MATHEMATICS (MATH)

MATH 5 **1.0 UNITS**
Mathematics Learning Strategies
Class Hours: 1.0 Lecture
Total Contact Hours: 18 Lecture

Corequisite: Concurrent enrollment in MATH 104, MATH 114, MATH 116, MATH 155 or MATH 170
This course is designed to assist the student in developing learning skills and study habits that are important for all college-level coursework. Emphasis will be placed on those learning skills and study habits that are unique to the study of mathematics. The student will develop quantitative literacy by practicing arithmetic and algebraic structures including but not limited to "mathematical facts," number sense and number theory, proportional reasoning including rational expressions and equations, and the real number system and its properties. Additional topics related to the development of learning skills and study habits may include affective factors influencing learning styles and the study of mathematics, effective management of classroom learning and personal study habits, problem solving and reasoning skills, test preparation and test-taking strategies, appropriate use of technology, and support services for students of mathematics. This course is offered on a pass/no pass basis only.

MATH 70 **4.0 UNITS**
Plane Geometry
Class Hours: 4.0 Lecture
Total Contact Hours: 72 Lecture

Prerequisite: MATH 60 or equivalent with a grade of "C" or higher or "Pass" or completion of the math placement process with a score eligible for MATH 70.
This course includes the study of triangles, quadrilaterals, circles, parallels, and similar figures. Skill development involving equalities, proportions, and areas of the above figures is included. Logical thinking is stressed in problem solutions. This course is designed for students who have not taken high school plane geometry. May be taken concurrently with MATH 80, MATH 80A or MATH 80B.

MATH 104 **4.0 UNITS**
Survey of Mathematics
Class Hours: 4.0 Lecture
Total Contact Hours: 72 Lecture

Prerequisite: Courses taught at the level of Intermediate Algebra with a grade of "C" or higher or "Pass" or equivalent or appropriate placement based on the college's multiple measures process. This course is a nontechnical course surveying a variety of concepts in mathematics. Topics may include: mathematical modeling, proportional reasoning, probability, elementary statistics, finance, geometry, elementary combinatorics, pattern recognition, elementary logic, set theory, history of mathematics, mathematics of the arts, and voting theory.
Transfer Credit: CSU

MATH 105 **3.0 UNITS**
Activity-Based Probability And Statistics for Elementary And Middle School Teachers
Class Hours: 3.0 Lecture / 1.0 Laboratory
Total Contact Hours: 54 Lecture / 18 Laboratory

Prerequisite: MATH 80 or MATH 80B or equivalent with a grade of "C" or higher or "Pass" or completion of the math placement process with a score eligible for MATH courses numbered 100 level or higher and MATH 70 or equivalent with a grade of "C" or higher or "Pass."
This course will emphasize activities-based explorations of randomization, data representation, measures of central tendency, and dispersion. Coursework includes counting, basic probability, and analysis of experiments requiring hypothesizing, experimental design, and data gathering. Algebraic thinking will be used throughout the course.
Transfer Credit: CSU

MATH 110A **3.0 UNITS**
Mathematics for Elementary Teachers
Class Hours: 3.0 Lecture / 1.0 Laboratory
Total Contact Hours: 54 Lecture / 18 Laboratory

Prerequisite: Courses taught at the level of Intermediate Algebra with a grade of "C" or higher or "Pass" or equivalent or appropriate placement based on the college's multiple measures process Designed for prospective elementary and middle school teachers, this course is an introduction to problem-solving processes and strategies. Topics will include the development and analysis of the structure of and operations on the real number system. The course will include investigations on concept and process development using appropriate models, technology, manipulatives, and activities. It meets elementary education credential requirements.
Transfer Credit: CSU; UC
C-ID: MATH 120

MATH 110B **3.0 UNITS**
Mathematics for Elementary Teachers
Class Hours: 3.0 Lecture / 1.0 Laboratory
Total Contact Hours: 54 Lecture / 18 Laboratory

Prerequisite: MATH 110A or equivalent with a grade of "C" or higher or "Pass."
This course is a continuation of MATH 110A. Emphasis will be on problem solving with a focus on making tables and patterning, informal geometry, congruence similarity, constructions, transformations, tessellations, and measurement involving both English and metric units in one, two, and three dimensions. Computer explorations will be integrated into the course. The course will also emphasize hands-on modeling of real-world geometric situations. It meets elementary education credential requirements.
Transfer Credit: CSU; UC

MATH 112 **4.0 UNITS**
Elementary Statistics
Class Hours: 4.0 Lecture
Total Contact Hours: 72 Lecture

Prerequisite: Courses taught at the level of Intermediate Algebra with a grade of "C" or higher or "Pass" or equivalent or appropriate placement based on the college's multiple measures process. This course provides an introduction to descriptive and inferential statistics. Topics included are mean, standard deviation, variance, probability, random variables, binomial probability distribution, normal probability distribution, the central limit theorem, hypothesis testing, confidence intervals, t-distribution, chi-square distribution, F-distribution, linear regression, and linear correlation. This course is a beginning statistics course designed for all majors. A graphing calculator is required.
Transfer Credit: CSU; UC*
C-ID: MATH 110
*UC: credit limits may apply. MATH 112 combined with PSYC 210: maximum credit, one course.

