

MATHEMATICS

Mathematics (MATH)

MATH 10 - Mathematics for General Education (4 units)

Letter Grade (LG) Only • Total hours: 68 hours lecture

This course offers a historical study of elementary mathematics and discussion of philosophic differences of ancient and modern mathematics. Topics from modern mathematics, such as set theory, symbolic logic, modular systems, and the axioms of various number systems are covered. Portions of instruction may be offered online; may also be offered fully online.

Prerequisite(s): Placement based on multiple measures; or MATH 263

Advisory: Completion of or concurrent enrollment in ENGL 1A or ENGL 1AE

Credit transferable: Transfers to CSU & UC

GE Credit: CSU B4 Mathematics/Quantitative Reasoning; IGETC 2A

Mathematical Concepts/Quantitative Reasoning; MPC A2 Communication and Analytical Thinking

MATH 12 - Number Systems (4 units)

Letter Grade (LG) or Pass/No Pass (P/NP) • Total hours: 68 hours lecture

This course focuses on the development of quantitative reasoning skills through in-depth, integrated explorations of topics in mathematics, including real number systems and subsystems. Emphasis is on comprehension and analysis of mathematical concepts and applications of logical reasoning. Portions of instruction may be offered online; may also be offered fully online. [C-ID MATH 120]

Prerequisite(s): Placement based on multiple measures; or MATH 263

Advisory: Completion of or concurrent enrollment in ENGL 1A or ENGL 1AE

Credit transferable: Transfers to CSU & UC

GE Credit: CSU B4 Mathematics/Quantitative Reasoning; MPC A2

Communication and Analytical Thinking

MATH 13 - Pre-Calculus (5 units)

Letter Grade (LG) Only • Total hours: 85 hours lecture

This course reviews polynomial, exponential, and logarithmic functions; trigonometric functions; theory of equations; binomial theorem; conic sections; inverse functions; and trigonometric equations. Additional topics from coordinate geometry and DeMoivre's Theorem are covered. Credit may be earned only once for either MATH 13 or MATH 13A; either MATH 13 or MATH 13B; either MATH 13 or both MATH 13A and MATH 13B. Portions of instruction may be offered online; may also be offered fully online.

Prerequisite(s): Placement based on multiple measures; or MATH 263

Advisory: Completion of or concurrent enrollment in ENGL 1A

Credit transferable: Transfers to CSU & UC

GE Credit: CSU B4 Mathematics/Quantitative Reasoning; IGETC 2A

Mathematical Concepts/Quantitative Reasoning; MPC A2 Communication and Analytical Thinking

MATH 13A - College Algebra for STEM (4 units)

Letter Grade (LG) Only • Total hours: 68 hours lecture

This is a college-level course in algebra for majors in science, technology, engineering, and mathematics and is designed, together with MATH 13B (Trigonometry), to prepare students for Calculus. Topics include polynomial, rational, radical, exponential, absolute value, and logarithmic functions; systems of equations; theory of polynomial equations; and analytic geometry. Credit may be earned only once for either MATH 13 or MATH 13A. Portions of instruction may be offered online; may also be offered fully online.

Prerequisite(s): Placement based on multiple measures; or Intermediate algebra or higher or eligibility for transfer-level mathematics

Advisory: Completion of or concurrent enrollment in ENGL 1A or ENGL 1AE

Credit transferable: Transfers to CSU & UC

GE Credit: CSU B4 Mathematics/Quantitative Reasoning; MPC A2

Communication and Analytical Thinking

MATH 13B - Trigonometry (3 units)

Letter Grade (LG) Only • Total hours: 51 hours lecture

This course, together with MATH 13A (College Algebra for STEM), is designed to prepare students for Calculus. It covers the study of trigonometric functions, their inverses and their graphs, identities and proofs related to trigonometric expressions, trigonometric equations, solving right triangles, solving triangles using the Law of Cosines and the Law of Sines, polar coordinates, and an introduction to vectors. Credit may be earned only once for either MATH 13 or MATH 13B. Portions of instruction may be offered online; may also be offered fully online.

