

MATHEMATICS (MATH)

MATH 013 Intermediate Algebra 5 Units

This course continues the Algebra sequence and is a prerequisite to transfer level math courses. Students will review elementary algebra topics and further their skills in solving absolute value in equations and inequalities, quadratic functions and complex numbers, radicals and rational exponents, exponential and logarithmic functions, inverse functions, and sequences and series.

Lecture Hours: 5 Lab Hours: None Repeatable: No Grading: O
Prerequisite: MATH 111 with P grade or equivalent
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: None Degree Applicable: AS
CSU GE: None IGETC: None District GE: None

MATH 014 Geometry 3 Units

Students will study logical proofs, simple constructions, and numerical calculations. The course involves the study of plane geometric figures and relationships.

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: O
Prerequisite: MATH 111 with P grade or placement based on math assessment
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: None Degree Applicable: AS
CSU GE: None IGETC: None District GE: None

MATH 020 College Algebra 3 Units

Students will solve equations and related applications for polynomial, absolute value, rational, radical, exponential, and logarithmic functions. Students will also analyze problems involving inequalities, systems of equations, matrices, complex numbers, sequences, and series. (C-ID MATH 150)

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L
Prerequisite: Intermediate Algebra or appropriate placement beyond Intermediate Algebra
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: B4 IGETC: 2A District GE: B4

MATH 020X Just-In-Time Support for College Algebra 2 Units

Students will receive "just-in-time" review of the core prerequisite skills, competencies, and concepts needed for students concurrently enrolled in MATH 020, College Algebra. Topics include: a review of computational skills developed in intermediate algebra, factoring, dividing polynomials, solving linear, absolute value, quadratic, radical, exponential, and logarithmic equations, linear and nonlinear inequalities, functions including composition and inverses. This course is appropriate for students who are confident in beginning algebra skills. This course is recommended for students advised to receive additional academic and concurrent support. Students are strongly encouraged to meet with an academic counselor.

Lecture Hours: 2 Lab Hours: None Repeatable: No Grading: O
Corequisite: MATH 020
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: None Degree Applicable: NAA
CSU GE: None IGETC: None District GE: None

MATH 021 Precalculus Algebra 4 Units

Students will study topics which include basic algebraic concepts, complex numbers, equations and inequalities, graphs of functions, linear and quadratic functions, polynomial functions of higher degree, rational, exponential, absolute value, and logarithmic functions, sequences and series, and conic sections. This course is designed to prepare students for the level of algebra required in calculus. Students may not take a combination of MATH 021 and MATH 025. (C-ID MATH 151)

Lecture Hours: 4 Lab Hours: None Repeatable: No Grading: L
Prerequisite: Intermediate Algebra or appropriate placement beyond Intermediate Algebra.
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: B4 IGETC: 2A District GE: B4
Credit by Exam: Yes

MATH 021X Just-In-Time Support for Precalculus Algebra 2 Units

Students will receive "just-in-time" review of the core prerequisite skills, competencies, and concepts needed in Precalculus. Intended for majors in science, technology, engineering, and mathematics who are concurrently enrolled in MATH 21 Precalculus. Topics include: a review of computational skills developed in intermediate algebra, factoring, operations on rational and radical expressions, absolute value equations and inequalities, functions including composition and inverses, and an in-depth focus on quadratic functions. This course is appropriate for students who are confident in beginning algebra skills. This course is recommended for students advised to receive additional academic and concurrent support. Students are strongly encouraged to meet with an academic counselor.

Lecture Hours: 2 Lab Hours: None Repeatable: No Grading: K
Corequisite: MATH 021
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: None Degree Applicable: NAA
CSU GE: None IGETC: None District GE: None

MATH 022 Trigonometry 3 Units

Students will study trigonometric functions and equations, basic identities, graphing, inverse trigonometric functions, vectors, polar coordinates, and polar equations. This course in numerical and analytical trigonometry is designed to prepare students for the level of trigonometry and advanced algebraic concepts necessary for calculus. Students may not take a combination of MATH 022 and MATH 025. (C-ID MATH 851)

