343; and one of the following: MATH 241, DATA/MATH 1265, or MATH 2263; and CSC 101 or CSC 1001.

Introduction to basic numerical methods including finite precision arithmetic and error propagation, root-finding methods, interpolation, numerical differentiation and quadrature, direct and iterative methods for systems of linear equations, and numerical methods for eigenvalue problems and data fitting. 3 lectures. Formerly MATH 451.

MATH 3680 Typesetting with LaTeX (1 unit)
Term Typically Offered: F
CR/NC
Prerequisite: Junior standing.

Preparing documents, especially mathematical ones, using the LaTeX typesetting software. Credit/No Credit grading only. 1 lecture. Formerly MATH 351.

MATH 3681 Mathematical Programming (3 units)
Term Typically Offered: SP
Prerequisite: One of the following: MATH 206, MATH 244, MATH 1151, or MATH 2341; and one of the following: MATH 241, DATA/MATH 1265 or MATH 2263; and CSC 101 or CSC 1001.

Symbolic and numerical mathematical algorithms. Recursive problem solving. Formulation of mathematical conjectures from data. Assessment of conjectures using generated data. 3 lectures. Formerly MATH 350.

MATH 3971 Technology in Mathematics Education (3 units)
Term Typically Offered: F
Prerequisite: MATH 248 or MATH 2031.

Examination of current technologies designed for teaching and exploring mathematics. Exploration of mathematics content and problem solving with technology. Consideration of what mathematics content is appropriate for incorporating technology. Emphasis on activity learning and applications. 3 lectures. Formerly MATH 300.

MATH 4052 Combinatorics II (3 units)
Term Typically Offered: F
Prerequisite: Graduate standing in Mathematics, MATH 334, or MATH 3051.

Methods of discrete mathematics. Formal power series and generating functions, the exponential formula, integer partitions, permutation statistics, q-analogues, Polya theory, posets, Möbius inversion. Additional concepts may include asymptotics, Lagrange inversion, symmetric functions, rook theory, hypergeometric series, the probabilistic method. 3 lectures. Formerly MATH 435.

MATH 4201 Abstract Algebra I (4 units)
Term Typically Offered: F, SP
Prerequisite: One of the following: Graduate standing in Mathematics, MATH 306, MATH 341, MATH 3111, or MATH 3152.

Introduction to the study of groups and rings. Permutation groups, cyclic and dihedral groups, Lagrange's theorem, conjugation, quotient groups, isomorphism theorems, and automorphisms; basic ring types, ring homomorphisms, ideals, quotients, prime and maximal ideals, factorization in commutative rings. 4 lectures. Formerly offered as part of the MATH 481, 482, 483 series, students may not earn credit for both MATH 481 and MATH 4201.

MATH 4202 Abstract Algebra II (3 units)
Term Typically Offered: SP
Prerequisite: MATH 482 or MATH 4201.

Introduction to field theory. Factorization in polynomial rings, field extensions and Kronecker's theorem, splitting fields, finite fields, Galois groups and Galois field extensions, fundamental theorem of Galois theory. 3 lectures. Formerly offered as part of the MATH 481, 482, 483 series, students may not earn credit for both MATH 483 and MATH 4202.

MATH 4211 Abstract Algebra I Workshop (1 unit)
Term Typically Offered: TBD
CR/NC
Corequisite: Enrollment in the associated section of MATH 4201.

Facilitated study and discussion of the methods and techniques of proof in abstract algebra. Credit/No Credit grading only. 1 laboratory. Formerly MATH 491.

MATH 4264 Real Analysis I (4 units)
Term Typically Offered: F, SP
Prerequisite: Graduate standing in Mathematics, MATH 306, or MATH 3152.

Introduction to concepts and methods basic to real analysis. Concepts may include the real number system, sequences, continuity, differentiation and Riemann integration of functions of a single real variable. 4 lectures. Formerly offered as part of the MATH 412, 413, 414 series, students may not earn credit for both MATH 412 and MATH 4264.