Prerequisite(s): Placement based on multiple measures; or Intermediate algebra or higher or eligibility for transfer-level mathematics

Advisory: Completion of or concurrent enrollment in ENGL 1A or ENGL 1AE

Credit transferable: Transfers to CSU

GE Credit: CSU B4 Mathematics/Quantitative Reasoning; MPC A2

Communication and Analytical Thinking

MATH 16 - Elementary Statistics (4 units)

Letter Grade (LG) or Pass/No Pass (P/NP) • Total hours: 68 hours lecture

This course covers the use of probability techniques, hypothesis testing, and predictive techniques to facilitate decision-making. Topics include descriptive statistics; probability and sampling distributions; statistical inference; correlation and linear regression; analysis of variance, chi-square and t-tests; and application of technology for statistical analysis, including the interpretation of the relevance of the statistical findings. It covers applications using data from disciplines including business, social sciences, psychology, life science, health science, and education. This course also contains a computer component. Calculations are done with the aid of a desktop computer or with a handheld calculator/computer having built-in functions. Portions of instruction may be offered online; may also be offered fully online. [C-ID MATH 110]

Prerequisite(s): Placement based on multiple measures; or MATH 260; or MATH 263

Advisory: Completion of or concurrent enrollment in ENGL 1A

Credit transferable: Transfers to CSU & UC

UC Transfer Limits: MATH 16, PSYC 19, SOCI 19 combined: maximum credit, 1 course

GE Credit: CSU B4 Mathematics/Quantitative Reasoning; IGETC 2A

Mathematical Concepts/Quantitative Reasoning; MPC A2 Communication and Analytical Thinking

MATH 17 - Finite Math (4 units)

Letter Grade (LG) Only • Total hours: 68 hours lecture

This course is suitable for students of mathematics, philosophy, biological and behavioral sciences, business, and economics. Topics include selections from symbolic logic, sets, linear programming, probability theory, statistics, and game theory, with selected applications from business, social sciences, biological science, and behavioral science. Portions of instruction may be offered online; may also be offered fully online. [C-ID MATH 130]

Prerequisite(s): Placement based on multiple measures; or MATH 263

Advisory: Completion of or concurrent enrollment in ENGL 1A

Credit transferable: Transfers to CSU & UC

GE Credit: CSU B4 Mathematics/Quantitative Reasoning; IGETC 2A

Mathematical Concepts/Quantitative Reasoning; MPC A2 Communication and Analytical Thinking

MATH 18 - Calculus and Analytic Geometry for Biology/Social Science/Bu (4 units)

Letter Grade (LG) Only • Total hours: 68 hours lecture

This course covers polynomials, rational, exponential, and logarithmic functions; graphs, limits, derivatives, differentiation techniques, and applications of the derivative; integration and applications of the integral; functions of several variables; and partial derivatives. The course is designed for students in biology, social sciences, business, and management. This course is not a substitute for MATH 20A. Portions of instruction may be offered online; may also be offered fully online. [C-ID MATH 140]

Prerequisite(s): Placement based on multiple measures; or MATH 263

Advisory: Completion of or concurrent enrollment in ENGL 1A

Credit transferable: Transfers to CSU & UC

UC Transfer Limits: MATH 18, MATH 20A combined: maximum credit, 1 course

GE Credit: CSU B4 Mathematics/Quantitative Reasoning; IGETC 2A

Mathematical Concepts/Quantitative Reasoning; MPC A2 Communication and Analytical Thinking

MATH 20A - Calculus with Analytic Geometry I (4 units)

Letter Grade (LG) Only • Total hours: 68 hours lecture; 17 hours lab

This is a first course in differential and integral calculus of a single variable: functions, limits and continuity, techniques and applications of differentiation and integration, and the Fundamental Theorem of Calculus. This course is primarily for science, technology, engineering, and math majors. Portions of instruction may be offered online; may also be offered fully online. [C-ID MATH 210]

Prerequisite(s): Placement based on multiple measures; or MATH 13

Credit transferable: Transfers to CSU & UC

UC Transfer Limits: MATH 18, MATH 20A combined: maximum credit, 1 course

GE Credit: CSU B4 Mathematics/Quantitative Reasoning; IGETC 2A

Mathematical Concepts/Quantitative Reasoning; MPC A2 Communication and Analytical Thinking

MATH 20B - Calculus with Analytic Geometry II (4 units)

Letter Grade (LG) Only • Total hours: 68 hours lecture; 17 hours lab

This is a second course in differential and integral calculus of a single variable: integration, techniques of integration, infinite sequences and series, polar and parametric equations, and applications of integration. Primarily for science, technology, engineering, and math majors. Portions of instruction may be offered online; may also be offered fully online. [C-ID MATH 220]

Prerequisite(s): MATH 20A

Credit transferable: Transfers to CSU & UC

GE Credit: CSU B4 Mathematics/Quantitative Reasoning; IGETC 2A

Mathematical Concepts/Quantitative Reasoning

MATH 20C - Calculus of Several Variables (4 units)

Letter Grade (LG) Only • Total hours: 68 hours lecture; 17 hours lab

This course covers vector valued functions, calculus of functions of more than one variable, partial derivatives, multiple integration, Green's Theorem, Stokes' Theorem, and the divergence theorem. Portions of instruction may be offered online; may also be offered fully online. [C-ID MATH 230]

