MATHEMATICS (MATH)

MATH N01 C Supervised Tutoring - Math **0 Units**
NON-CREDIT COURSE Term hours: 4-48 laboratory. This course provides individual tutoring based on each student's needs in mathematics. Students wishing to use the Math Learning Center must enroll in this course.

MATH 009 C Skills for Math for Elem Tchrs **2 Units**
Prerequisite(s): Appropriate placement.
Corequisite(s): MATH 110PC Term hours: 36 lecture.
This support course covers the skills and concepts needed to be successful in MATH 110PC. Topics include operations with integers, multiplying polynomials, factoring polynomials, solving linear equations, graphing linear equations, functions, probability, data analysis, and geometric concepts. Students enrolling in a section of MATH 009 C must also enroll in the specific MATH 110PC course it is paired with during the same semester. Pass/No Pass only.

MATH 011 C Skills for Finite Math **2 Units**
Prerequisite(s): Appropriate placement.
Corequisite(s): MATH 115PC Term Hours: 36 lecture.
This support course covers the skills and concepts needed to be successful in MATH 115PC. Topics include multiplying polynomials, factoring polynomials, solving linear equations, graphing linear equations, functions, and graphing inequalities. Students enrolling in a section of MATH 011 C must also enroll in the specific MATH 115PC course it is paired with during the same semester. Pass/No Pass only.

MATH 012 C Skills for Probability Stats **2 Units**
Prerequisite(s): Appropriate placement.
Corequisite(s): MATH 120PC Term Hours: 36 lecture.
This support course covers the skills and concepts needed to be successful in MATH 120PC which includes solving and graphing linear equations, order of operations of real numbers, basic probability, probability distributions, measures of central tendency and dispersion, sampling techniques, parametric and non-parametric tests of hypotheses, point and interval estimation, linear regression and correlation. Students will use computer software and/or graphing calculators for statistical analysis of various topics. This course requires the use of a graphing calculator comparable to the TI-83/84. Students enrolling in a section of MATH 012 C must also enroll in the specific MATH 120PC course it is paired with during the same semester. Pass/No Pass only.

MATH 013 C Skills for Survey of Calculus **2 Units**
Prerequisite(s): Appropriate placement.
Corequisite(s): MATH 130PC Term Hours: 36 lecture.
This support course covers the skills and concepts necessary for success in MATH 130PC. Concurrent enrollment in MATH 130PC is required. Topics include factoring polynomials, solving linear, quadratic, polynomial, and exponential equations, graphing lines and parabolas, laws of exponents and logarithms, functions, solving systems of linear equations, and common geometric formulas. Students enrolling in a section of MATH 013 C must also enroll in the specific MATH 130PC course it is paired with during the same semester. Pass/No Pass only.

MATH 014 C Skills for College Algebra **2 Units**
Prerequisite(s): Appropriate placement.
Corequisite(s): MATH 141PC Term Hours: 36 lecture.
This support course covers the skills and concepts needed to be successful in MATH 141PC. Topics include factoring polynomials, solving linear, quadratic, polynomial, exponential, and logarithmic equations, graphing lines, parabolas, and other nonlinear functions, the laws of exponents, functions, solving systems of linear and nonlinear equations, common geometric formulas, and other fundamentals of Algebra. Students enrolling in a section of MATH 014 C must also enroll in the specific MATH 141PC course it is paired with during the same semester. Pass/No Pass only.

MATH 050 C Skills for Calculus I **2 Units**
Prerequisite(s): Appropriate placement Corequisite: Concurrent enrollment in MATH 150PC.
Advisory: Highly recommended for students who are seeking increased support for success in Calculus I.
Also recommended for students who completed Math 141PC. Term Hours: 36 lecture. This support course covers the skills and concepts needed to be successful in MATH 150PC. Topics include simplifying, factoring, functions, properties of exponents and logarithms, trigonometric identities, graphs, and angle values, and additional concepts from algebra and geometry. Students enrolling in a section of MATH 050 C must also enroll in the specific MATH 150PC course it is paired with during the same semester. Pass/No Pass only.

