# MATHEMATICS

The Mathematics Department offers coursework in all levels of mathematics from arithmetic through differential equations and linear algebra. Students seeking improvement in their basic mathematical skills and those desiring development of advanced mathematical methods can all find meaningful activities in the mathematics program. While there are job opportunities in pure mathematics, there are even more in education, business, engineering, and other technical fields that rely on mathematics. Students planning to transfer to a four-year institution and major in mathematics or a related field should consult with a counselor regarding the transfer process and lower division requirements.

## Sequence of Mathematics Courses at SBVC

Students pursuing an AS-T in Mathematics or a STEM major are recommended to follow the STEM track sequence. Non-STEM majors should take a course in the non-STEM track, if required. Please contact a counselor to see what course is appropriate for your educational goals. Eligibility to enroll in a mathematics course is subject to the SBVC Self-Guided Placement. Please contact a counselor for details.

| Code | Title | Units |
| --- | --- | --- |
| **STEM Track** | | |
| MATH 102 | College Algebra [1] | 4 |
| MATH 103 | Plane Trigonometry [1] | 4 |
| MATH 151 | Precalculus | 4 |
| MATH 250 | Single Variable Calculus I | 4 |
| MATH 251 | Single Variable Calculus II | 4 |
| MATH 252 | Multivariable Calculus | 5 |
| MATH 265 | Linear Algebra | 4 |
| MATH 266 | Ordinary Differential Equations | 4 |
| Note: MATH 102 and MATH 103 can be taken simultaneously. | | |

| Code | Title | Units |
| --- | --- | --- |
| **Non-STEM Track** | | |
| MATH 108 | Introduction to Probability and Statistics [2] | 4 |
| MATH 115 | Ideas of Mathematics [2] | 3 |
| MATH 141 | Business Calculus [1,2] | 4 |
| MATH 102 | College Algebra [1,2] | 4 |
| MATH 103 | Plane Trigonometry [1,2] | 4 |

[1] Be advised, this course assumes a student has completed Intermediate Algebra or Algebra 2, or an equivalent such as Math III.

[2] Please contact a counselor to see if this course is appropriate to your educational goals.

| Code | Title | Units |
| --- | --- | --- |
| **Remedial Courses** | | |
| MATH 601 | Independent Lab for Fundamental Mathematical Skills | 0 |
| MATH 942 | Arithmetic | 3 |
| MATH 952 | Prealgebra | 4 |
| MATH 962 | Arithmetic and Prealgebra | 5 |
| MATH 090 | Elementary Algebra | 4 |
| MATH 095 | Intermediate Algebra | 4 |
| MATH 096 | Elementary and Intermediate Algebra | 5 |

| Code | Title | Units |
| --- | --- | --- |
| **Support Courses** | | |
| MATH 602 | Support for College Algebra | 0 |
| MATH 608 | Support for Introductory Statistics | 0 |
| Note: MATH 602 and MATH 608 are taken simultaneously with MATH 102 and MATH 108; respectively. | | |

## ALEKS Lab

This lab is located in PS - 131 and is for students enrolled in MATH 601, Independent Lab for Fundamental Mathematical Skills. Students interested in enrolling in this course must consult with a STEM counselor: http://www.sbvcstem.org/stem-counseling.php

**The benefits from the ALEKS lab include:**

- Support for non-tradition/traditional students
- Acknowledge the level of strength and weakness in mathematics
- One-on-one tutoring in Mathematics

# Contact Information

Division: Mathematics, Business, and Computer Technology (B - 127)

Division Phone Number: (909) 384-8520

Faculty Chair: Anthony Castro (acastro@sbccd.edu), M.S.

Counselor Liaisons: Deana Kelly-Silagy (dsilagy@sbccd.edu), M.A. and Armando Garcia (argarcia@sbccd.edu), M.S.C.

- Mathematics Associate in Science for Transfer Degree (http://catalog.valleycollege.edu/degree-certificate-program-index/mathematics/mathematics-ast-degree/)

**MATH 090  4 Units**
**Elementary Algebra**
**Lecture:** 72 contact hours
This course includes the basic concepts typically introduced in high school algebra, including operations on polynomials, exponents, solving linear and quadratic equations, linear inequalities, system linear of equations, word problems, factoring, rational expressions, and graphing linear equations.
**Associate Degree Applicable**

**MATH 095  4 Units**
**Intermediate Algebra**
**Lecture:** 72 contact hours
This course includes finding solutions to quadratic equations and inequalities, rational exponents and radicals, solving linear systems of equations and inequalities, functions, exponential and logarithm functions, and application problems.
**Associate Degree Applicable**

**MATH 096  5 Units**
**Elementary and Intermediate Algebra**
**Lecture:** 90 contact hours
This combined course in algebra includes the concepts typically introduced in Elementary and Intermediate Algebra. This course includes factoring, rules of exponents, operations on polynomials, rational expressions, and radical expressions. Topics also consist of finding solutions to equations, such as linear, quadratic, rational, radical, exponential and logarithmic. Additional topics include inequalities (linear, quadratic, and rational), solving linear systems of equations and inequalities, functions, and application problems.
**Associate Degree Applicable**

