MATHEMATICS

The mathematics program provides strong emphasis on fundamental concepts and problem solving skills useful in a myriad of career paths. The study of both pure mathematics and applied mathematics provide skills useful in fields such as Actuarial Science, Astronomy, Biology, Chemistry, Computer Science, Digital Arts, Earth Sciences, Economics, Education, Engineering, Physical Sciences, Physics, the Social Sciences.

Assembly Bill 705 allows students to enroll directly into a transfer-level math course. Research shows that enrolling directly into a transfer-level math course connected to students' educational goals is the most likely pathway to success. First-level transferable math courses are MATH V04 College Algebra (Units: 4), MATH V38 Mathematics for Elementary School Teachers (Units: 3), MATH V40 Exploration of Mathematical Ideas (Units: 3), and MATH V44 Elementary Statistics (Units: 4). Please consult with an academic counselor to ensure placement into the proper transfer-level math course.

Credit Courses

MATH V01 Elementary Algebra 5 Units
In-Class Hours: 87.5 lecture
Prerequisites: MATH V10 or placement as measured by the college's multiple measures assessment process
This course covers number sets, operations with signed numbers, linear equations, graphing, ratio, proportion and variation, linear inequalities, introduction to functions, factoring, rational expressions and equations, exponents, factorable quadratic equations, and systems of equations.
Grade Modes: Letter Graded
Degree Applicability: Applies to Associate Degree
AA/AS GE: None
Transfer Credit: None

MATH V02 Geometry 3 Units
Formerly: MATH 2
In-Class Hours: 52.5 lecture
This course covers sets, real numbers, lines and planes, triangles, congruence, proof, geometric inequalities, parallel and perpendicular lines and planes, polygons, similarity, circles, locus, construction, area, perimeter, and volume.
Grade Modes: Letter Graded
Degree Applicability: Applies to Associate Degree
AA/AS GE: None
Transfer Credit: None

MATH V03 Intermediate Algebra 5 Units
Formerly: Math 3
In-Class Hours: 87.5 lecture
Prerequisites: MATH V01 or placement as determined by the college's multiple measures assessment process
This course covers equations and inequalities, systems of equations using matrices, exponents and radicals, complex numbers, functions and graphs, quadratic equations, conic sections, and exponential and logarithmic functions. Students receiving credit in MATH V03 will not receive credit in MATH V35. Successful completion of this course fulfills the mathematics competency requirement for the AA/AS degree.
Grade Modes: Letter Graded
Degree Applicability: Applies to Associate Degree
AA/AS GE: D2
Transfer Credit: None

MATH V04 College Algebra 4 Units
Formerly: Math 4
In-Class Hours: 70 lecture
Prerequisites: MATH V03 or placement as determined by the college's multiple measures assessment process
C-ID: MATH 150, MATH 151
This is an advanced course in algebra, designed for students continuing to calculus or applied calculus. Topics include a review of number systems and basic algebra; systems of equations (including matrices and their determinants); variation; functional notation; theory of polynomial equations; study of polynomial, rational, radical, exponential, absolute value, and logarithmic functions; complex numbers; analytic geometry; and applications. Successful completion of this course fulfills the mathematics competency requirement for the AA/AS degree.
Grade Modes: Letter Graded
Credit Limitations: see counselor.
Degree Applicability: Applies to Associate Degree
AA/AS GE: D2
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: B4
IGETC: 2A

MATH V04J Just-in-Time Support for College Algebra 2 Units
In-Class Hours: 35 lecture
Corequisites: MATH V04
A review of the core prerequisite skills, competencies, and concepts for college algebra. Intended for students who are concurrently enrolled in MATH V04, college algebra. Just-in-time support topics include: learning skills, computational skills developed in intermediate algebra, the vocabulary of algebra, translation from English to algebra, and evaluation of literal expressions and functions.
Catalog Notes: This support course is required for some, but not all, sections of MATH V04; click the CRN information in the schedule of classes for each section of MATH V04 to determine whether support is required for that section; see your counselor or major advisor for more information.
Grade Modes: Pass/No Pass Grading
Degree Applicability: Not applicable for degree credit
AA/AS GE: None
Transfer Credit: None

MATH V05 Plane Trigonometry 3 Units
Formerly: MATH 5
In-Class Hours: 52.5 lecture
Prerequisites: MATH V03 or placement as determined by the college's multiple measures assessment process
C-ID: MATH 955
This course examines the six basic trigonometric functions, their definitions, relationships, and uses as they apply to: radian measure, right triangle solutions, identities, trigonometric equations, graphs, inverse functions, and complex numbers. Successful completion of this course fulfills the mathematics competency requirement for the AA/AS degree.
Advisories/Rec Prep: MATH V02 or knowledge of plane geometry
Grade Modes: Letter Graded
Degree Applicability: Applies to Associate Degree
AA/AS GE: D2
Transfer Credit: CSU
UC Credit Limitations: None
CSU GE-Breadth: B4
IGETC: None