MATH 098 C Mathematics Seminar **0.5-4 Units**
Term hours: 9-72 lecture depending on units attempted. This course is a lecture/discussion approach to special topics involving mathematics. It may be a problem session relating to a particular course in the curriculum or a study of topics not ordinarily covered in the curriculum. Consult the class schedule to verify unit credit for a particular semester. Fees may be required-payable at registration. Pass/No Pass or Letter Grade option.

MATH 100 C Liberal Arts Mathematics **3 Units**
Prerequisite(s): Geometry and Intermediate Algebra, or their equivalents, with grades of C or better, or by the evaluation of the college's multiple measures placement process.
Term hours: 54 lecture. This is a survey course with selected topics from the history and development of mathematics, elementary logic and set theory, probability, statistics, geometry, and exponential and logarithmic applications. This course is designed for prospective teachers and liberal arts students. (UC/CSU, AA GE, CSU GE, IGETC)

MATH 110 C Math for Prospective Teachers **4 Units**
Prerequisite(s): Geometry and Intermediate Algebra, or their equivalents, with grades of C or better, or by the evaluation of the college's multiple measures placement process.
Advisory: Through the multiple measures' evaluation process, students may be required to take MATH 110PC with the paired support course MATH 009 C.
All students may take MATH 110PC with the support course MATH 009 C. Term hours: 72 lecture. This course is an introduction to problem solving processes and strategies. Students explore the development and analysis of the structure and operations of the real number system. Students focus on concept and process development using appropriate models, manipulatives, and activities. This course is designed for prospective elementary and middle school teachers. This course requires the use of a non-graphing scientific calculator. (UC/CSU, AA GE, CSU GE, C-ID:MATH 120)

MATH 110PC Math for Prospective Teachers **4 Units**

Prerequisite(s): Geometry and Intermediate Algebra, or their equivalents, with grades of C or better, or by the evaluation of the college's multiple measures placement process.

Corequisite(s): MATH 009 C Advisory: Through the multiple measures' evaluation process, students may be required to take MATH 110PC with the paired support course MATH 009 C.

All students may take MATH 110PC with the support course MATH 009 C. Term hours: 72 lecture. This course is an introduction to problem solving processes and strategies. Students explore the development and analysis of the structure and operations of the real number system. Students focus on concept and process development using appropriate models, manipulatives, and activities. This course is designed for prospective elementary and middle school teachers. This course requires the use of a non-graphing scientific calculator. This course contains the same topics as MATH 110 C, but it must be taken concurrently with a paired section of the corequisite MATH 009 C. Duplicate credit not granted for MATH 110 C.(UC/CSU, CSU GE, AA GE)

MATH 115 C Finite Mathematics **4 Units**

Prerequisite(s): Intermediate Algebra, or their equivalents, with grades of C or better, or by the evaluation of the college's multiple measures placement process.

Advisory: Through the multiple measures' evaluation process, students may be required to take MATH 115PC with the paired support course MATH 011C.

All students may take MATH 115PC with the support course MATH 011C. Term hours: 72 lecture. This is a general education course in practical mathematics for liberal arts students or any student not majoring in mathematics or science. This course covers linear equations, functions, finance, matrices, linear systems, linear programming, sets, counting techniques, probability, and applications to various fields such as business, economics, life sciences, and social sciences. This course requires the use of a TI-83/84 or equivalent graphing calculator. (CSU/UC/AA GE, CSU GE, IGETC/C-ID: MATH 130)

MATH 115PC Finite Mathematics **4 Units**

Prerequisite(s): Intermediate Algebra, or their equivalents, with grades of C or better, or by the evaluation of the college's multiple measures placement process.

Advisory: Through the multiple measures' evaluation process, students may be required to take MATH 115PC with the paired support course MATH 011 C.

All students may take MATH 115PC with the support course MATH 011 C. Term hours: 72 lecture. This is a general education course in practical mathematics for liberal arts students or any student not majoring in mathematics or science. This course covers linear equations, functions, finance, matrices, linear systems, linear programming, sets, counting techniques, probability, and applications to various fields such as business, economics, life sciences, and social sciences. This course requires the use of a TI-83/84 or equivalent graphing calculator. (UC/CSU, AA GE, CSU GE, IGETC, C-ID:MATH 130)

MATH 120 C Intro Probability Statistics **4 Units**

Prerequisite(s): Pre-Statistics or Intermediate Algebra, or their equivalents, with grades of C or better, or by the evaluation of the college's multiple measures placement process.