Prerequisite(s): MATH 20B

Credit transferable: Transfers to CSU & UC

GE Credit: CSU B4 Mathematics/Quantitative Reasoning; IGETC 2A

Mathematical Concepts/Quantitative Reasoning

MATH 31 - Linear Algebra (4 units)

Letter Grade (LG) Only • Total hours: 68 hours lecture

This course develops the techniques and theory needed to solve and classify systems of linear equations. Solution techniques include row operations, Gaussian elimination, and matrix algebra. Investigates the properties of vectors in two and three dimensions, leading to the notion of an abstract vector space. Vector space and matrix theory are presented including topics such as inner products, norms, orthogonality, eigenvalues, eigenspaces, and linear transformations. Selected applications of linear algebra are included. Portions of instruction may be offered online; may also be offered fully online. [C-ID MATH 250]

Prerequisite(s): MATH 20A

Advisory: Completion of or concurrent enrollment in ENGL 1A or ENGL 1AE

Credit transferable: Transfers to CSU & UC

GE Credit: CSU B4 Mathematics/Quantitative Reasoning; IGETC 2A

Mathematical Concepts/Quantitative Reasoning

MATH 32 - Differential Equations (4 units)

Letter Grade (LG) Only • Total hours: 68 hours lecture

The course is an introduction to ordinary differential equations including both quantitative and qualitative methods as well as applications from a variety of disciplines. It introduces the theoretical aspects of differential equations, including establishing when solution(s) exist, and techniques for obtaining solutions, including, series solutions, and singular points, Laplace transforms, and linear systems. Portions of instruction may be offered online; may also be offered fully online. [C-ID MATH 240]

Prerequisite(s): MATH 20B or higher

Advisory: Completion of or concurrent enrollment in ENGL 1A or ENGL 1AE

Credit transferable: Transfers to CSU & UC

GE Credit: CSU B4 Mathematics/Quantitative Reasoning; IGETC 2A

Mathematical Concepts/Quantitative Reasoning

MATH 40 - Discrete Mathematics (3 units)

Letter Grade (LG) Only • Total hours: 51 hours lecture; 17 hours lab

In this course students are introduced to discrete mathematical systems. Topics include logic, recursion, induction, sets, equivalence and order relations, functions, introduction to trees, graph theory, proofs, circuit minimization techniques, network models, combinatorics, complexity, algebraic structures, coding machines. Portions of instruction may be offered online; may also be offered fully online. [C-ID MATH 160]

Prerequisite(s): MATH 20A

Credit transferable: Transfers to CSU & UC

GE Credit: CSU B4 Mathematics/Quantitative Reasoning; IGETC 2A Mathematical Concepts/Quantitative Reasoning

MATH 260 - Pre-Statistics (5 units)

Letter Grade (LG) Only • Total hours: 85 hours lecture

This course prepares students for Elementary Statistics (MATH 16). Students develop the quantitative reasoning skills necessary for success in statistics through hands-on exploration with data. Topics include working with numerical information (fractions, decimals, percentages), evaluating expressions related to statistical formulas, graphical and numerical descriptive statistics for quantitative and categorical data including two-way tables and linear regression, and an introduction to the normal distribution. There is a focus on the reading, writing, and critical thinking skills needed for statistics. This course is appropriate for students who do NOT plan to major in math, science, computer science, business, technology, engineering, or other calculus intensive fields. This course can serve as the prerequisite for Elementary Statistics (MATH 16) and Introduction to Statistics for the Social Sciences (PSYC 19 / SOCI 19). It may not be used to satisfy the pre-requisite for any other course. Portions of instruction may be offered online; may also be offered fully online.

Advisory: Most students should enroll directly into transfer level math courses. Students are strongly encouraged to refer to the math sequence chart or see a counselor before enrolling in this course.

Credit transferable: Non-transferable

MATH 261 - Beginning Algebra (5 units)

Letter Grade (LG) Only • Total hours: 85 hours lecture

This course includes an introduction to basic algebraic principles, simple linear equations, positive and negative numbers, the four basic arithmetic operations using monomials and polynomials, literal equations, reading and constructing graphs, systems of linear equations, applications of principles to verbal problems, factoring, fractions and equations containing fractions, square roots and radicals, quadratic equations, and ratios and proportion. Portions of instruction may be offered online; may also be offered fully online.

Advisory: Most students should enroll directly into transfer level math courses. Students are strongly encouraged to refer to the math sequence chart or see a counselor before enrolling in this course.