MATH V20 Precalculus Mathematics 5 Units
Formerly: MATH 20
In-Class Hours: 87.5 lecture
Prerequisites: MATH V05 or the fourth year of high school mathematics (advanced mathematics) with grade of C or better; or placement as measured by the college assessment process
C-ID: MATH 155, MATH 955S
This course serves as a preparation for calculus. Topics include polynomial, absolute value, rational, radical, exponential, logarithmic, and trigonometric functions and their graphs; analytic geometry; matrices; series; and polar coordinates. The approach is designed to unify the concepts of mathematics at the precalculus level.
Catalog Notes: Successful completion of this course fulfills the mathematics competency requirement for the AA/AS degree.
Grade Modes: Letter Graded
Credit Limitations: see counselor.
Degree Applicability: Applies to Associate Degree
AA/AS GE: D2
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: B4
IGETC: 2A

MATH V21A Calculus with Analytic Geometry I 5 Units
In-Class Hours: 87.5 lecture
Prerequisites: Both MATH V04 and MATH V05 with grades of C or better; or MATH V20 with grade of C or better; or the fourth year of high school mathematics (advanced mathematics) with grade of C or better; or placement as determined by the college's multiple measures assessment process
C-ID: MATH 210, MATH 900S [MATH V21A + MATH V21B]
This is a first course in differential and integral calculus of a single variable which covers the elements of calculus. Topics include functions; limits; continuity; techniques and applications of differentiation and integration of algebraic, logarithmic and trigonometric functions; the Fundamental Theorem of Calculus; and L'Hospital's rule. The course is suitable for science, technology, engineering, and mathematics majors.
Catalog Notes: Successful completion of this course fulfills the mathematics competency requirement for the AA/AS degree.
Grade Modes: Letter Graded
Credit Limitations: see counselor.
Degree Applicability: Applies to Associate Degree
AA/AS GE: D2
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: B4
IGETC: 2A

MATH V21B Calculus with Analytic Geometry II 5 Units
Formerly: MATH 21B
In-Class Hours: 87.5 lecture
Prerequisites: MATH V21A or equivalent with grade of C or better
C-ID: MATH 220, MATH 900S [MATH V21A + MATH V21B]
This is a second course in differential and integral calculus. It includes applications and techniques of integration (including improper integrals), parametric and polar equations, and sequences and series. The course will also introduce applications to conic sections, and a variety of topics from other STEM disciplines. Successful completion of this course fulfills the mathematics competency requirement for the AA/AS degree.
Grade Modes: Letter Graded
Credit Limitations: see counselor.
Degree Applicability: Applies to Associate Degree
AA/AS GE: D2
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: B4
IGETC: 2A

MATH V21C Multivariable Calculus 5 Units
Formerly: Math 21C
In-Class Hours: 87.5 lecture
Prerequisites: MATH V21B or equivalent with a grade of C or better
C-ID: MATH 230
This course includes: vectors in two and three dimensions; planes, lines and surfaces in space; vector-valued functions and motion in space; partial differentiation; multiple integrals including change of variables; vector fields, including gradient, divergence, and curl; line and surface integrals; and Green's Theorem, Stokes' Theorem, and the Divergence Theorem. Successful completion of this course fulfills the mathematics competency requirement for the AA/AS degree.
Grade Modes: Letter Graded
Degree Applicability: Applies to Associate Degree
AA/AS GE: D2
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: B4
IGETC: 2A

MATH V22 Introduction to Linear Algebra 3 Units
In-Class Hours: 52.5 lecture
Prerequisites: MATH V21B
C-ID: MATH 250, MATH 910S [MATH V22 + MATH V23]
This course develops the techniques and theory needed to solve and classify systems of linear equations. Solution techniques include row operations, Gaussian elimination, and matrix algebra. Investigates the properties of vectors in two and three dimensions, leading to the notion of an abstract vector space. Vector space and matrix theory are presented including topics such as inner products, norms, orthogonality, eigenvalues, eigenspaces, and linear transformations. Selected applications of linear algebra are included.
Catalog Notes: Successful completion of this course fulfills the mathematics competency requirement for the AA/AS degree.
Grade Modes: Letter Graded
Degree Applicability: Applies to Associate Degree
AA/AS GE: D2
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: B4
IGETC: 2A