**MATH 102  4 Units**
**College Algebra**
**Lecture:** 72 contact hours
**Prerequisite:** Eligibility for college level Mathematics based on the SBVC Guided-Self Placement process.
This course is designed for students with a strong foundation in algebra. It includes the study of polynomial rational functions and inequalities, exponential and logarithmic functions, conics, systems of nonlinear equations and inequalities, and an introduction to sequences, series, and the Binomial Theorem.
**Associate Degree Applicable**
**Transfers to both UC/CSU**
**C-ID:** MATH 150/151

**MATH 103  4 Units**
**Plane Trigonometry**
**Lecture:** 72 contact hours
**Prerequisite:** Eligibility for college level Mathematics based on the SBVC Guided-Self Placement process.
This course provides a study of trigonometric functions, identities, trigonometric equations, periodicity, graphs of trigonometric functions, inverse trigonometric functions, solving right triangles, solving triangles using the Law of Cosines and Law of Sines, polar coordinates, and an introduction to vectors.
**Associate Degree Applicable**
**Transfers to CSU only**
**C-ID:** MATH 851

**MATH 108  4 Units**
**Introduction to Probability and Statistics**
**Lecture:** 72 contact hours
**Prerequisite:** Eligibility for college level Mathematics based on the SBVC Guided-Self Placement process.
This course is an introduction to probability, descriptive and inferential statistics, with applications to the natural sciences, life science, health science, education, business, economics, and the behavioral sciences.
**Associate Degree Applicable**
**Transfers to both UC/CSU**
**C-ID:** MATH 110

**MATH 115  3 Units**
**Ideas of Mathematics**
**Lecture:** 54 contact hours
**Prerequisite:** Eligibility for college level Mathematics based on the SBVC Guided-Self Placement process.
This course includes sets, propositional logic, inductive reasoning and applications, mathematical patterns, counting methods, and finite probability spaces.
**Associate Degree Applicable**
**Transfers to both UC/CSU**

**MATH 120  4 Units**
**Mathematical Financial Planning**
**Lecture:** 72 contact hours
**Prerequisite:** Eligibility for college level Mathematics based on the SBVC Guided-Self Placement process.
Learn the fundamentals of personal financial planning. This is a course designed to help students plan their financial life from student loans to retirement and investment strategies. Topics include credit management strategies, loan evaluation, buying and leasing automobiles, buying a house, investing and portfolios, insurance, taxes, and retirement planning. All topics developed through rigorous quantitative and mathematical applications in linear, algebraic, exponential, and logarithmic functions, sequences, series, and an introduction to portfolio risk analysis. Use of technology and financial calculators for financial planning.
**Associate Degree Applicable**
**Transfers to both UC/CSU**

**MATH 141  4 Units**
**Business Calculus**
**Lecture:** 72 contact hours
**Prerequisite:** Eligibility for college level Mathematics based on the SBVC Guided-Self Placement process.
**Advisory:** MATH 102
This course is a study of calculus techniques with emphasis placed on concepts related to business and management solutions. Additional applications of derivatives and integrals of functions including polynomials, rational, exponential and logarithmic functions are studied.
**Associate Degree Applicable**
**Transfers to both UC/CSU**

**MATH 151  4 Units**
**Precalculus**
**Lecture:** 72 contact hours
**Prerequisite:** MATH 102 and MATH 103 or eligibility for MATH 151 as determined through the SBVC assessment process.
This course is designed for students preparing to take Calculus. It deepens students' understanding of algebra and trigonometry by building on topics from College Algebra and Plane Trigonometry, both of which are foundational for Calculus students. Topics include polynomials, rational, exponential, logarithmic, and trigonometric functions and their graphs, systems of linear and nonlinear equations and inequalities, partial fraction decomposition, parametric and polar equations, and an introduction to limits.
**Associate Degree Applicable**
**Transfers to both UC/CSU**

**MATH 180  4 Units**
**Introduction to Data Science**
**Lecture:** 72 contact hours
**Prerequisite:** MATH 108
Introductory course on data collection and management, data manipulation, data modeling, statistical inference, and statistical modeling with data. Students will gain experience using a computer programming language (e.g. Python, R, etc.) to carry out statistical analysis.
**Associate Degree Applicable**
**Transfers to both UC/CSU**

**MATH 222  1-3 Units**
**Independent Study in Mathematics**
**DIR:** 54 contact hours
**Prerequisite:** Eligibility for college level Mathematics based on the SBVC Guided-Self Placement process.
Students with previous course work in mathematics may do assigned projects involving research and analysis of selected topics. This independent study is for students who are interested in furthering their knowledge of mathematics. Prior to registration, a written contract must be jointly prepared by the instructor and the student.
**Associate Degree Applicable**
**Transfers to CSU only**

