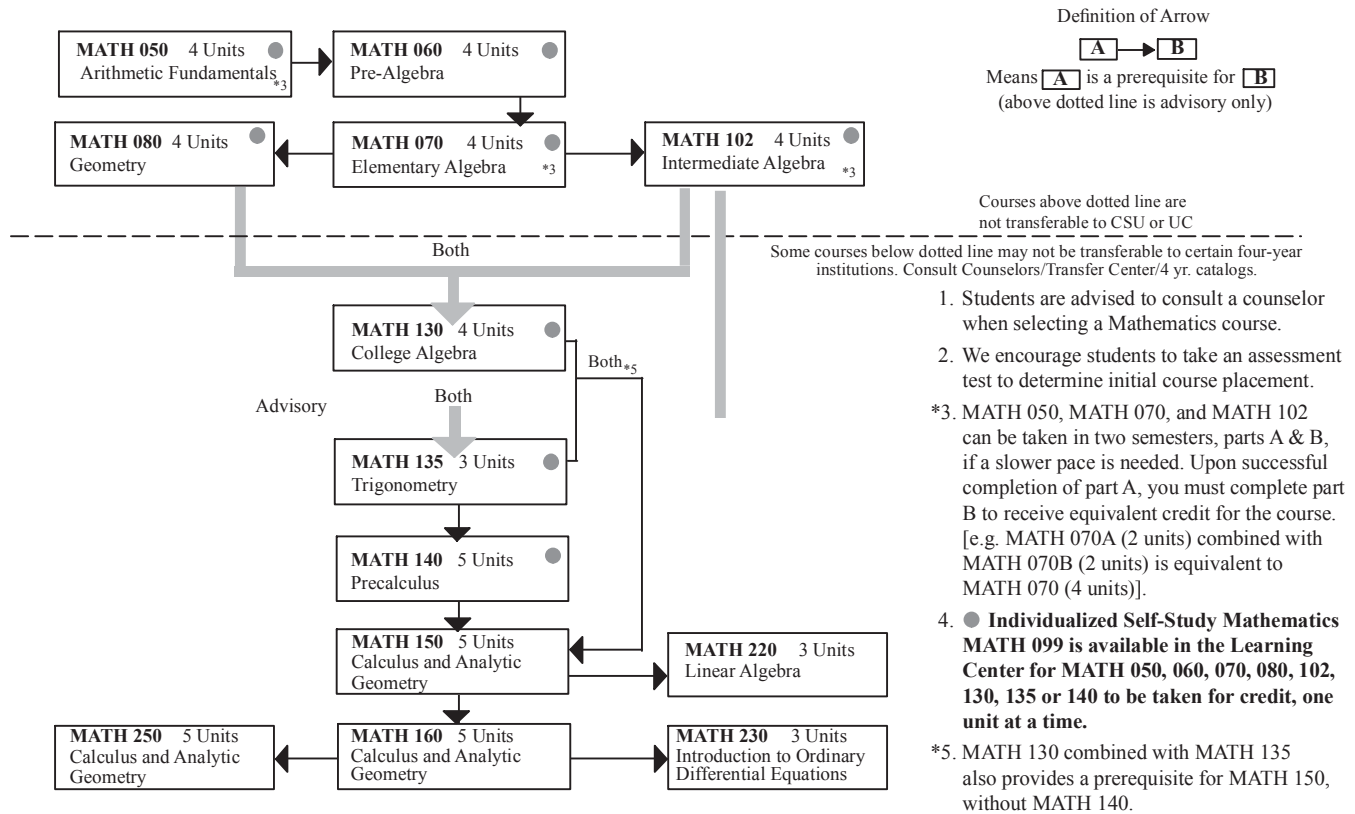
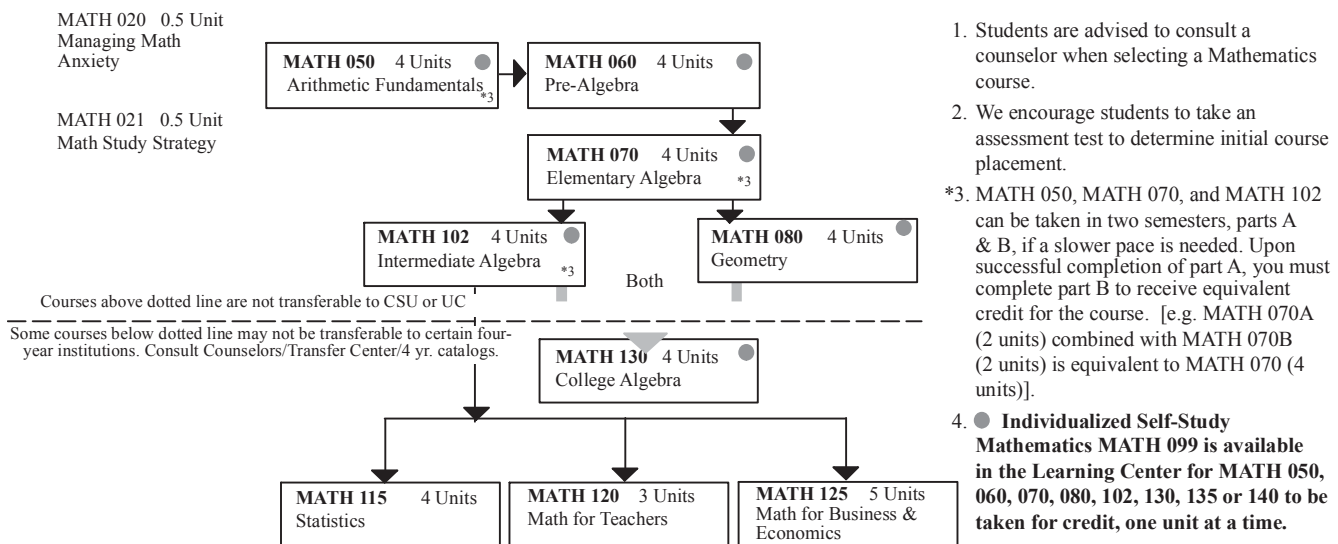