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L
Prerequisite: Intermediate Algebra or appropriate placement beyond Intermediate Algebra
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU Degree Applicable: AA/AS
CSU GE: B4 IGETC: None District GE: B4
Credit by Exam: Yes

MATH 022X Just-In-Time Support for Trigonometry 2 Units

Students will receive "just-in-time" review of the core prerequisite skills, competencies, and concepts needed in Trigonometry. MATH 22X is intended for majors in science, technology, engineering, and mathematics who are concurrently enrolled in MATH 22 Trigonometry. Topics include: angles, circles, triangles, a review of algebra skills such as factoring, dividing polynomials, solving linear, quadratic, polynomial, radical, absolute value equations, solving inequalities, applying the concept of a function, including composition of functions and an inverse function. This course is recommended for students advised to receive additional academic and concurrent support. Students are strongly encouraged to meet with an academic counselor.

Lecture Hours: 2 Lab Hours: None Repeatable: No Grading: K
 Corequisite: MATH 022
 Advisory Level: Read: None Write: None Math: None
 Transfer Status: None Degree Applicable: NAA
 CSU GE: None IGETC: None District GE: None

MATH 025 Precalculus Algebra and Trigonometry 6 Units

Students will study basic algebraic concepts, complex numbers, equations and inequalities, graphs of functions, system of equations and inequalities, linear and quadratic functions, polynomial functions of higher degree, rational, exponential, logarithmic, and trigonometric functions, inverse functions, basic identities, vectors, polar coordinates and graphs, and conic sections. This course is an intensive combined course in college algebra and trigonometry designed primarily as preparation for calculus. Students may take both MATH 021 and MATH 022 or take only MATH 025. (C-ID MATH 955)

Lecture Hours: 6 Lab Hours: None Repeatable: No Grading: L
 Prerequisite: Intermediate Algebra or appropriate placement beyond Intermediate Algebra.
 Advisory Level: Read: 3 Write: 3 Math: None
 Transfer Status: CSU/UC Degree Applicable: AA/AS
 CSU GE: B4 IGETC: 2A District GE: B4
 Credit by Exam: Yes

MATH 025X Just-In-Time Support for Precalculus Algebra and Trigonometry 2 Units

Students will receive "just-in-time" review of the core prerequisite skills, competencies, and concepts needed in Precalculus Algebra and Trigonometry. Intended for majors in science, technology, engineering, and mathematics who are concurrently enrolled in MATH 25 Precalculus Algebra and Trigonometry. Topics include: a review of computational skills developed in intermediate algebra, factoring, operations on rational and radical expressions, absolute value equations and inequalities, functions including composition and inverses, an in-depth focus on quadratic functions, and topics from geometry such as congruent and similar triangles properties. This course is appropriate for students who are confident in beginning algebra skills. This course is recommended for students advised to receive additional academic and concurrent support. Students are strongly encouraged to meet with an academic counselor.

Lecture Hours: 2 Lab Hours: None Repeatable: No Grading: K
 Corequisite: MATH 025
 Advisory Level: Read: None Write: None Math: None
 Transfer Status: None Degree Applicable: NAA
 CSU GE: None IGETC: None District GE: None

MATH 052 Mathematics for Elementary Education 3 Units

Students will study the development of quantitative reasoning skills through in-depth exploration of the structures of the real number system and subsystems, elementary number theory, and the use of manipulatives to present mathematical concepts to children. Students will develop lesson plans and teaching techniques appropriate for an elementary school setting. Additionally, there will be an emphasis on comprehension and analysis of mathematical concepts and applications of logical reasoning. Mathematics 52 is designed especially for prospective elementary school teachers. (C-ID MATH 120)

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L
 Prerequisite: Intermediate Algebra or appropriate placement beyond Intermediate Algebra
 Advisory Level: Read: 3 Write: 3 Math: None
 Transfer Status: CSU/UC Degree Applicable: AA/AS
 CSU GE: B4 IGETC: None District GE: B4

MATH 054 Mathematics for Technical Fields 3 Units

Students will learn and apply mathematical concepts and skills that are used in technical fields, such as solar energy, sustainable energy, heating, ventilation, and air conditioning (HVAC), machine technology, and skilled construction, including plumbing, electrical, and construction management. Topics include geometry, measurement, basic statistics, trigonometric functions and algebraic thinking. This college-level course will focus on practical, real-world applications, utilizing problem-solving skills, including estimating and modeling.