MATH 112S **4.5 UNITS**
Enhanced Elementary Statistics
Class Hours: 4.0 Lecture / 2.0 Laboratory
Total Contact Hours: 72 Lecture / 36 Laboratory

Prerequisite: Courses taught at the level of Intermediate Algebra with a grade of "C" or higher or "Pass" or equivalent or appropriate placement based on the college's multiple measures process This course provides an introduction to descriptive and inferential statistics, with built-in just-in-time remediation to promote student success. Topics include: mean, standard deviation, variance, probability, random variables, binomial probability distribution, normal probability distribution, the central limit theorem, hypothesis testing, confidence intervals, t-distribution, chi-square distribution, F-distribution, linear regression, and linear correlation. This course is a beginning statistics course designed for all majors. Not open to students currently enrolled in or with credit in MATH 112 or PSYC 210. Statistical software and a calculator are required.
Transfer Credit: CSU; UC
C-ID: MATH 110

MATH 114 **4.0 UNITS**
College Algebra
Class Hours: 4.0 Lecture
Total Contact Hours: 72 Lecture

Prerequisite: Courses taught at the level of Intermediate Algebra with a grade of "C" or higher or "Pass" or equivalent or appropriate placement based on the college's multiple measures process This course is designed for students majoring in life or social sciences. The main topics to be covered include linear and quadratic equations and inequalities; polynomial, rational, exponential, and logarithmic functions and their graphs; systems of linear equations, matrices, sequences and series; combinatorics; and the binomial theorem.
Transfer Credit: CSU; UC*
*UC: credit limits may apply. MATH 114 and MATH 150 combined: maximum credit, one course.

MATH 115 **4.0 UNITS**
Finite Mathematics
Class Hours: 4.0 Lecture
Total Contact Hours: 72 Lecture

Prerequisite: MATH 80 or MATH 80B or equivalent with a grade of "C" or higher or "Pass" or completion of the math placement process with a score eligible for MATH courses numbered 100 level or higher.
This course includes sets, matrices, systems of equations and inequities, linear programming, permutations and combinations, probability, and topics from statistics. Applications of various topics from business, social, and behavioral sciences are included.
Transfer Credit: CSU; UC
C-ID: MATH 130

MATH 116 **4.0 UNITS**
Calculus for Managerial, Biological and Social Sciences
Class Hours: 4.0 Lecture
Total Contact Hours: 72 Lecture

Prerequisite: Courses taught at the level of Intermediate Algebra with a grade of "C" or higher or "Pass" or equivalent or appropriate placement based on the college's multiple measures process. This course is a survey of calculus designed to meet lower-division university and four-year college requirements for the management, biology, or social-science major student. Topics included are differentiation and integration of algebraic, logarithmic, and exponential functions of single and multi-variables, related rates, areas, and curve sketching. This class is not equivalent to MATH 170 and does not meet the prerequisite for MATH 190. This course is not open to students with credit in MATH 170.
Transfer Credit: CSU; UC*
C-ID: MATH 140
*UC: credit limits may apply. MATH 116 and MATH 170 combined: maximum credit, one course.

MATH 140 **3.0 UNITS**
Trigonometry
Class Hours: 3.0 Lecture
Total Contact Hours: 54 Lecture

Prerequisite: Courses taught at the level of Intermediate Algebra with a grade of "C" or higher or "Pass" or equivalent or appropriate placement based on the college's multiple measures process This course includes circular functions, inverses, graphs, angles and trigonometric functions, solutions of right and oblique triangles, identities, solutions of equations, and complex numbers.
Transfer Credit: CSU

MATH 155 **5.0 UNITS**
Precalculus
Class Hours: 5.0 Lecture
Total Contact Hours: 90 Lecture

Prerequisite: Courses taught at the level of Intermediate Algebra with a grade of "C" or higher or "Pass" or equivalent or appropriate placement based on the college's multiple measures process. This course is designed to prepare students for calculus. It includes an analysis of linear, absolute value, quadratic, polynomial, rational, radical, exponential, logarithmic, and trigonometric functions and their inverses. Additional topics included are the complex number system, systems of equations and inequalities, conics, sequences, series, the binomial theorem, and mathematical induction. A nonsymbolic graphing calculator is required.
Transfer Credit: CSU; UC