MATH 4265 Real Analysis II (4 units)
Term Typically Offered: SP
Prerequisite: MATH 413 or MATH 4264.

Further introduction to concepts and methods basic to real analysis. Concepts may include sequences and series of functions, differentiability of functions of several variables, Implicit and/or Inverse Function theorems, Riemann integration in several variables, and other advanced topics in real analysis. 4 lectures. Formerly offered as part of the MATH 412, 413, 414 series, students may not earn credit for both MATH 414 and MATH 4265.

MATH 4274 Real Analysis I Workshop (1 unit)
Term Typically Offered: TBD
CR/NC
Corequisite: Enrollment in the associated section of MATH 4264.

Facilitated study and discussion of the methods and techniques of proof in real analysis. Credit/No Credit grading only. 1 laboratory. Formerly MATH 422.

MATH 4342 Nonlinear Dynamical Systems (3 units)
Term Typically Offered: SP
Prerequisite: One of the following: MATH 242, MATH 244, MATH 2341, or MATH 2343, and one of the following: MATH 241, DATA/MATH 1265, or MATH 2263; or graduate standing in Mathematics.

Qualitative theory of ordinary differential equations: Existence and Uniqueness Theorem, phase portraits, limit sets, stability of fixed points and periodic orbits, energy functions, Poincare-Bendixson Theorem, Poincare maps, bifurcations, attractors, chaos. Not open to students with credit in PHYS 428 or PHYS 4428. 3 lectures. Formerly MATH 416.

MATH 4352 Partial Differential Equations (3 units)
Term Typically Offered: F
Prerequisite: Graduate standing in Mathematics or MATH 3351.

Introduction to partial differential equations. Transport equations, wave equation, heat equation, and Laplace's equation. The D'Alembert solution to the wave equation, method of characteristics, Green's functions, the maximum principle, separation of variables, Fourier series/transforms, and operator eigenvalue problems. 3 lectures. Formerly MATH 418.

MATH 4400 Special Problems for Advanced Undergraduates (1-3 units)
Term Typically Offered: TBD
Prerequisite: Junior standing and consent of department chair.

Individual investigation, research, studies, or surveys of special problems. Repeatable up to 6 units. Formerly MATH 400.

MATH 4424 Teaching Mathematics in Secondary School (4 units)
Term Typically Offered: F
CR/NC
Prerequisite: Admission into the Mathematics Single Subject Credential Program or consent of instructor.

Research-based methods of teaching and learning mathematics in secondary schools with an emphasis on planning instruction and designing effective assessment and learning experiences for all students. Introduction to current issues in mathematics education. For students who will be teaching in secondary schools. Credit/No Credit grading only. 4 lectures. Formerly MATH 424.

MATH 4425 Mathematics Teaching Clinical Experience Seminar (2 units)
Term Typically Offered: SP
CR/NC
Prerequisite: Admission into the Single Subject Mathematics Credential Program. Corequisite: EDUC 469 or EDUC 4469.

Principles and practice in effective teaching of mathematics at the secondary level, learning theories, curriculum content and structure, classroom issues, and the teaching profession. Credit/No Credit grading. 2 seminars. Formerly MATH 425.

MATH 4461 Senior Project I (2 units)
Term Typically Offered: F, SP, SU
Prerequisite: Senior standing.

Selection and development of a capstone mathematics project under direct faculty supervision. Formerly MATH 461.

MATH 4462 Senior Project II (1 unit)
Term Typically Offered: F, SP, SU
Prerequisite: MATH 461 or MATH 4461.

Completion of a capstone mathematics project under direct faculty supervision. Project results are presented in a formal report. Formerly MATH 462.

MATH 4463 Senior Project Seminar (3 units)
Term Typically Offered: F, SP
Prerequisite: One of the following: MATH 412, MATH 481, MATH 4201, or MATH 4264.

