MATHEMATICS

MATHEMATICS (MATH)

DIVISION: Mathematics

MATH 003 COLLEGE ALGEBRA FOR STEM
5 unit
Transfer Credit: CSU; UC limitations. See counselor.
C-ID: MATH 151
Prerequisite(s): *Intermediate Algebra or placement into any Math course numbered 001-099*

Algebra, graphing, and applications of functions; polynomial, rational, logarithmic and exponential functions, equations and inequalities; linear and nonlinear systems of equations; conic sections; sequences and series; the binomial theorem. Intended for STEM majors but open to all qualified students. Total of 90 hours lecture.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*

MATH 005A SINGLE VARIABLE CALCULUS I
5 unit
Transfer Credit: CSU; UC credit limitations. See counselor.
C-ID: MATH 211; MATH SEQ 900S (WITH MATH 005B)
Prerequisite(s): *MATH 008 or MATH 009, or placement based on the Math assessment process*

Limits, differentiation, and integration of functions of a single variable including the Mean Value Theorem and the Fundamental Theorem of Calculus. No credit if taken after MATH 005AH. Total of 90 hours lecture.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*

MATH 005AH HONORS SINGLE VARIABLE CALCULUS I
5 unit
Transfer Credit: CSU; UC
Prerequisite(s): *MATH 008 or MATH 009, or placement based on the Math assessment process*

Enrollment Limitation: *Acceptance into the Honors Program*

Limits, differentiation, and integration of functions of a single variable including the Mean Value Theorem and the Fundamental Theorem of Calculus. As an honors course, students will be expected to complete additional assignments involving more extensive proofs and problem solving to gain deeper insight into single variable calculus theory and applications. No credit if taken after MATH 005A. Total of 90 hours lecture.
Grade Mode: *Letter Grade, Pass/No-Pass*

MATH 005B SINGLE VARIABLE CALCULUS II
5 unit
Transfer Credit: CSU; UC
C-ID: MATH 221; MATH SEQ 900S (WITH MATH 005A)
Prerequisite(s): *MATH 005A or MATH 005AH*

Differentiation and integration of trigonometric, exponential, logarithmic, hyperbolic functions, polar, and parametric equations; applications and techniques of integration; indeterminate forms and infinite sequences and series. No credit given if taken after MATH 005BH. Total of 90 hours lecture.
Grade Mode: *Letter Grade, Pass/No-Pass*

MATH 005BH HONORS SINGLE VARIABLE CALCULUS II
5 unit
Transfer Credit: CSU; UC
C-ID: MATH 221
Prerequisite(s): *MATH 005A or 005AH*

Enrollment Limitation: *Acceptance to the PCC Honors program*

Differentiation and integration of trigonometric, exponential, logarithmic, hyperbolic functions; polar, and parametric equations; applications and techniques of integration; indeterminate forms and infinite sequences and series. As an honors course, students will be expected to complete additional assignments involving more extensive proofs and problem solving to gain deeper insight of single variable calculus theory and applications. No credit if taken after MATH 005B. Total of 90 hours lecture.
Grade Mode: *Letter Grade, Pass/No-Pass*

MATH 005C MULTIVARIABLE CALCULUS
5 unit
Transfer Credit: CSU; UC
C-ID: MATH 230
Prerequisite(s): *MATH 005B or MATH 005BH*

Parametric equations, polar coordinates, vectors and vector calculus, partial differentiation, multiple integration, Green's theorem, divergence theorem of Gauss, Stokes' theorem. No credit given if taken after MATH 005CH. Total of 90 hours lecture
Grade Mode: *Letter Grade, Pass/No-Pass*

MATH 005CH HONORS MULTIVARIABLE CALCULUS
5 unit
Transfer Credit: CSU; UC
Prerequisite(s): *MATH 005B or 005BH*

Enrollment Limitation: *Acceptance to the PCC Honors program*

Parametric equations, polar coordinates, vectors and vector calculus, partial differentiation, multiple integration, Green's theorem, divergence theorem of Gauss, Stokes' theorem. As an honors course, students will be expected to complete additional assignments involving more extensive proofs and problem solving to gain deeper insight of multivariable calculus theory and applications. No credit if taken after MATH 005C. Total of 90 hours lecture.
Grade Mode: *Letter Grade, Pass/No-Pass*

MATH 006A CALCULUS FOR LIFE SCIENCES I
3 unit
Transfer Credit: CSU; UC
Prerequisite(s): *MATH 003 or MATH 009 or placement by the Math Placement process*

Standard topics in differential calculus with an emphasis on life science applications used throughout the course. Topics include algebraic, trigonometric, exponential growth and decay functions; limits; continuity; derivatives and applications of derivatives; brief introduction to integrals. Total of 54 hours lecture.
Grade Mode: *Letter Grade, Pass/No-Pass*

