MATHEMATICS (MATH)

MATH 013 Intermediate Algebra  5 Units
This course continues the algebra sequence and is a prerequisite to college level math courses. Students will review the first course in algebra and explore further the real number system, properties of algebraic systems, absolute value in equations and inequalities, complex numbers, properties of rational exponents and logarithms, roots and radicals, functions, inverse functions, and introduction to sequences and series. Content may include determinants, Cramer's rule, matrices, simultaneous solutions of sets of equations, or conic sections.

Lecture Hours: 5  Lab Hours: None  Repeatable: No  Grading: O
Prerequisite: MATH 111 with P grade or placement based on assessment
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
The course involves the study of plane geometric figures and relationships. Students will study logical proofs, constructions, and numerical calculations. Additional topics in solid geometry and analytic geometry may be covered. This course is highly recommended for anyone who has not taken or wishes to review high school geometry.

Lecture Hours: 3  Lab Hours: None  Repeatable: No  Grading: O
Prerequisite: MATH 111 with P grade or placement based on assessment
Recommended: Completion of MATH 013 or equivalent
Advisory Level: Read: 3  Write: 3  Math: None
Transfer Status: None  Degree Applicable: AS
CSU GE: None  IGETC: None  District GE: None
Credit by Exam: Yes

MATH 016 Algebra With Geometric Concepts  7 Units
This course combines beginning algebra, intermediate algebra, and selected topics in geometry to prepare students for college level math courses. Students will explore linear, quadratic, rational, radical, exponential, and logarithmic functions and equations. The course covers absolute value in equations and inequalities, complex numbers, functions as mathematical models, inverse functions, and systems of linear equations. It also includes geometric congruence, properties of polygons, parallel lines, similarity, areas, and volumes.

Lecture Hours: 7  Lab Hours: None  Repeatable: No  Grading: L
Recommended: Basic knowledge of arithmetic or pass MATH 310 or MATH 311 with a C or better
Advisory Level: Read: 2  Write: 2  Math: None
Transfer Status: None  Degree Applicable: AS
CSU GE: None  IGETC: None  District GE: None

MATH 021 Precalculus Algebra  4 Units
This course is designed to prepare students for the level of algebra required in calculus. Topics will include basic algebraic concepts, complex numbers, equations and inequalities, graphs of functions, systems of equations and inequalities, linear and quadratic functions, polynomial functions of higher degree, rational, exponential and logarithmic functions, matrices and determinants and analytic geometry. Students will not receive credit for both MATH 021 and MATH 025.

Lecture Hours: 4  Lab Hours: None  Repeatable: No  Grading: L
Prerequisite: MATH 013 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 022 Trigonometry  3 Units
This course in numerical and analytical trigonometry is designed to prepare students for the level of trigonometry and advanced algebraic concepts necessary for calculus. Topics include degree and radian measurements of angles, right triangle trigonometry, unit circle trigonometry, graphs of trigonometric functions, algebraic manipulation and proof of trigonometric identities, inverse trigonometric functions, solving trigonometric equations, the Laws of Sines and Cosines, vectors, the polar coordinate system, and roots and powers of complex numbers (De Moivre's Theorem). Students will not receive credit for both MATH 022 and MATH 025. (C-ID MATH 851)

Lecture Hours: 3  Lab Hours: None  Repeatable: No  Grading: L
Prerequisite: MATH 013 and MATH 014; both with C or better or equivalent
Advisory Level: Read: 3  Write: 3  Math: None
Transfer Status: CSU  Degree Applicable: AA/AS
CSU GE: B4  IGETC: None  District GE: B4

MATH 025 Precalculus Algebra and Trigonometry  6 Units
This course is an intensive combined course in college algebra and trigonometry designed primarily as preparation for calculus. 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, trigonometric equations, solving right triangles, solving triangles using the Law of Cosines and the Law of Sines, vectors, polar coordinates, and analytic geometry. Students may take both MATH 021 and MATH 022 or take only MATH 025.

Lecture Hours: 6  Lab Hours: None  Repeatable: No  Grading: L
Prerequisite: MATH 013 and MATH 014, both 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 052 Math for Elementary Education 3 Units
This course covers arithmetic theory and operations necessary for the teaching of mathematical concepts to elementary school children. The course includes basic set theory and logic, number theory, numeration systems and their history, modular arithmetic, mathematical patterns and sequences, and the structure and properties of integers, real and rational numbers. Designed for prospective multiple subject credential candidates. (C-ID MATH 120)

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L
Prerequisite: MATH 013 and MATH 014; both with C or better
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 061 Finite Mathematics 3 Units
Finite Mathematics is the application of skills acquired in algebra to problems in business, management, economics, and the social sciences. Course content includes 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: MATH 013 or MATH 016 both with C or better or placement by multiple measures
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 Social Science 3 Units
This course presents single variable calculus and an introduction to multivariable calculus and their applications for business and social science students. The content includes functions and graphs, limits, continuity, differential and integral calculus of polynomials, rational functions, power functions, exponential functions, logarithmic and natural logarithmic functions, partial differentiation and applications of these topics in business and social science. (C-ID MATH 140)

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L
Prerequisite: MATH 021 or MATH 025; either 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
This course is an introduction to the study of statistics. Students will learn methods of collecting data, displaying data, descriptive statistics with emphasis on understanding variation, empirical probability, probability distributions, sampling distributions, confidence intervals and sample size, hypothesis testing, testing the difference between two independent population parameters, matched pairs analysis, one-way analysis of variance, chi-square tests, correlation and simple linear regression. (C-ID MATH 110)

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L
Prerequisite: MATH 013 or MATH 016 with C or better or placement by multiple measures
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 064 Integrated Statistics I 5 Units
This is the first semester of a two-semester course sequence in Integrated Statistics. Statistical topics include collecting data, displaying data, descriptive statistics, correlation, linear regression, bivariate categorical data, and probability distributions. Algebra topics include slope, linear and exponential models, and exponential growth and decay. Application problems will be taken from engineering, education, sports, psychology, medicine, political science, business, economics, and sociology. This course is intended for CSU-bound students with majors that require no mathematics beyond freshman-level statistics. It is not appropriate for students with majors in math, science, computer science, or business, nor for students desiring to transfer to a private university.