Advisory: Through the multiple measures' evaluation process, students may be required to take MATH 120PC with the paired support course MATH 012 C.

All students may take MATH 120PC with the support course MATH 012C. Term hours: 72 lecture. This course is an introduction to the elements of statistical analysis which includes an intuitive approach to the study of probability and probability distributions, measures of central tendency and dispersion, sampling techniques, parametric and non-parametric tests of hypotheses, point and interval estimation, linear regression and correlation. Applications to business, biological sciences, health sciences, and social sciences are emphasized. Students will use computer software and/or graphing calculators for statistical analysis of various topics. This course requires the use of a graphing calculator comparable to the TI-83/84. Students who receive credit for this course may not receive credit for MATH 120PC. Duplicate credit not granted for MATH 120HCPSY 161 C, PSY 161HC, SOC 161 C, or SOC 161HC. (UC Credit Limitation/CSU, AA GE, CSU GE, IGETC, C-ID: MATH 110 and SOCI 125).

MATH 120PC Intro to Probability and Stats **4 Units**

Prerequisite(s): Pre-Statistics or Intermediate Algebra, or their equivalents, with grades of C or better, or by the evaluation of the college's multiple measures placement process.

Corequisite(s): MATH 012 C.

Advisory: Through the multiple measures' evaluation process, students may be required to take MATH 120PC with the paired support course MATH 012 C.

All students may take MATH 120PC with the support course MATH 012 C. Term hours: 72 lecture. This course is an introduction to the elements of statistical analysis which includes an intuitive approach to the study of probability and probability distributions, measures of central tendency and dispersion, sampling techniques, parametric and non-parametric tests of hypotheses, point and interval estimation, linear regression and correlation. Applications to business, biological sciences, health sciences, and social sciences are emphasized. Students will use computer software and/or graphing calculators for statistical analysis of various topics. This course requires the use of a graphing calculator comparable to the TI-83/84. This course contains the same topics as MATH 120 C, but it must be taken concurrently with a paired section of the corequisite MATH 012 C. Duplicate credit not granted for MATH 120 C or MATH 120HC.(UC/CSU, AA GE, CSU GE, IGETC, C-ID: MATH 110)

MATH 126 C Intro. to Prob. & Stat w/ Tech **4 Units**

Prerequisite(s): Pre-Statistics or Intermediate Algebra, or their equivalents, with grades of C or better, or by the evaluation of the college's multiple measures placement process.

Proof of prerequisites is required. Term hours: 72 lecture. This course is an introduction to the elements of statistical analysis which includes an intuitive approach to the study of probability and probability distributions, measures of central tendency and dispersion, sampling techniques, parametric tests of hypotheses, point and interval estimation, linear regression and correlation. Applications to business, biological sciences, health sciences, and social sciences are emphasized. Students will use computer software and/or graphing calculators for statistical analysis of various topics. This course requires the use of the software R and RStudio. Duplicate credit not granted for MATH 120C, MATH 120PC, or MATH 120HC. (CSU, AA GE, CSU GE, C-ID: MATH 110).

MATH 130 C Survey of Calculus **4 Units**

Prerequisite(s): Intermediate Algebra, or their equivalents, with grades of C or better, or by the evaluation of the college's multiple measures placement process.

Advisory: Through the multiple measures' evaluation process, students may be required to take MATH 130PC with the paired support course MATH 013C.

All students may take MATH 130PC with the support course MATH 013C. Term hours: 72 lecture. This course is an introduction to calculus with an emphasis on solution techniques and applications rather than abstract theory. It includes elements of analytic geometry, limits, derivatives, integration as a summation process, exponential and logarithmic functions, integration of basic forms, techniques of integration, an introduction to multi-variable calculus, and curve sketching, with applications from the life sciences, engineering technology, economics, and the social sciences. This course requires the use of a graphing calculator comparable to the TI-83/TI-84. (UC Credit Limitation/CSU, AA GE, CSU GE, IGETC, C-ID:MATH 140)

MATH 130PC Survey of Calculus **4 Units**

Prerequisite(s): Intermediate Algebra, or their equivalents, with grades of C or better, or by the evaluation of the college's multiple measures placement process.