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L
 Recommended: Elementary Algebra or the equivalent
 Advisory Level: Read: 3 Write: 3 Math: None
 Transfer Status: CSU Degree Applicable: AA/AS
 CSU GE: None IGETC: None District GE: None

MATH 061 Finite Mathematics 3 Units

Students will study how to apply algebra to solve problems in economics, the behavioral sciences, and the social sciences. Course topics include systems of linear equations and inequalities, matrices, linear programming, set theory, counting techniques, probability theory, and the mathematics of finance. (C-ID MATH 130)

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L
 Prerequisite: Intermediate Algebra or appropriate placement beyond Intermediate Algebra.
 Advisory Level: Read: 3 Write: 3 Math: None
 Transfer Status: CSU/UC Degree Applicable: AA/AS
 CSU GE: B4 IGETC: 2A District GE: B4

MATH 062 Calculus for Business and the Social Sciences 3 Units

Students study functions and graphs; limits; continuity; differentiation and integration of polynomials, rational functions, power functions, exponential functions, and logarithmic functions; partial differentiation; and applications of these topics in business and social science. This course includes single variable calculus and an introduction to multivariable calculus with applications for students majoring in business or social science. (C-ID MATH 140)

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L
 Prerequisite: MATH 020 or MATH 021 or MATH 025 with C or better
 Advisory Level: Read: 3 Write: 3 Math: None
 Transfer Status: CSU/UC Degree Applicable: AA/AS
 CSU GE: B4 IGETC: 2A District GE: B4

MATH 063 Elementary Statistics 3 Units

Students are introduced to the study of statistics. Students will learn methods of displaying data, descriptive statistics, basic concepts of probability theory, random variables, common statistical distributions, estimates and sample size, hypothesis testing, tests of two independent population parameters, tests of 3 or more population means or proportions (Chi-square, one-way ANOVA), and regression and correlation. Students will apply basic statistical concepts to data from education, business, social sciences, and natural sciences. To aid in the analysis of data, the use of computational technology will be required. (C-ID MATH 110)

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L
Prerequisite: Intermediate Algebra or appropriate placement beyond Intermediate Algebra.

Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: B4 IGETC: 2A District GE: B4

MATH 063X Just-In-Time Support for Elementary Statistics 2 Units

Students will receive "just-in-time" review of skills, concepts and competencies needed to succeed in statistics. This course will cover topics from arithmetic, pre-algebra, elementary and intermediate algebra that are required for statistics. Students will also develop and practice study skills that promote success in MATH 063 Elementary Statistics. This course is recommended for students advised to receive additional academic and concurrent support. Students are strongly encouraged to meet with an academic counselor.

Lecture Hours: 2 Lab Hours: None Repeatable: No Grading: K
Corequisite: MATH 063

Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: None Degree Applicable: NAA
CSU GE: None IGETC: None District GE: None

MATH 070 Discrete Mathematics 4 Units

Students prepare for further study in mathematics, computer science, or other sciences. Students will learn and apply concepts and ideas in logic, Boolean algebra, methods of proofs, induction, sequences, set theory, counting techniques, probability, recursion, relations, graphs, and trees. (C-ID MATH 160)

Lecture Hours: 4 Lab Hours: None Repeatable: No Grading: L
Prerequisite: (MATH 021 and MATH 022) or MATH 025, all with C or better, or equivalent

Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: B4 IGETC: 2A District GE: B4
Credit by Exam: Yes

MATH 071 Calculus I With Analytic Geometry 5 Units

Students study functions and inverse functions, limits, the derivative as a limit, continuity, rules of differentiation, chain rule, implicit differentiation, applications of differentiation, linear approximations, related rates, optimization problems, antiderivatives, Riemann sums, the Fundamental Theorem of Calculus, and the substitution rule for integration. This is the first course in calculus for students majoring in mathematics, physical science, computer science, or engineering. (C-ID MATH 210)