ANTELOPE VALLEY COLLEGE MATHEMATICS COURSE SEQUENCES AND PREREQUISITES

Mathematics, Engineering, Science, and some Business Majors



All Other Majors



# 228 Mathematics

## Definition

Mathematics is an important tool with which problems can be solved. Numbers, letters, or other symbols constitute the language of mathematics and, as in any language, are used to convey ideas and relationships especially in science. The final balance in a checkbook is a simple example of this relationship while landing astronauts on the moon reveals its complexity.

## Staff

To access faculty and staff, dial (661) 722-6300, then the 4-digit extension.

### Program Advisement:

Dr. Leslie Uhazy, Dean ext. 6417

### Administrative Assistant:

Wendy Cios ext. 6415

### Clerical Assistant:

Suzanne Olson ext. 6046

### Faculty:

Dr. Paul Ahad ext. 6954

Debra Anderson ext. 6745

Nabeel Atique ext. 6093

Sharon Beckman ext. 6418

Dan Byrne ext. 6419

Dr. Magdalena Caproiu ext. 6576

Nancy Cholvin ext. 6420

Roberto Diaz ext. 6421

Luis Enriquez ext. 6244

Tooraj Gordi ext. 6019

Dr. Rebecca Kitto ext. 6423

Dr. Igor Marder ext. 6238

Kenan Shahla ext. 6759

Dr. Richard Sieger ext. 6426

Dr. Joseph Towe ext. 6427

Michael Tran ext. 6595

Eugenie Trow ext. 6425

Pavinee Villapando ext. 6129

### Adjunct Faculty:

To access adjunct faculty voice mail, dial (661) 722-6300, then the 4-digit number.

V.M.