Lecture Hours: 5 Lab Hours: None Repeatable: No Grading: O
Prerequisite: MATH 310 or MATH 311 with P grade
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: None Degree Applicable: NAA
CSU GE: None IGETC: None District GE: None

MATH 065 Integrated Statistics II 5 Units
This is the second semester of a two-semester course sequence in Integrated Statistics. Statistical topics include sampling distributions, Central Limit Theorem, confidence intervals, hypothesis testing, inference for proportions, inference for two means (independent and dependent samples), ANOVA, chi-square tests, correlation, and linear regression. Algebra topics include functions, linear and exponential functions, power models, linear inequalities, and proportional relationships (including variation) with applications. Application problems will be taken from engineering, education, sports, psychology, medicine, political science, business, economics, and sociology. This course is intended for CSU-bound students with majors that require no mathematics beyond freshman-level statistics. It is not appropriate for students with majors in math, science, computer science, or business, nor for students desiring to transfer to a private university.

Lecture Hours: 5 Lab Hours: None Repeatable: No Grading: L
Prerequisite: MATH 064 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 066 Calculus I Late Transcendentals for Stem 4 Units
This is the first course in calculus for students majoring in Computer Science, Data Science, or Economics, as well as the Natural Sciences, Technology, Engineering and Mathematics. Students will study functions, limits, continuity, techniques and applications of differentiation and integration, and the Fundamental Theorem of Calculus.

Lecture Hours: 4 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
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>MATH 071</td>
<td><strong>Calculus I With Analytic Geometry</strong> 5 Units</td>
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<td>This is the first course in calculus for students majoring in mathematics, physical science, computer science, or engineering. 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. (C-ID MATH 210)</td>
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<td>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</td>
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<td>MATH 072</td>
<td><strong>Calculus II With Analytic Geometry</strong> 5 Units</td>
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<td>This is the second course in calculus and analytic geometry for students majoring in mathematics, physical sciences, computer science, or engineering. Topics include are 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 series, and power series, and an introduction to differential equations. (C-ID MATH 220)</td>
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<td>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</td>
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<td>MATH 073</td>
<td><strong>Multivariable Calculus</strong> 5 Units</td>
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<td>This is the third course in calculus for students majoring in mathematics, physical science, computer science, or engineering. In this course, the concepts of differential and integral calculus are extended to multivariable functions. The course content includes vectors in two and three dimensional space, vector-valued functions, differentials, gradients, multiple integrals, vector fields, line integrals, surface integrals, and vector calculus. (C-ID MATH 230)</td>
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<td>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</td>
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<td>MATH 078</td>
<td><strong>Differential Equations</strong> 4 Units</td>
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<td>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)</td>
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<td>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</td>
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<td>MATH 079</td>
<td><strong>Linear Algebra</strong> 3 Units</td>
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<td>This course is designed for students majoring in math, statistics, physics, computer science or engineering. It develops the techniques and theory needed to solve systems of linear equations using matrices and determinants. It also investigates the properties of vector spaces. These topics will be mainly presented including orthogonality and inner product spaces, eigenvalues and eigenvectors, linear transformations and their applications. (C-ID MATH 250)</td>
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<td>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</td>
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<td>MATH 111</td>
<td><strong>Elementary Algebra</strong> 5 Units</td>
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<td>Students will study topics including operations on real numbers and algebraic expressions, solving linear equations and inequalities, algebraic methods for solving application problems, graphing linear equations and inequalities and solving systems of linear equations. It also includes laws of exponents and operations on polynomials, factoring polynomials and solving quadratic equations by factoring, and operations on rational expressions and solving rational equations.</td>
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<td>Lecture Hours: 5  Lab Hours: None  Repeatable: No  Grading: K  Prerequisite: MATH 311 with P grade or placement based on assessment  Advisory Level: Read: 2  Write: 2  Math: None  Transfer Status: None  Degree Applicable: NAA  CSU GE: None  IGETC: None  District GE: None</td>
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<td>MATH 310</td>
<td><strong>Basic Mathematics</strong> 3 Units</td>
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<td>This course is designed to give students a basic background in mathematics. Topics include operations and application problems with whole numbers, fractions, decimals and percents, prime numbers, order of operations, units of measurement, perimeters, areas, signed numbers, variables, and simple equations.</td>
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<td>Lecture Hours: 3  Lab Hours: None  Repeatable: No  Grading: K  Advisory Level: Read: 2  Write: 2  Math: None  Transfer Status: None  Degree Applicable: NAA  CSU GE: None  IGETC: None  District GE: None</td>
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MATH 311  Pre-Algebra  3 Units
This course is designed for those students who have a foundation in arithmetic but need to further develop skills before taking Elementary Algebra, and is intended to serve as a bridge between arithmetic operations and elementary algebra. Topics include integers, fractions, decimals, percents, exponents, scientific notation, order of operations, variables, algebraic expressions, equations, basic geometric shapes, and simple applications.

Lecture Hours: 3  Lab Hours: None  Repeatable: No  Grading: K
Prerequisite: 3 units of MATH 310 with P or placement based on Math assessment.
Advisory Level: Read: 2  Write: 2  Math: None
Transfer Status: None  Degree Applicable: NAA
CSU GE: None  IGETC: None  District GE: None