Credit transferable: Non-transferable

MATH 263 - Intermediate Algebra and Coordinate Geometry (5 units)

Letter Grade (LG) Only • Total hours: 85 hours lecture

This course covers properties of real numbers, complex numbers, polynomials, exponential and logarithmic functions, first- and second-degree equations and inequalities, systems of equations, progressions, graphs of conics, determinants, and an introduction to coordinate geometry. Portions of instruction may be offered online; may also be offered fully online.

Advisory: Most students should enroll directly into transfer level math courses. Students are strongly encouraged to refer to the math sequence chart or see a counselor before enrolling in this course.

Credit transferable: Non-transferable

GE Credit: MPC A2 Communication and Analytical Thinking

MATH 313 - Support for Pre-Calculus (0 units)

Pass/No Pass (P/NP) Only • Total hours: 34 hours lab

This course is intended for students concurrently enrolled in MATH 13, Pre-Calculus. Students review the needed core skills, competencies, and concepts. It is intended for majors in science, technology, engineering, and mathematics. Topics include a review of computational skills developed in intermediate algebra, factoring, operations on rational and radical expressions, absolute value equations and inequalities, exponential and logarithmic expressions and equations, conic sections, functions including composition and inverses, an in-depth focus on quadratic functions, and a review of topics from geometry. This course is appropriate for students who are confident in their graphing and beginning algebra skills. Portions of instruction may be offered online; may also be offered fully online.

Corequisite(s): MATH 13

MATH 316 - Support for Elementary Statistics (0 units)

Pass/No Pass (P/NP) Only • Total hours: 34 hours lab

This course is for students concurrently enrolled in MATH 16. Students review algebraic, geometric, and arithmetic procedures and concepts that underlie statistical formulas and concepts, do hands-on activities that promote a deeper understanding of statistical ideas, and practice study skills that promote success in MATH 16. Portions of instruction may be offered online; may also be offered fully online.

Corequisite(s): MATH 16

MATH 317 - Support for Finite Mathematics (0 units)

Pass/No Pass (P/NP) Only • Total hours: 34 hours lab

Support for Finite Mathematics is for students concurrently enrolled in MATH 17. It offers a review of the core skills, competencies, and concepts needed in Finite Mathematics. Topics include a review of computational skills developed in Intermediate Algebra, factoring, operations on rational and radical expressions, linear, exponential and logarithmic expressions and equations, an introduction to matrices, functions including composition and inverses, and quadratic functions. Portions of instruction may be offered online; may also be offered fully online.

Corequisite(s): MATH 17

MATH 318 - Support for Calculus and Analytic Geometry(Biol/SocSci/Busi) (0 units)*Pass/No Pass (P/NP) Only • Total hours: 34 hours lab*

This course is intended for students currently enrolled in MATH 18 and is intended for majors business. It offers a review of the core skills, competencies, and concepts needed in business calculus. Topics include a review of computational skills developed in intermediate algebra, factoring, operations on rational and radical expressions, linear, exponential and logarithmic expressions and equations, an introduction to matrices, functions including composition and inverses, and an in-depth focus on quadratic functions. This course is appropriate for students who are confident in their graphing and beginning algebra skills. Portions of instruction may be offered online; may also be offered fully online.

*Corequisite(s): MATH 18***MATH 351 - Pre-Algebra (5 units)***Pass/No Pass (P/NP) Only • Total hours: 85 hours lecture*

This course is a review of basic arithmetic operations, plus an introduction to elementary topics in algebra. Portions of instruction may be offered online; may also be offered fully online.

Advisory: Most students should enroll directly into transfer level math courses. Students are strongly encouraged to refer to the math sequence chart or see a counselor before enrolling in this course.

MATH 440 - Supervised Tutoring: Mathematics (0 units)*Non Credit • Total hours: 8.5-340 hours lab*

This course is designed to provide supervised tutoring for students concurrently enrolled in a basic skills mathematics course or any course that requires basic mathematics skills to complete the course work. Portions of instruction may be offered online; may also be offered fully online.

Enrollment limitation(s): Instructor referral and/or approval required to participate.

Repeatable: Noncredit

Math Learning Center

The Math Learning Center offers an individualized instruction to assist those students who are currently enrolled in basic skills mathematics classes. The student may work with an instructor and tutor.

MATH 440 - Supervised Tutoring: Mathematics (0 units)*Non Credit • Total hours: 8.5-340 hours lab*

This course is designed to provide supervised tutoring for students concurrently enrolled in a basic skills mathematics course or any course that requires basic mathematics skills to complete the course work. Portions of instruction may be offered online; may also be offered fully online.

Enrollment limitation(s): Instructor referral and/or approval required to participate.

Repeatable: Noncredit