MATH 008 PRECALCULUS TRIGONOMETRY
4 unit
Transfer Credit: CSU
Prerequisite(s): *MATH 003 or placement based on the assessment process*

Trigonometric functions and their graphs; inverse trigonometric functions; unit circle and special right triangles; trigonometric identities and equations; polar and parametric equations; polar and rectangular forms of complex numbers and vectors; matrix algebra and Cramer's Rule; mathematical induction. Intended for STEM majors but open to all qualified students. No credit if taken after MATH 007B. Total of 72 hours lecture.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*

MATH 009 PRECALCULUS MATHEMATICS
6 unit
Transfer Credit: CSU; UC credit limitations. See counselor.
Prerequisite(s): *Intermediate Algebra or placement into any Math class numbered 001-099*

Algebraic, exponential, logarithmic and trigonometric functions; inverse functions; zeros and graphs of functions; inequalities; matrices; determinants; sequences and series; binomial theorem; mathematical induction; topics in analytic geometry including curve sketching and conic sections. No credit if taken after MATH 003 and MATH 008. Intended to prepare students for success in Calculus. Total of 108 hours lecture.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*

MATH 010 LINEAR ALGEBRA AND APPLICATIONS
4 unit
Transfer Credit: CSU; UC
C-ID: MATH 250
Prerequisite(s): *MATH 005B or 005BH*

Vector spaces, linear transformations, determinants, eigenvalues, eigenvectors, solutions of systems of equations, algebra of matrices, inner product spaces, the Gauss-Jordan algorithm, and the Gram-Schmidt algorithm. No credit if taken after MATH 010H. Total of 72 hours lecture.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*

MATH 010H HONORS LINEAR ALGEBRA AND APPLICATIONS
4 unit
Transfer Credit: CSU; UC
Prerequisite(s): *MATH 005B or 005BH*

Enrollment Limitation: *Acceptance to the Honors Program*

Vector spaces, linear transformations, determinants, eigenvalues, eigenvectors, solutions of systems of equations, algebra of matrices, inner product spaces, the Gauss-Jordan algorithm, and the Gram-Schmidt algorithm. As an honors course, students will be expected to complete additional assignments involving advanced topics, applications, more extensive proofs, or a research project/poster presentation on an approved topic or application related to Linear Algebra. No credit if taken after MATH 010. Total of 72 hours lecture.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*

MATH 015 EXPLORATIONS IN QUANTITATIVE REASONING
4 unit
Transfer Credit: CSU; UC
Prerequisite(s): *Intermediate Algebra or placement into any MATH course numbered 001 - 099*

Skills and techniques for problem solving using mathematical methods and quantitative reasoning. Topics include: elementary logic; combinatorics and probability; statistics; set theory; and finance math. For students with non-STEM majors. Total of 72 hours lecture.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*

MATH 020 INDEPENDENT STUDY
1 unit
Transfer Credit: CSU
Faculty-guided survey of contemporary mathematical topics and student research. Enrollment in Independent Study requires the approval of the division dean. Total of 54 hours laboratory.
Grade Mode: *Letter Grade, Pass/No-Pass*

MATH 022 DISCRETE MATHEMATICS
4 unit
Transfer Credit: CSU, UC
Prerequisite(s): *MATH 005A or CS 002 or placement based on the Math assessment process*

Study of finite mathematical systems. Includes set theory, logic, modular arithmetic, combinatorics, relations and functions, matrix algebra, Boolean algebra, recursion, graph theory. For mathematics and computer science majors, but open to all qualified students. Total of 72 hours lecture.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*

MATH 038 FOUNDATIONS OF ELEMENTARY SCHOOL MATHEMATICS: BASIC NUMBER CONCEPTS
3 unit
Transfer Credit: CSU; UC
Prerequisite(s): *Intermediate Algebra or placement into any MATH course numbered 001 - 099*

Introduces problem-solving strategies and quantitative reasoning to develop skills and explore topics in numeration systems and the real number system. Designed for prospective elementary and middle school teachers. Total of 54 hours lecture and 18 hours laboratory.
Grade Mode: *Letter Grade, Pass/No-Pass*

MATH 055 DIFFERENTIAL EQUATIONS
4 unit
Transfer Credit: CSU; UC
C-ID: MATH 240
Prerequisite(s): *MATH 005B or MATH 005BH*

Ordinary first-and higher-order differential equations and modeling with applications to biological and physical sciences. Linear and nonlinear equations, initial-value problems, series solutions, Laplace transforms, systems of linear equations, and numerical solutions. No credit if taken after MATH 055H. Total of 72 hours lecture.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*

MATH 055H HONORS DIFFERENTIAL EQUATIONS
4 unit
Transfer Credit: CSU; UC
C-ID: MATH 240
Prerequisite(s): *MATH 005B or MATH 005BH*