MATH 160 **4.0 UNITS**
Discrete Mathematics
Class Hours: 4.0 Lecture
Total Contact Hours: 72 Lecture

Prerequisite: MATH 150 or MATH 155 or equivalent with a grade of "C" or higher or "Pass".
This course is an introduction to logic, sets, relations, algorithms, number theory, combinatorics, graphs, trees, and Boolean algebra.
Transfer Credit: CSU; UC

MATH 170 **4.0 UNITS**
Analytic Geometry and Calculus I
Class Hours: 4.0 Lecture
Total Contact Hours: 72 Lecture

Prerequisite: MATH 155 or equivalent with a grade of "C" or higher or "Pass" or appropriate placement based on the colleges multiple measures process with eligibility for MATH 170.
This course is the first semester of calculus, designed to meet lower-division university and four-year college requirements. Topics included are differentiation and integration of algebraic and transcendental functions with applications. Analytic geometry is presented as needed to address problems encountered in developing the principles of calculus.
Transfer Credit: CSU; UC*
C-ID: MATH 211
*UC: credit limits may apply. MATH 116 and MATH 170 combined: maximum credit, one course.

MATH 190 **4.0 UNITS**
Analytic Geometry and Calculus II
Class Hours: 4.0 Lecture
Total Contact Hours: 72 Lecture

Prerequisite: MATH 170 or equivalent with a grade of "C" or higher or "Pass."
This course is a continuation of MATH 170. Topics include analytic geometry of the plane, techniques of integration with applications, sequences, series, and improper integrals.
Transfer Credit: CSU; UC
C-ID: MATH 221

MATH 225 **5.0 UNITS**
Calculus III
Class Hours: 5.0 Lecture
Total Contact Hours: 90 Lecture

Prerequisite: MATH 190 or equivalent with a grade of "C" or higher or "Pass."
This is the third course in a three-course sequence designed for science, technology, engineering, and mathematics (STEM) majors. Topics include vectors in three-dimensional space, curves and surfaces, functions of several variables, partial differentiation, gradients, curl, divergence, multiple integration, Green's theorem, the divergence theorem, and Stokes' theorem. A nonsymbolic graphing calculator is required.
Transfer Credit: CSU; UC
C-ID: MATH 230

MATH 250 **5.0 UNITS**
Linear Algebra and Differential Equations
Class Hours: 5.0 Lecture
Total Contact Hours: 90 Lecture

Prerequisite: MATH 190 or equivalent with a grade of "C" or higher or "Pass."
Recommendation: MATH 220 or MATH 225 or equivalent with a grade of "C" or higher or "Pass.".
Topics in this course include first-order ordinary differential equations, including separable, linear, homogeneous of degree zero, Bernoulli, and exact with applications and numerical methods; solutions to higher-order differential equations using undetermined coefficients, variation of parameters, and power series, with applications; solutions to linear and nonlinear systems of differential equations, including numerical solutions; matrix algebra, solutions of linear systems of equations, and determinants; vector spaces, including the Gram-Schmidt procedure; and linear transformations, kernel and range, eigenvalues, eigenvectors, diagonalization, and symmetric matrices.
Transfer Credit: CSU; UC
C-ID: MATH 910S

MATH 298 **1.0 UNITS**
Directed Studies
A course to provide opportunity for individual research and field projects under the direction of a faculty member in a given department. With the guidance of the faculty member, students prepare and carry out a written learning agreement describing the purposes and outcomes of the project. Students should expect to meet with the supervising faculty member one to two hours each week for conferences. Credit is based upon the number of hours in the semester expected to complete the project (1 unit for 54 hours). This course may be taken a maximum of 2 times. For selected disciplines, UC transfer credit may be possible after admission to a UC campus, pending review of appropriate course materials by UC staff. See a counselor for an explanation.
Transfer Credit: CSU

MATH 299 **2.0 UNITS**
Directed Studies
A course to provide opportunity for individual research and field projects under the direction of a faculty member in a given department. With the guidance of the faculty member, students prepare and carry out a written learning agreement describing the purposes and outcomes of the project. Students should expect to meet with the supervising faculty member one to two hours each week for conferences. Credit is based upon the number of hours in the semester expected to complete the project (2 units for 108 hours). This course may be taken a maximum of 2 times. For selected disciplines, UC transfer credit may be possible after admission to a UC campus, pending review of appropriate course materials by UC staff. See a counselor for an explanation.
Transfer Credit: CSU