MATH V23 Introduction to Differential Equations 3 Units
In-Class Hours: 52.5 lecture
Prerequisites: MATH V21B
C-ID: MATH 240, MATH 910S [MATH V22 + MATH V23]
The course is an introduction to ordinary differential equations including both quantitative and qualitative methods as well as applications from a variety of disciplines. Introduces the theoretical aspects of differential equations, including establishing when solution(s) exist, and techniques for obtaining solutions, including, series solutions, and singular points, Laplace transforms and linear systems.
Catalog Notes: Successful completion of this course fulfills the mathematics competency requirement for the AA/AS degree.
Advisories/Rec Prep: MATH V21C or concurrent enrollment, and MATH V22
Grade Modes: Letter Graded
Degree Applicability: Applies to Associate Degree
AA/AS GE: D2
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: B4
IGETC: 2A

MATH V35 Intermediate Algebra and Applications for Health Care Personnel 5 Units
In-Class Hours: 87.5 lecture
Prerequisites: MATH V01 or placement as determined by the college's multiple measures assessment process
This course is designed for health care professionals and will enable them to apply mathematical concepts and skills to on-the-job situations. After reviewing elementary algebra and introducing intermediate algebra concepts, students will learn the various techniques of dosage calculations. The computational methods used in the preparation of oral medication, solutions, parenteral therapy, and pediatric dosages are presented. Successful completion of this course fulfills the mathematics competency requirement for the AA/AS degree.
Grade Modes: Letter Graded
Degree Applicability: Applies to Associate Degree
AA/AS GE: D2
Transfer Credit: None

MATH V38 Mathematics for Elementary School Teachers 3 Units
Formerly: MATH 38
In-Class Hours: 52.5 lecture
Prerequisites: MATH V03 or placement as determined by the college's multiple measures assessment process
C-ID: MATH 120
This course focuses on the development of quantitative reasoning skills through in-depth, integrated explorations of topics in mathematics, including real number systems and subsystems. Emphasis is on comprehension and analysis of mathematical concepts and applications of logical reasoning. This course is designed primarily for students intending to teach at the elementary or middle grades level. Successful completion of this course fulfills the mathematics competency requirement for the AA/AS degree.
Advisories/Rec Prep: MATH V02 or 1 year high school Geometry with a grade of C or better
Grade Modes: Letter Graded
Field Trips: May be required
Degree Applicability: Applies to Associate Degree
AA/AS GE: D2
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: B4
IGETC: None

MATH V38J Just-in-Time Support for Mathematics for Elementary School Teachers 1 Unit
In-Class Hours: 17.5 lecture
Corequisites: MATH V38
This course is a review of the core prerequisite skills, competencies, and concepts from arithmetic and algebra for Math for Elementary Teachers. It is intended for students who are concurrently enrolled in MATH V38. Just-in-time support topics include understanding the basic concepts and operations involving the natural numbers, whole numbers, integers, and rational numbers; solving arithmetic and algebraic application problems; simplifying, evaluating, creating, and interpreting algebraic expressions; applying Polya's problem solving principles; and applying effective learning skills for success in college.
Catalog Notes: This support course is required for some, but not all, sections of MATH V38; click the CRN information in the schedule of classes for each section of MATH V38 to determine whether support is required for that section; see your counselor or major advisor for more information.
Grade Modes: Pass/No Pass Grading
Degree Applicability: Not applicable for degree credit
AA/AS GE: None
Transfer Credit: None

MATH V40 Exploration of Mathematical Ideas 3 Units
Formerly: Math 40
In-Class Hours: 52.5 lecture
Using and expanding upon students' existing mathematical skills, this course offers the student an applications-oriented, problem-solving exploration into a variety of real-life, every day mathematical problems and situations. Topics suitable for the students may include the mathematics of finance, transformational geometry, the mathematics of voting, probability, counting methods, statistics, the mathematics of getting around (graph theory), the history of math, logic and proofs, number systems, number theory, networks and linear programming, and computer algorithms. Other mathematical topics may be discussed at the instructor's discretion. An important aspect of this course is to help students appreciate the value of mathematics in everyday life. Successful completion of this course fulfills the mathematics competency requirement for the AA/AS degree.
Catalog Notes: This course is intended for Liberal Arts majors and those students in other majors who do not need to take College Algebra or Elementary Statistics to satisfy their math requirements.
Grade Modes: Letter Graded
Degree Applicability: Applies to Associate Degree
AA/AS GE: D2
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: B4
IGETC: 2A