Written and oral analysis and presentation of topics in advanced mathematics. This capstone course in mathematics involves work in a range of mathematical fields, including linear algebra, number theory, graph theory, abstract algebra, and analysis. Not open to students with credit in MATH 460 or MATH 4464. 3 seminars. Formerly MATH 459.

MATH 4464 Senior Project Applied Seminar (3 units)
Term Typically Offered: F
Prerequisite: One of the following: CSC 101, CSC 1001, MATH 350, or MATH 3681; and MATH 306 or MATH 3152; and MATH 344 or MATH 3351.

Written and oral analysis and presentation of topics in applied mathematics and mathematical modeling. Construct and analyze mathematical models using a range of mathematical fields, including linear algebra, differential equations, numerical analysis, dynamical systems, and data analytics. Not open to students with credit in MATH 459 or MATH 4463. 3 seminars. Formerly MATH 460.

MATH 4470 Special Advanced Topics (1-3 units)
Term Typically Offered: TBD
Prerequisite: Consent of instructor.

Directed group study of special topics for advanced students. The Class Schedule will list topic selected. Repeatable up to 6 units. 1 to 3 lectures. Formerly MATH 470.

MATH 4480 Advanced Seminar in Mathematics (1 unit)
Term Typically Offered: TBD
CR/NC
Prerequisite: MATH 306 or MATH 3152; and consent of instructor.

Exploration of advanced topics and problems in mathematics through reading, writing and oral presentations. The Class Schedule will list subtitle selected. Credit/No Credit grading only. Repeatable up to 4 units. 1 seminar. Formerly MATH 474.

MATH 4485 Cooperative Education Experience (4 units)
Term Typically Offered: TBD
CR/NC
Prerequisite: Sophomore standing and consent of department chair.

Part-time work experience in business, industry, government, and other areas of student career interest. Positions are paid and usually require relocation. Formal report and evaluation by work supervisor required. Repeatable up to 8 units. Credit/No Credit grading only. Formerly MATH 485.

MATH 4495 Cooperative Education Experience (8 units)
Term Typically Offered: TBD
CR/NC
Prerequisite: Sophomore standing and consent of department chair.

Full-time work experience in business, industry, government, and other areas of student career interest. Positions are paid and usually require relocation. Formal report and evaluation by work supervisor required. Credit/No Credit grading only. Formerly MATH 495.

MATH 4512 Non-Euclidean Geometry (3 units)
Term Typically Offered: F
Prerequisite: Graduate standing in Mathematics, MATH 442, or MATH 3511.

Non-Euclidean geometries, including spherical, hyperbolic, and projective geometry. Properties of geodesics, parallels, biangles, Saccheri and Lambert quadrilaterals, angle-sum, area, Pythagorean Theorem, trigonometry, duality, perspectivity, and fundamental theorems. 3 lectures. Formerly MATH 443.

MATH 4531 Differential Geometry (3 units)
Term Typically Offered: F
Prerequisite: MATH 241 or MATH 2263, and one of the following: MATH 206, MATH 244, MATH 1151, or MATH 2341; or graduate standing in Mathematics.

The theory of curves and surfaces in Euclidean space. May include curvature and torsion of curves, Frenet formulas, covariant derivatives, Cartan structural equations, shape operator, curvature of surfaces, geodesics, Gauss-Bonnet Theorem, and geometric surfaces. 3 lectures. Formerly MATH 404.

MATH 4541 Introduction to Topology (3 units)
Term Typically Offered: F
Prerequisite: Graduate standing in Mathematics, MATH 412, or MATH 4264. Corequisite: MATH 481 or MATH 4201.

Introduction to topological spaces. Metric spaces, open and closed sets, continuity, compactness, connectedness. Quotient spaces. Covering spaces and the fundamental group. 3 lectures. Formerly MATH 440.

MATH 4652 Numerical Differential Equations (3 units)
Term Typically Offered: SP
Prerequisite: Graduate standing in Mathematics, MATH 451, or MATH 3651. Recommended: MATH 344 or MATH 3351.