Lecture Hours: 5 Lab Hours: None Repeatable: No Grading: L
Prerequisite: (MATH 021 and MATH 022) or MATH 025, all with C or better
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: B4 IGETC: 2A District GE: B4
Credit by Exam: Yes

MATH 071H Honors Calculus I With Analytic Geometry 5 Units

Students study functions and inverse functions, limits, the formal definition of the limit, the derivative as a limit, continuity, rules of differentiation, chain rule, implicit differentiation, applications of differentiation, linear approximations, related rates, optimization problems, antiderivatives, Riemann sums, the Fundamental Theorem of Calculus, and the substitution rule for integration. This is the first course in the calculus sequence for students majoring in mathematics, physical science, computer science, or engineering. As an honors course the focus will extend the understanding the theory and application of differential calculus through projects, extended readings, or programming and computational problems. (C-ID MATH 210)

Lecture Hours: 5 Lab Hours: None Repeatable: No Grading: L
Prerequisite: (MATH 021 and MATH 022) or MATH 025, all with C or better
Advisory Level: Read: 4 Write: 4 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: B4 IGETC: 2A District GE: B4
Credit by Exam: Yes

MATH 072 Calculus II with Analytic Geometry 5 Units

Students study techniques of integration, applications of integration to areas, volumes, average values of functions, arc lengths, surfaces of revolution, problems in physics and engineering, use of parametric equations and polar equations to plot curves and compute derivatives, areas and arc length, a thorough study of infinite sequences, infinite and power series, and an introduction to differential equations. (C-ID MATH 220)

Lecture Hours: 5 Lab Hours: None Repeatable: No Grading: L
Prerequisite: MATH 071 with C or better.
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: B4 IGETC: 2A District GE: B4
Credit by Exam: Yes

MATH 073 Multivariable Calculus 5 Units

Students study the concepts of differential and integral calculus extended to multivariable functions. The course content includes vectors; dot products; cross products; surfaces in three dimensions; derivatives, integrals, arc length and curvature for vector-valued functions; partial derivatives; the chain rule; tangent planes; maximum and minimum values of functions of several variables; the Lagrange multiplier method; multiple integrals; and vector calculus. This is the third course in calculus for students majoring in mathematics, physical science, computer science, or engineering. (C-ID MATH 230)

Lecture Hours: 5 Lab Hours: None Repeatable: No Grading: L
Prerequisite: MATH 072 with C or better.
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: B4 IGETC: 2A District GE: B4
Credit by Exam: Yes

MATH 078 Differential Equations 4 Units

Students will study ordinary differential equations and their applications, including methods for solving first order equations, linear equations of arbitrary orders, and systems of linear differential equations. Students are introduced to Laplace transforms, series solutions, and some theoretical aspects of differential equations such as existence and uniqueness of solutions, the phase plane, and stability of equilibrium solutions for autonomous equations. (C-ID MATH 240)

Lecture Hours: 4 Lab Hours: None Repeatable: No Grading: L
Prerequisite: MATH 072 with C or better.
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: B4 IGETC: 2A District GE: B4
Credit by Exam: Yes

MATH 079 Linear Algebra 3 Units

Students study systems of linear equations, matrices, determinants, vector spaces and their properties, linear transformations, eigenvalues and eigenvectors, diagonalization, inner product vector spaces, orthogonality, and applications. This course is designed for students majoring in mathematics, computer science, statistics, or engineering. (C-ID MATH 250)

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L
Prerequisite: MATH 072 with C or better.
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: B4 IGETC: 2A District GE: B4
Credit by Exam: Yes

MATH 080 Discrete Structures for Computer Science 4 Units

Students will be introduced to the discrete structures used in Computer Science. Students will learn and apply concepts and ideas in the following topics: functions, relations, set theory, logic, methods of proof, counting principles, discrete probability, recursion, graphs, and trees. (C-ID COMP 152)

Lecture Hours: 4 Lab Hours: None Repeatable: No Grading: L
Prerequisite: Take CIS 025C or CIS 054 or CIS 084 and MATH 025 or MATH 021 and MATH 022; with a C or better
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC Degree Applicable: AA/AS
CSU GE: B4 IGETC: 2A District GE: B4
Credit by Exam: Yes

MATH 098 Directed Study in Mathematics 0.5-9 Units

Individual or small groups of students who would benefit from Independent Study under the direction of faculty members in specific or related disciplines may develop individualized learning contracts designed to enhance their individual instructional programs. The students and the faculty member in consultation with the Division Dean will determine appropriate learning objectives and activities as well as the number of units to be earned. Instructions and the Learning Contract forms are available in the Division office. Repeatable to a maximum of 9 units across all disciplines.