MATH V40J Just-in-Time Support for Exploration of Mathematical Ideas 1 Unit
In-Class Hours: 17.5 lecture
Corequisites: MATH V40
A review of the core prerequisite skills, competencies, and concepts from intermediate algebra for Exploration of Mathematical Ideas. Intended for students who are concurrently enrolled in MATH V40. Just-in-time support topics include: learning skills, computational skills developed in intermediate algebra, the vocabulary of algebra, translation from English to algebra, and evaluation of literal expressions and functions.
Catalog Notes: This support course is required for some, but not all, sections of MATH V40; click the CRN information in the schedule of classes for each section of MATH V40 to determine whether support is required for that section; see your counselor or major advisor for more information.
Grade Modes: Pass/No Pass Grading
Degree Applicability: Not applicable for degree credit
AA/AS GE: None
Transfer Credit: None

MATH V44 Elementary Statistics 4 Units
Formerly: Math 44
In-Class Hours: 70 lecture
Prerequisites: MATH V03 or MATH V35 or placement as determined by the college's multiple measures assessment process
C-ID: MATH 110
This course introduces the use of probability techniques, hypothesis testing, and predictive techniques to facilitate decision-making useful to students in areas such as business, economics, life science, social science, health science, and education. Topics include descriptive statistics; probability and sampling distributions; statistical inference; correlation and linear regression; analysis of variance, chi-square, and t-tests; hypothesis testing; and the use of technology for statistical analysis, including the interpretation of the relevance of the statistical findings. This course provides supervised computer practice designed to assist students in calculations required in introductory statistics. Successful completion of this course fulfills the mathematics competency requirement for the AA/AS degree.
Grade Modes: Letter Graded
Degree Applicability: Applies to Associate Degree
AA/AS GE: D2
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: B4
IGETC: 2A

MATH V44J Just-in-Time Support for Elementary Statistics 2 Units
In-Class Hours: 35 lecture
Corequisites: MATH V44
This course provides just-in-time support and review for transfer-level Statistics. Math V44J is intended for students who are concurrently enrolled in Math V44. Topics include learning skills and just-in-time support for concepts from arithmetic, pre-algebra, elementary and intermediate algebra, and descriptive statistics that are needed to understand the basics of college-level statistics. Recommended for students with little or no recent knowledge of algebra.
Catalog Notes: This support course is required for some, but not all, sections of MATH V44; click the CRN information in the schedule of classes for each section of MATH V44 to determine whether support is required for that section; see your counselor or major advisor for more information.
Grade Modes: Pass/No Pass Grading
Degree Applicability: Not applicable for degree credit
AA/AS GE: None
Transfer Credit: None

MATH V46 Business Calculus 3 Units
Formerly: MATH V46A; MATH 46A; MATH 46
In-Class Hours: 52.5 lecture
Prerequisites: Course taught at the level of intermediate algebra or placement as determined by the college's multiple measures assessment process
C-ID: MATH 140
This is a course in analytic geometry and calculus for students in business and management. Topics include functions and analytic geometry; differential calculus, including limits, maxima and minima; and integral calculus, including area and other applications. Successful completion of this course fulfills the mathematics competency requirement for the AA/AS degree.
Grade Modes: Letter Graded
Credit Limitations: see counselor.
Degree Applicability: Applies to Associate Degree
AA/AS GE: D2
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: B4
IGETC: 2A

MATH V52 Discrete Structures 3 Units
Same-As: CS V17
In-Class Hours: 52.5 lecture
Prerequisites: MATH V20 or both MATH V04 and MATH V05 or MATH V19 or placement as measured by the college assessment process
C-ID: MATH 160, COMP 152
This course introduces the student to discrete mathematics as it is used in computer science. Topics include formal logic, proofs, sets, combinatorics, probability, functions, graph theory, Boolean Algebra, and Modeling with programming.
Advisories/Rec Prep: CS V11 or equivalent
Grade Modes: Letter Graded
Field Trips: May be required
Credit Limitations: see counselor.
Degree Applicability: Applies to Associate Degree
AA/AS GE: D2
Transfer Credit: CSU, UC
UC Credit Limitations: None
CSU GE-Breadth: B4
IGETC: 2A

MATH V90 Directed Studies in Mathematics 1-6 Units
In-Class Hours: 52.5-315.0 laboratory
Prerequisites: Varies with topic
This course offers specialized study opportunities for students who wish to pursue projects not included in the regular curriculum. Students are accepted only by a written project proposal approved by the discipline prior to enrollment.
Grade Modes: Letter Graded, Student Option- Letter/Credit, Pass/No Pass Grading
Field Trips: May be required
Degree Applicability: Applies to Associate Degree
AA/AS GE: None
Transfer Credit: CSU
UC Credit Limitations: None
CSU GE-Breadth: None
IGETC: None