Finite-difference methods for boundary-value problems described by ordinary and elliptic partial differential equations. Numerical methods for initial-value problems described by ordinary differential equations and systems thereof. Finite-difference methods for initial-boundary-value problems described by parabolic and hyperbolic partial differential equations. 3 lectures. Formerly MATH 452.

MATH 4653 Numerical Optimization (3 units)
Term Typically Offered: SP
Prerequisite: Graduate standing in Mathematics, MATH 451, or MATH 3651. Recommended: MATH 306 or MATH 3152.

Algorithms for solving constrained and unconstrained optimization problems. Line searches, gradient methods, Newton's method; conjugate gradient, backpropagation, and global search methods. Linear programming and nonlinear constrained optimization methods including simplex and non-simplex methods. 3 lectures. Formerly MATH 453.

MATH 4911 Game Theory (3 units)
Term Typically Offered: SP
Prerequisite: MATH 248 or MATH 2031, and one of the following: MATH 206, MATH 244, MATH 1151, or MATH 2341; or graduate standing in Mathematics.

Mathematical concepts, techniques, and models used to investigate strategies in competitive situations, matrix games, linear programming, nonzero sum games, evolutionarily stable systems, indices of power, Nash arbitration. May include multiplayer games, fair division, and combinatorial game theory. 3 lectures. Formerly MATH 437.

MATH 4972 Advanced Mathematics for Teaching (3 units)
Term Typically Offered: SP
Prerequisite: MATH 442 or MATH 3511; and MATH 481 or MATH 4201.

Advanced exploration of the mathematics taught in California's public high schools and middle schools through problem analysis, concept analysis, and problem connections. Introduction to mathematics education research. 3 lectures. Formerly MATH 423.

MATH 4981 Advanced Topics in Mathematics (3 units)
Term Typically Offered: TBD
Prerequisite: Graduate standing in Mathematics, MATH 306, or MATH 3152; and consent of instructor.

Exploration of advanced topics and problems in mathematics. The Class Schedule will list subtitle selected. Repeatable up to 6 units. 3 lectures. Formerly MATH 475.

MATH 4982 Advanced Topics in Applied Mathematics (3 units)
Term Typically Offered: TBD
Prerequisite: Graduate standing in Mathematics, MATH 306, or MATH 3152; and consent of instructor.

Exploration of advanced topics and problems in applied mathematics. The Class Schedule will list subtitle selected. Repeatable up to 6 units. 3 lectures. Formerly MATH 476.

MATH 5041 Transition to Graduate Mathematics (3 units)
Term Typically Offered: F
Prerequisite: Graduate standing.

Interactive construction and analysis of mathematical proof and exposition at the graduate level. Concepts drawn from standard advanced material in real analysis, linear algebra, and modern algebra. Repeatable up to 6 units. 1 lecture, 2 seminars. Formerly MATH 548.

MATH 5053 Discrete Mathematics (3 units)
Term Typically Offered: F
Prerequisite: Graduate standing, MATH 435, or MATH 4052.

Advanced discrete mathematics. Concepts may include the representation theory of the symmetric group, tableaux combinatorics, the RSK algorithm, lattice paths, extremal combinatorics, hypergeometric series algorithms and proof machines, expander families of graphs, Ramsey theory, or finite state machines. 3 lectures. Formerly MATH 530.

MATH 5203 Linear Algebra and Module Theory (3 units)
Term Typically Offered: F
Prerequisite: Completion of the Graduate Written Examination in Algebra.

Modules, basic theorems, products and coproducts via universal properties, free modules, and modules over a PID. Applications to linear operators, bilinear forms, corresponding matrix groups; spectral theorems for Hermitian, normal, and unitary operators. Singular values, applications, and introduction to categories. 3 lectures. Formerly MATH 560.

MATH 5204 Algebra (3 units)
Term Typically Offered: SP
Prerequisite: Completion of the Graduate Written Exam in Algebra.