Lecture Hours: None Lab Hours: 2.07 Repeatable: Yes Grading: O
Prerequisite: Completion of the following course(s) and project approval is required by sponsoring faculty, division dean, and Vice President of Academic Affairs, MATH 025 or MATH 063 with C or better grade
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU Degree Applicable: AA/AS
CSU GE: None IGETC: None District GE: None

MATH 111 Elementary Algebra 5 Units

Students will study operations on real numbers and algebraic expressions, linear equations and inequalities, and algebraic methods for solving application problems. They will also study systems of linear equations, laws of exponents, operations on polynomials, solving quadratic equations by factoring, and operations on rational expressions and rational equations.

Lecture Hours: 5 Lab Hours: None Repeatable: No Grading: K
Recommended: Completion of MATH 512.
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: None Degree Applicable: NAA
CSU GE: None IGETC: None District GE: None

MATH 501 Review of Common Core Integrated Mathematics I 0 Units

Students will review the concepts and ideas in Common Core Integrated Mathematics I, including algebraic expressions and equations, functions, congruence, expressing geometric properties with equations, and interpreting categorical and quantitative data.

Lecture Hours: 3 Lab Hours: None Repeatable: Yes Grading: N
Recommended: Perform basic arithmetic operations, create linear equations; solve linear equations in one variable, both algebraically and graphically; define, evaluate, and compare basic linear functions; use linear functions to model relationships among quantities; and solve systems of linear equations in two variables.
Transfer Status: None Degree Applicable: NC
CSU GE: None IGETC: None District GE: None

MATH 502 Review of Common Core Integrated Mathematics II 0 Units

Students will review the concepts and ideas in Common Core Integrated Mathematics II, including algebraic expressions and equations, functions, congruence, expressing geometric properties with equations, and interpreting categorical and quantitative data.

Lecture Hours: 3 Lab Hours: None Repeatable: Yes Grading: N

Recommended: Completion of Common Core Integrated Mathematics I or the equivalent.

Transfer Status: None Degree Applicable: NC

CSU GE: None IGETC: None District GE: None

MATH 503 Review of Common Core Integrated Mathematics III 0 Units

Students will review the concepts and ideas in Common Core Integrated Mathematics II, including algebraic expressions and equations, functions, congruence, expressing geometric properties with equations, and interpreting categorical and quantitative data.

Lecture Hours: 3 Lab Hours: None Repeatable: Yes Grading: N

Recommended: Completion of Common Core Integrated Mathematics II or equivalent.

Transfer Status: None Degree Applicable: NC

CSU GE: None IGETC: None District GE: None

MATH 512 Prealgebra 0 Units

This is a noncredit course designed to give students the mathematical foundation they need to be successful in an elementary algebra course. Topics include integers, fractions, decimals, percents, order of operations, unit conversions, algebraic expressions, equations, basic geometric shapes, graphing and basic applications.

Lecture Hours: 3 Lab Hours: None Repeatable: Yes Grading: N

Transfer Status: None Degree Applicable: NC

CSU GE: None IGETC: None District GE: None

MATH 521 Math for Medical Assisting 0 Units

Students solve problems and do calculations encountered in the Medical Assisting field. Basic math concepts are applied to problems such as conversion within the Metric system and conversion between Decimal and Metric systems.

Lecture Hours: 1.5 Lab Hours: None Repeatable: Yes Grading: N

Advisory Level: Read: 3 Write: 3 Math: None

Transfer Status: None Degree Applicable: NC

CSU GE: None IGETC: None District GE: None