Noncredit Courses

MATH N104J Just-in-Time Support for College Algebra (Noncredit) 0 Units
Corequisites: MATH V04
This course reviews the core prerequisite skills, competencies, and concepts for college algebra. It is intended for students who are concurrently enrolled in MATH V04, College Algebra. Just-in-time support topics include learning skills, computational skills developed in intermediate algebra, the vocabulary of algebra, translation from English to algebra, and evaluation of literal expressions and functions.
Catalog Notes: This support course is required for some, but not all, sections of MATH V04; click the CRN information in the schedule of classes for each section of MATH V04 to determine whether support is required for that section; see your counselor or major advisor for more information.
Grade Modes: Pass/No Pass Grading
Repeatable for Credit: Unlimited.
Degree Applicability: Noncredit course; not applicable for degree credit
AA/AS GE: None
Transfer Credit: None

MATH N113 Math Readiness for College Success (Noncredit) 0 Units
This course reviews the core prerequisite skills, competencies, and concepts for transfer-level math courses. Topics include the real number system, solving linear, quadratic, and systems of linear equations, factoring polynomials, graphing polynomial functions, and exponentials and logarithms.
Catalog Notes: This is a non-credit course; offered on a pass/no pass basis only; not applicable for degree credit.
Grade Modes: Pass/No Pass Grading
Repeatable for Credit: Unlimited.
Degree Applicability: Noncredit course; not applicable for degree credit
AA/AS GE: None
Transfer Credit: None

MATH N138J Just-in-Time Support for Mathematics for Elementary School Teachers (Noncredit) 0 Units
Corequisites: MATH V38
This course is a review of the core prerequisite skills, competencies, and concepts from arithmetic and algebra for Math for Elementary Teachers. It is intended for students who are concurrently enrolled in MATH V38. Just-in-time support topics include understanding the basic concepts and operations involving the natural numbers, whole numbers, integers, and rational numbers; solving arithmetic and algebraic application problems; simplifying, evaluating, creating, and interpreting algebraic expressions; applying Polya's problem solving principles; and applying effective learning skills for success in college.
Catalog Notes: This support course is required for some, but not all, sections of MATH V38; click the CRN information in the schedule of classes for each section of MATH V38 to determine whether support is required for that section; see your counselor or major advisor for more information.
Grade Modes: Pass/No Pass Grading
Repeatable for Credit: Unlimited.
Degree Applicability: Noncredit course; not applicable for degree credit
AA/AS GE: None
Transfer Credit: None

MATH N140J Just-in-Time Support for Exploration of Mathematical Ideas (Noncredit) 0 Units
Corequisites: MATH V40
A review of the core prerequisite skills, competencies, and concepts for college algebra. Intended for students who are concurrently enrolled in MATH V04, college algebra. Just-in-time support topics include: learning skills, computational skills developed in intermediate algebra, the vocabulary of algebra, translation from English to algebra, and evaluation of literal expressions and functions.
Catalog Notes: This support course is required for some, but not all, sections of MATH V40; click the CRN information in the schedule of classes for each section of MATH V40 to determine whether support is required for that section; see your counselor or major advisor for more information.
Grade Modes: Pass/No Pass Grading
Repeatable for Credit: Unlimited.
Degree Applicability: Noncredit course; not applicable for degree credit
AA/AS GE: None
Transfer Credit: None

MATH N144J Just-in-Time Support for Elementary Statistics (Noncredit) 0 Units
Corequisites: MATH V44
This course provides just-in-time support and review for transfer-level Statistics. Math V44J is intended for students who are concurrently enrolled in Math V44. Topics include learning skills and just-in-time support for concepts from arithmetic, pre-algebra, elementary and intermediate algebra, and descriptive statistics that are needed to understand the basics of college-level statistics. Recommended for students with little or no recent knowledge of algebra.
Catalog Notes: This support course is required for some, but not all, sections of MATH V44; click the CRN information in the schedule of classes for each section of MATH V44 to determine whether support is required for that section; see your counselor or major advisor for more information.
Grade Modes: Pass/No Pass Grading
Repeatable for Credit: Unlimited.
Degree Applicability: Noncredit course; not applicable for degree credit
AA/AS GE: None
Transfer Credit: None

- Mathematics, Associate in Science for Transfer (http://catalog.vcccd.edu/ventura/programs-courses/mathematics/mathematics-ast/)

- Mathematics Readiness (Noncredit), Certificate of Competency (http://catalog.vcccd.edu/ventura/programs-courses/mathematics/mathematics-readiness-cocy/)