Corequisite(s): MATH 013 C Advisory: Through the multiple measures' evaluation process, students may be required to take MATH 130PC with the paired support course MATH 013C.

All students may take MATH 130PC with the support course MATH 013C. Term hours: 72 lecture. This course is an introduction to calculus with an emphasis on solution techniques and applications rather than abstract theory. It includes elements of analytic geometry, limits, derivatives, integration as a summation process, exponential and logarithmic functions, integration of basic forms, techniques of integration, an introduction to multi-variable calculus, and curve sketching, with applications from the life sciences, engineering technology, economics, and the social sciences. This course requires the use of a graphing calculator comparable to the TI-83/TI-84. This course contains the same topics as MATH 130 C, but it must be taken concurrently with a paired section of the corequisite MATH 013 C. Duplicate credit not granted for MATH 130 C. (UC/CSU, AA GE, CSU GE, IGETC).

MATH 141 C College Algebra **4 Units**

Prerequisite(s): Geometry and Intermediate Algebra, or their equivalents, with a grade of C or better, or by the evaluation of the college's multiple measures placement process.

Advisory: Through the multiple measures' evaluation process, students may be required to take MATH 141PC with the paired support course MATH 014C.

All students may take MATH141PC with the support course MATH 014C. Term hours: 72 lecture. This is one of two courses to prepare students for the calculus sequence. The topics covered include a review of the fundamentals of algebra; rational, exponential and logarithmic functions; theory of equations and zeros of polynomial functions; systems of equations including linear and quadratic systems; sequences and series; permutations; combinations; binomial theorem; analytic geometry; conic sections; and miscellaneous topics. (UC/CSU, AA GE, CSU GE, IGETC, C-ID: MATH 151)

MATH 141PC College Algebra **4 Units**

Prerequisite(s): Geometry and Intermediate Algebra, or their equivalents, with a grade of C or better, or by the evaluation of the college's multiple measures placement process.

Corequisite(s): MATH 014 C Advisory: Through the multiple measures' evaluation process, students may be required to take MATH 141PC with the paired support course MATH 014C.

All students may take MATH141PC with the support course MATH 014C. Term hours: 72 lecture. This is one of two courses to prepare students for the calculus sequence. The topics covered include a review of the fundamentals of algebra; rational, exponential and logarithmic functions; theory of equations and zeros of polynomial functions; systems of equations including linear and quadratic systems; sequences and series; mathematical induction; permutations; combinations; binomial theorem; analytic geometry; conic sections; and miscellaneous topics. This course contains the same topics as MATH 141 C, but it must be taken concurrently with a paired section of the corequisite MATH 014 C. Duplicate credit not granted for MATH 141 C. (UC/CSU, AA GE, CSU GE, IGETC)

MATH 142 C Trigonometry **4 Units**

Prerequisite(s): MATH 141 C or MATH 141PC with a grade of C or better and the assessment process.

Term hours: 72 lecture. This is a one-semester course in trigonometry designed to prepare students for the study of calculus. The topics to be covered include the following: measurements of angles, trigonometric and inverses trigonometric functions and their graphs, solving trigonometric equations, verifying trigonometric identities, solutions of triangles, complex numbers, polar coordinates, vectors, DeMoivre's Theorem, and parametric equations. (CSU, AA GE, CSU GE)

MATH 150AC Calculus I **4 Units**

Prerequisite(s): Both MATH 141 C and MATH 142 C, or both MATH 141PC and MATH 142 C all with a grade of C or better and the assessment process.

Proof of prerequisites is required. Term hours: 72 lecture. This course is an introduction to mathematical analysis. It includes the study of analytic geometry, functions and limits, continuity, differentiation and integration. Problem work includes applications involving derivatives, definite integrals and indefinite integrals. (UC Credit Limitation/CSU, AA GE, CSU GE, IGETC, C-ID: MATH 210 and MATH 900S= MATH 150AC + MATH 150BC)

MATH 150BC Calculus II **4 Units**

Prerequisite(s): MATH 150AC with a grade of C or better or comparable Calculus I and Analytic Geometry and the assessment process. Proof of prerequisites is required.