**MATH 250  4 Units**
**Single Variable Calculus I**
**Lecture:** 72 contact hours
**Prerequisite:** MATH 151 or eligibility for MATH 250 as determined through the SBVC assessment process.
This is a first course in calculus, including limits, continuity, derivatives of algebraic and transcendental functions, applications of derivatives, antiderivatives, the Fundamental Theorem of Calculus, definite integrals and their applications.
**Associate Degree Applicable**
**Transfers to both UC/CSU**
**C-ID:** MATH 211/900S

**MATH 251  4 Units**
**Single Variable Calculus II**
**Lecture:** 72 contact hours
**Prerequisite:** MATH 250
This second course in calculus provides further application of definite integrals, differentiation and integration of transcendental functions, techniques of integration, L'Hopital's rule and improper integrals, infinite sequences and series, Taylor and power series, polar and parametric equations.
**Associate Degree Applicable**
**Transfers to both UC/CSU**
**C-ID:** MATH 221/900S

**MATH 252  5 Units**
**Multivariable Calculus**
**Lecture:** 90 contact hours
**Prerequisite:** MATH 251
This third course in calculus includes vectors, lines, and simple surfaces in three-dimensional space, some linear algebra topics, vector-valued functions, partial derivatives, multiple integrals, line integrals and Green's Theorem, surface integrals and the theorems of Gauss and Stokes.
**Associate Degree Applicable**
**Transfers to both UC/CSU**
**C-ID:** MATH 230

**MATH 265  4 Units**
**Linear Algebra**
**Lecture:** 72 contact hours
**Prerequisite:** MATH 250
This course develops the techniques and theory needed to solve and classify systems of linear equations. Techniques that are covered include row operations, Gaussian elimination, and the algebra of matrices. The course explores the properties of vectors in n dimensions, which leads to the notion of an abstract vector space. The theory of vector spaces and matrices are introduced, and the topics include inner products, norms, orthogonality, eigenvalues, eigenspaces, and linear transformations. Applications of linear algebra are included.
**Associate Degree Applicable**
**Transfers to both UC/CSU**
**C-ID:** MATH 250/910S

**MATH 266  4 Units**
**Ordinary Differential Equations**
**Lecture:** 72 contact hours
**Prerequisite:** MATH 251
**Advisory:** MATH 252
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.
**Associate Degree Applicable**
**Transfers to both UC/CSU**
**C-ID:** MATH 240/910S

**MATH 601  Noncredit**
**Independent Lab for Fundamental Mathematical Skills**
**Lab:** 54 contact hours
This noncredit course is offered as a study or review of the fundamental concepts of arithmetic, prealgebra, beginning algebra, and intermediate algebra as appropriate based on individual student needs. The course is intended for students who need to refresh their math skills prior to taking a college level math course.

**MATH 602  Noncredit**
**Support for College Algebra**
**Lab:** 54 contact hours
**Corequisite:** MATH 102
This noncredit course is a review of the prerequisite skills essential for college algebra. This course includes a review of topics covered in elementary and intermediate algebra as appropriate, based on individual student needs. The course is intended for students who need to refresh their math skills while enrolled in a college algebra math course to be used for just in time remediation.

**MATH 608  Noncredit**
**Support for Introductory Statistics**
**Lab:** 54 contact hours
**Corequisite:** MATH 108
This noncredit course is a review of the prerequisite skills essential for statistics. This course includes a review of topics covered in arithmetic and algebra as appropriate, based on individual student needs. The course is intended for students who need to refresh their math skills while enrolled in an introductory statistics course to be used for just in time remediation.

**MATH 651  Noncredit**
**Support for Precalculus**
**Lab:** 36 contact hours
**Corequisite:** MATH 151
This noncredit course is a review of the prerequisite skills essential for precalculus. This course includes a review of topics covered in elementary algebra, intermediate algebra, college algebra, and trigonometry as appropriate, based on individual student needs. The course is intended for students who need to refresh their math skills while enrolled in a precalculus math course to be used for just in time remediation.

**MATH 942  3 Units**
**Arithmetic**
**Lecture:** 54 contact hours
This course is a basic skills course in arithmetic including the fundamental operations of whole numbers, fractions, decimals, ratios, proportions, and percents.

**MATH 952  4 Units**
**Prealgebra**
**Lecture:** 72 contact hours
This course is an introduction to mathematical properties; exponential notation; linear equations in one variable; algebraic word problems; variables; polynomials; and the appropriate operation rules for rational numbers, whole numbers and integers; an emphasis on speaking, listening, reading, and writing in communicable mathematics terminology.

**MATH 962  5 Units**
**Arithmetic and Prealgebra**
**Lecture:** 90 contact hours
This course is an introduction to mathematical properties, including the fundamental operations of whole numbers, integers, fractions, decimals, ratios, proportions, and percent. Topics also include exponential notation, linear equations in one variable, algebraic word problems, variables, polynomials, and the appropriate operation rules for rational numbers, whole numbers and integers.