Enrollment Limitation: *Acceptance to the Honors program*

Ordinary first- and higher-order differential equations and modeling with applications to biological and physical sciences. Linear and nonlinear equations, initial-value problems, series solutions, Laplace transforms, systems of linear equations, and numerical solutions. As an honors course, students will be expected to complete additional assignments involving more extensive proofs and problem solving to gain deeper insight into differential equations theory and applications. No credit if taken after MATH 055. Total of 72 hours lecture.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*

MATH 065 SCIENTIFIC AND MATHEMATICAL PROGRAMMING
3 unit
Transfer Credit: CSU; UC
Prerequisite(s): *MATH 005A or MATH 005AH*

Application of computation technology to mathematical and scientific problems of modeling, simulations, and visualizations. Hands-on use of a variety of computational methods with high-level programming languages (such as Python or MATLAB). Teaches programming design, tools, and practical coding skills for further mathematical and scientific investigations. Total of 36 hours of lecture and 54 hours of laboratory.
Grade Mode: *Letter Grade, Pass/No-Pass*

MATH 103 SUPPORT FOR COLLEGE ALGEBRA
0.5 unit
Corequisite(s): *MATH 003*

Review of core prerequisite skills, competencies, and concepts for college algebra with an emphasis on critical thinking and problem solving. Intended for students who are concurrently enrolled in MATH 003: College Algebra for STEM. Topics include learning strategies and mathematical knowledge necessary for successful completion of College Algebra for STEM. Total of 45 hours laboratory.
Grade Mode: *Pass/No-Pass*

MATH 105A SUPPORT FOR SINGLE VARIABLE CALCULUS I
0.5 unit
Overview of core mathematical skills, competencies, and concepts for first-semester calculus, such as algebraic manipulation and simplification, the unit circle and trigonometric relationships, and characteristics of functions, with an emphasis on critical thinking and problem solving. Course content includes precalculus and geometry topics necessary for successful completion of first-semester calculus. Intended for students who are concurrently enrolled in first semester calculus, but open to all students. Total of 45 hours laboratory.
Grade Mode: *Pass/No-Pass*

MATH 105B SUPPORT FOR SINGLE VARIABLE CALCULUS II
0.5 unit
Overview of core mathematical skills, competencies, and concepts for second-semester calculus, such an inverse functions, exponential and logarithmic functions, and trigonometric topics, with an emphasis on critical thinking and problem solving. Course content includes precalculus topics and first-semester calculus review necessary for successful completion of second-semester calculus. Intended for students who are concurrently enrolled in second-semester calculus, but open to all students. Total of 45 hours laboratory.
Grade Mode: *Pass/No-Pass*

MATH 115 SUPPORT FOR EXPLORATIONS IN QUANTITATIVE REASONING
0.5 unit
Corequisite(s): *MATH 015*

Review of core prerequisite skills, competencies, and concepts for quantitative reasoning with an emphasis on critical thinking and problem solving. Intended for students who are concurrently enrolled in MATH 015: Explorations in Quantitative Reasoning. Topics include learning strategies and mathematical knowledge necessary for successful completion of Explorations in Quantitative Reasoning. Total of 36 hours laboratory.
Grade Mode: *Pass/No-Pass*

MATH 125 BEGINNING ALGEBRA
4 unit
Prerequisite(s): *MATH 402 or 400B or 250, or placement based on the Math assessment process*

Simplifying linear, polynomial, rational, and radical expressions. Using properties of exponents. Factoring polynomials. Applications and solving of linear, rational, radical, and quadratic equations. Graphing linear equations and solving systems of linear equations. Maximum credit for MATH 125, 127AB, and 128AB is 4 units. No credit if taken after MATH 127B or MATH 128B. Total of 90 hours lecture.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*

MATH 131 INTERMEDIATE ALGEBRA FOR STEM
5.5 unit
Prerequisite(s): *MATH 125; or MATH 250 and concurrent enrollment in or completion of MATH 331; or placement based on the Math assessment process*

Topics include algebra, graphing, and applications of functions: polynomial, rational, radical, exponential, and logarithmic. Designed for STEM majors and some Business majors. Total of 90 hours lecture and 45 hours laboratory.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*

MATH 150 QUANTITATIVE LITERACY II
5.5 unit
Prerequisite(s): *MATH 250 or MATH 402 or MATH 400B or placement based on the Math assessment process*

Study of practical applications of mathematics including finance, probability, statistics, geometry, measurement & dimensional analysis, and functions: linear, exponential & logarithmic. For non-STEM majors, but open to all qualified students. Total of 90 hours lecture and 45 hours of laboratory.
Grade Mode: *Audit, Letter Grade, Pass/No-Pass*