Proof of prerequisites is required. Term hours: 72 lecture. This course is a continuation of MATH 150AC. It includes the study of applications of integration, techniques of integration, improper integrals, sequences, infinite series, power series, Taylor and Maclaurin series, conic sections, parametric equations, polar curves, and a brief introduction to differential equations. (UC/CSU, AA GE, IGETC, CSU GE, C-ID: MATH 221 and MATH 900S = MATH 150AC + MATH 150BC))

MATH 150PC Calculus I **4 Units**

Prerequisite(s): Both MATH 141 C and MATH 142 C, or both MATH 141PC and MATH 142 C all with a grade of C or better and the assessment process.

Corequisite(s): Concurrent enrollment in MATH 050 C.

Proof of prerequisites is required. Term hours: 72 lecture. This course is an introduction to mathematical analysis. It includes the study of analytic geometry, functions and limits, continuity, differentiation and integration. Problem work includes applications involving derivatives, definite integrals, and indefinite integrals. (CSU/UC, AA GE, CSU GE)

MATH 220 C Intro. to Data Science with R **4 Units**

Prerequisite(s): MATH 141 C or MATH 141 PC or MATH 120 C or MATH 120 PC or MATH 126 C, or their equivalents, with a grade of C or better, or by the evaluation of the college's multiple measures placement process.

Proof of prerequisites is required. Note: Students majoring in Engineering, Science or Math should be taking MATH 141 C or MATH 141PC rather than MATH 120 C or MATH 120PC or MATH 126 C. This course is an introduction to foundations of data science. Topics include data collection, data wrangling, exploratory analysis and visualization, introduction to statistical modeling, prediction and classification, and model outcome interpretations. Applications include real data from a wide range of fields following reproducible practice. Students will use computer software for statistical analysis of various topics. This course requires the use of the software R and Rstudio. (CSU, AA GE)

MATH 250AC Multivariable Calculus **4 Units**

Prerequisite(s): MATH 150BC or Calculus II and Analytic Geometry with a grade of C or better and the assessment process.

Proof of prerequisites is required. Term hours: 72 lecture. This is an intermediate course in mathematical analysis. It includes the study of three-dimensional analytic geometry, calculus of functions of several variables, vector calculus, multiple integration, vector fields and theorems, with associated problem applications. (UC/CSU, AA GE, CSU GE, IGETC, C-ID: MATH 230)

MATH 250BC Linear Algebra and Differential Equations **5 Units**

Prerequisite(s): MATH 250AC or Calculus III and Analytic Geometry with a grade of C or better and the assessment process.

Term hours: 90 lecture. This course is an introduction to linear algebra and ordinary differential equations. Linear algebra includes matrix algebra, solutions of linear systems of equations, augmented matrices with Gauss-Jordan elimination, inverse matrices, determinants, vector spaces, linear independence, basis, dimension, subspace, row space, column space, null space, inner product space, the Gram-Schmidt procedure, linear transformations (proofs, kernel and range), eigenvalues, eigenvectors, diagonalization and orthogonal diagonalization of symmetric matrices. Differential equations includes applications and solutions to first-order differential equations (separable, linear, homogeneous, Bernoulli, and exact), higher order differential equations (reducible to first order, Cauchy-Euler, undetermined coefficients, variation of parameters, power series, and the Laplace Transform), and systems of linear differential equations (fundamental solutions, variation of parameters, and solutions by eigenvalues and eigenvectors). (UC/CSU, AA GE, IGETC, CSU GE, C-ID: MATH 240, MATH 250, MATH 910S)

MATH 299 C Mathematics Independent Study **0.5-2 Units**

Prerequisite(s): Approved Independent Study Learning Contract

Term hours: 9-36 lecture depending on units attempted. This course is for students who have demonstrated interest in and capability for increased knowledge of mathematical topics not ordinarily covered in curriculum courses. Students will participate in independent study or research on assigned projects under staff supervision. (UC Credit Limitation/CSU)