Action of a group on a set, semi-direct products, solvable groups, p-groups, Sylow theorems, classification of groups of small order, group presentations, finitely generated abelian groups, matrix groups, and advanced concepts. 3 lectures.

MATH 5266 Real Analysis (3 units)
Term Typically Offered: F
Prerequisite: Completion of the Graduate Written Examination in Analysis.

Introduction to measure and integration, Lebesgue measure, Lebesgue integration, convergence theorems, Fubini's Theorem and the Radon-Nikodym Theorem. 3 lectures. Formerly MATH 550.

MATH 5302 Applied Complex Analysis (3 units)
Term Typically Offered: SP
Prerequisite: Graduate standing in Mathematics, MATH 410, or MATH 3301.

Complex variables and associated topics. Branch cuts, series and product expansions. Asymptotic evaluation of integrals. Conformal mapping; applications and examples. Fourier and Laplace transforms and applications. 3 lectures. Formerly MATH 520.

MATH 5371 Methods of Applied Mathematics (3 units)
Term Typically Offered: F
Prerequisite: One of the following: Graduate standing in Mathematics, MATH 410, MATH 412, MATH 3301, or MATH 4264.

Advanced mathematical methods of analysis in science and engineering, integrated with modeling of physical phenomena. Asymptotics, perturbation methods, and boundary layer analysis. Additional content to be drawn from WKB theory, multi-scale analysis, and the calculus of variations. 3 lectures. Formerly MATH 521.

MATH 5500 Individual Study (1-3 units)
Term Typically Offered: F, SP, SU
Prerequisite: Graduate standing in Mathematics and consent of department chair.

Individual research or advanced study planned and completed under the direction of a departmental faculty member. Open only to graduate students demonstrating ability to do independent work. Repeatable up to 9 units. Formerly MATH 500.

MATH 5542 Topology (3 units)
Term Typically Offered: SP
Prerequisite: Graduate standing in Mathematics, MATH 440, or MATH 4541.

General topological spaces with an emphasis on surfaces and manifolds. Concepts may include fundamental groups and covering spaces, simplicial and singular homology, and differential topology. 3 lectures. Formerly MATH 541.

MATH 5570 Special Advanced Topics (1-3 units)
Term Typically Offered: TBD
Prerequisite: Graduate standing and consent of instructor.

Directed group study of special topics for graduate students. The Class Schedule will list topic selected. Repeatable up to 6 units. 1 to 3 lectures. Formerly MATH 570.

MATH 5580 Seminar (1-3 units)
Term Typically Offered: TBD
Prerequisite: Graduate standing in Mathematics and consent of instructor.

Built around topics in advanced mathematics chosen according to the common interests and needs of the students enrolled. Each seminar will have a subtitle according to the nature of the content. The Class Schedule will list subtitle selected. Repeatable up to 9 units. 1 to 3 seminars. Formerly MATH 580.

MATH 5597 Comprehensive Examination (0 units)
Term Typically Offered: TBD
CR/NC
Prerequisite: Graduate standing in Mathematics and consent of department chair.

Culminating oral exam for a non-thesis master's student in mathematics showing integration of knowledge, critical and independent thinking, and mastery of the subject matter. Scheduled with the faculty advisor, typically in the final semester of the graduate program. Credit/No Credit grading only.

MATH 5599 Thesis (2-3 units)
Term Typically Offered: F, SP, SU
Prerequisite: Graduate standing in Mathematics and consent of instructor.

Serious research endeavor devoted to the development, pedagogy or learning of mathematics. Repeatable up to 5 units. Formerly MATH 599.

MATH 5651 Numerical Analysis (3 units)
Term Typically Offered: SP
Prerequisite: Graduate standing; or CSC 101 or CSC 1001, and one of the following: AERO 300, AERO 3300, MATH 344, or MATH 3351.

Introduction to advanced numerical analysis. Numerical techniques for solving ordinary and partial differential equations, error analysis, stability, and methods for linear systems. 3 lectures. Formerly MATH 502.

MATH 5691 Applied Mathematics for Engineers (3 units)
Term Typically Offered: F
Prerequisite: Graduate standing; or one of the following: AERO 300, AERO 3300, MATH 344, or MATH 3351.

Introduction to advanced methods of mathematics useful in the analysis of engineering problems. Concepts may include perturbation theory, optimization and Fourier analysis. Not open to students with credit in MATH 521 or MATH 5371. Not open to Mathematics majors or Master's degree in Mathematics students. 3 lectures. Formerly MATH 501.

MATH 5971 Graduate Teaching Seminar (1 unit)
Term Typically Offered: F
CR/NC
Prerequisite: Graduate standing.

Principles and practice in effective teaching of college-level mathematics. Issues related to present and future teaching experiences, including time management, professionalism, student assessment, classroom management, and qualities of good teachers. Reflection on individual teaching, and consideration of improvements in instruction. Credit/No Credit grading only. 1 seminar. Formerly MATH 505.

MTH Courses

MTH 999L College Algebra and Trigonometry Support Laboratory (1 unit)
Term Typically Offered: F, SP
CR/NC
Corequisite: MTH 100 or MTH 1100.

Offered at Solano Campus. Support for college algebra and trigonometry. Content will include just-in-time skill development needed for topics college algebra and trigonometry as well as focused support for the learning of topics in college algebra and trigonometry. 1 laboratory. Formerly MTH 99L at Cal Maritime.

MTH 1100 College Algebra and Trigonometry (4 units)
Term Typically Offered: F, SP
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4

Offered at Solano Campus. Polynomial, rational, logarithmic, exponential, and trigonometric functions and their inverses, with graphical representation of all of the above. Additional topics include systems of equations, introductory matrix algebra, and vectors in the plane. 4 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). Formerly MTH 100 at Cal Maritime.

MTH 1101 College Algebra (3 units)
Term Typically Offered: F, SP

Offered at Solano Campus. Exponents, factoring, linear and quadratic equations, absolute value, inequalities, functions, graphing, polynomial and rational functions, exponential and logarithmic functions, systems of equations, with graphical representations 3 lectures. Formerly MTH 101 at Cal Maritime.

MTH 1105 Finite Mathematics for Business (3 units)
Term Typically Offered: TBD
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: MTH 100 or MTH 1100 with a grade of C- or better; or MTH 101 or MTH 1101 with a grade of C- or better.

Offered at Solano Campus. Introduction to mathematical concepts in business and finance, including linear systems of equations and inequalities, linear programming, sets, counting and probability. 3 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). Formerly MTH 105 at Cal Maritime.

MTH 1107 Elementary Statistics (3 units)
Term Typically Offered: F, SP
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: MTH 100 or MTH 1100 with a grade of C- or better; or MTH 101 or MTH 1101 with a grade of C- or better.

Offered at Solano Campus. Introduction to general concepts in statistics, including descriptive methods, graphical representations of data, sampling, distributions, statistical inference, confidence intervals, hypothesis tests, correlation and basic probability. Technology will be used extensively to describe and analyze data. 3 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). Formerly MTH 107 at Cal Maritime.

MTH 2205 Calculus for Business (3 units)
Term Typically Offered: TBD
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: MTH 100 or MTH 1100 with a grade of C- or better.

Offered at Solano Campus. Focuses on basics of calculus and the application to business decision-making and problem solving. Concentrate on formulae that will be performed on Excel later in the curriculum. Math theory and math models. Exercises in critical thinking and model building will be introduced, along with the application of these two tools to the quantitative analysis of business problems. 3 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). Formerly MTH 205 at Cal Maritime.

MTH 2210 Calculus I (4 units)
Term Typically Offered: F, SP
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: MTH 100 or MTH 1100 with a grade of C- or better.

Offered at Solano Campus. Introduction of functions and limits, differentiation, applications of differentiation, integration, and applications of the definite integral. 4 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). Formerly MTH 210 at Cal Maritime.

MTH 2211 Calculus II (4 units)
Term Typically Offered: F, SP
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: MTH 210 or MTH 2210 with a grade of C- or better.

Offered at Solano Campus. An introduction to additional methods of integration and improper integrals. Presented are trigonometric and hyperbolic functions and their inverses; infinite sequences and series; and a brief introduction to linear, ordinary first, and second-order differential equations. 4 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). Formerly MTH 211 at Cal Maritime.

MTH 2212 Calculus III (4 units)
Term Typically Offered: F
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: MTH 211 or MTH 2211 with a grade of C- or better.

Offered at Solano Campus. Introduction to the algebra and calculus of vectors. Functions of several variables and partial differentiation, as well as multiple integration and vector analysis. 4 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). Formerly MTH 212 at Cal Maritime.

MTH 2215 Differential Equations (3 units)
Term Typically Offered: SP
2026-28 or later catalog: GE Area 2
2020-26 catalogs: GE Area B4
Prerequisite: MTH 211 or MTH 2211 with a grade of C- or better.

Offered at Solano Campus. First and second-order differential equations with constant coefficients. Higher order linear differential equations. Linear systems and eigenvector methods. Emphasis on engineering applications. 3 lectures. Fulfills GE Area 2 with a grade of C- or better (GE Area B4 for students on the 2020-26 catalogs). Formerly MTH 215 at Cal Maritime.

MTH 2250 Introduction to Linear Algebra (3 units)
Term Typically Offered: F
Prerequisite: MTH 211 or MTH 2211 with a grade of C- or better.

Offered at Solano Campus. Theory and applications of linearity, including vectors, matrices, systems of linear equations, dot and cross products, determinants, linear transformations in Euclidean space, linear independence, bases, eigenvalues, eigenvectors, and diagonalization. 3 lectures. Formerly MTH 250 at Cal Maritime.

MTH 3320 Probability and Statistics (3 units)
Term Typically Offered: F
Prerequisite: One of the following: MTH 212, MTH 2212, MTH 215, or MTH 2215; and MTH 250 or MTH 2250.

Offered at Solano Campus. Introduction to probability and its application in statistics. Foundations of probability, discrete and continuous random variables, conditional probability, special distributions such as the uniform, exponential and normal distributions, joint distributions, limit theorems, statistical inference both frequentist and Bayesian, and random processes. 3 lectures. Formerly MTH 320 at Cal Maritime.

MTH 3380 Introduction to Mathematical Modeling (3 units)
Term Typically Offered: F
Prerequisite: One of the following: MTH 212, MTH 2212, MTH 215, or MTH 2215; and MTH 250 or MTH 2250.

Offered at Solano Campus. Introduction to the formulation and analysis of mathematical models. Discrete, continuous, and stochastic modeling frameworks. Emphasis will be problem-driven (as opposed to method-driven) applications of mathematics with a focus on the design and analysis of models using both analytical and computational simulation approaches. 3 lectures. Formerly MTH 380 at Cal Maritime.

MTH 3390 Independent Study (1-3 units)
Term Typically Offered: TBD
Prerequisite: Consent of the department.

Offered at Solano Campus. Substantial study above and beyond the regular offerings in the Academy catalog. Arrangement needed with an Academy faculty member to be the Independent Study Advisor. Approved application for Independent Study must be on file. Formerly MTH 390 at Cal Maritime.

MTH 3395 Special Topics (1-3 units)
Term Typically Offered: SP
Prerequisite: Consent of instructor.

Offered at Solano Campus. Special topic courses are intended to enable each department to offer an elective course of study when faculty scholarship activities, the expertise of visiting faculty, or off-campus educational programs may afford a unique and worthwhile learning experience. 1 to 3 lectures. Formerly MTH 395 at Cal Maritime.