Randy Ades 2080

John Asatryan 2534

Bonnie Barger 2224

Michael Bellavia 2633

Pakawan Berry 2992

Michael Botros 2388

Snizhana J. Bowers 2051

Steve Brown 2238

Peiqing Cen 2229

Larry Dale 2230

James Disbrow 2332

Kathy Engelen 2974

Timothy Ferguson 2381

Charles Ferrari 2235

Dezdemona Ginolian 2447

Larry Gorden 2603

Dr. Mohammad Hasan 2439

Norman Hines 2356

James Jackson 2289

James Kim 2556

Laolu Laditan 2077

Lynda Little 2091

Mario Martinez-Quijada 2368

Michael McMillan 2499

Jose Menjivar 2393

Lyudmila Michael 2159

Udani Ranasinghe 2231

Peter Robles 2236

Dr. Jacquinita Rose 2979

Nash Saleh 2131

Karla Shy 2317

Yvette Thomas 2153

John Thurston 2249

Simon Tong 2175

Mike Wallace 2008

Pamela Walton 2651

Emmanuel Wreh 2497

Malik Younus 2258

## Program Description

A student may improve basic mathematical skills through remedial course work or prepare for transfer to a B.A. or B.S. program in Mathematics, Physics, Chemistry, or Engineering.

Students must receive a minimum grade of "C" or better in all required core courses and the specific courses listed as program electives in order to qualify for the degree or certificate.

## Distinctive Features

Courses in arithmetic and algebra provide the basic mathematical skills required in many fields. Statistics, linear algebra, calculus, and differential equations provide problem-solving tools for the physical and social sciences and engineering.

Math Labs: There is a math laboratory located in the Learning Center and additional support for math courses utilizing computer based instruction is found in The Prime Room, ME 100. Help in the Learning Center including

tutoring is available on a drop-in basis; while students may use The Prime Room to get assistance and complete course assignments during scheduled open hours. All math students are encouraged to utilize these learning resources.

## Career Options

Actuary  
Appraiser  
Assessor  
Auditor  
Biometrician  
Budget Analyst  
Casualty Rater  
Controller  
Computer Programmer  
Demographer  
Econometrician  
Engineering Analyst  
Epidemiologist  
Financial Analyst  
Investment Analyst  
Management Scientist  
Mathematician  
Operations Researcher  
Public Opinion Analyst  
Statistician  
Surveyor  
Systems Analyst  
Teacher  
Urban Planner  
(Most of these careers require education beyond the two-year college level.)

## Certificate Program

Certificate not applicable.

## Associate Degree

### Mathematics

An associate degree with a major in Mathematics is available. A minimum of 33 units is required. (See Graduation/Associate Degree Requirements.)

Required Courses: (33 units)	units
MATH 150, Calc. & Analytic Geom.	5
MATH 160, Calc. & Analytic Geom.	5
MATH 220, Linear Algebra	4
MATH 230, Differential Equations	4
MATH 250, Calc. & Analytic Geom.	5
PHYS 110, General Physics	5
PHYS 120, General Physics or PHYS 211, General Physics	5

**Associate in Science in Mathematics for Transfer (AS-T)**

The Associate in Science in Mathematics for Transfer (AS-T) offers students a fundamental knowledge of Mathematics and its relation to science, technology, and engineering. Students will enhance their problem solving and critical thinking skills by applying mathematical models to real world problems or utilizing mathematical objects and theorems to evaluate the validity of a statement or to prove mathematical statements.

The Associate in Science in Mathematics for Transfer (AS-T) meets the requirements of SB 1440 for Associate Degrees for Transfer. These degrees are intended to make it easier for students to transfer to a California State University campus. Specifically, if a student completes an “associate degree for transfer”:

1. The CSU shall guarantee admission with junior status.
2. Admission to the CSU does not guarantee admission for specific majors or campuses.
3. The CSU shall grant a student priority admission to his or her local CSU campus and to a program or major that is similar to his or her community college major or area of emphasis, as determined by the CSU campus to which the student is admitted.

While the degree is specifically designed for ease of transfer to a CSU, it should be noted that it does not exclude admittance to other colleges and universities.

To earn an Associate in Science in Mathematics for Transfer (AS-T) a student must complete 60 semester units that are eligible for transfer to the CSU system, should the student fall below the 60 units between the major unit requirements and the CSU-GE/IGETC pattern, the deficit units shall be comprised of CSU transferrable elective units.

1. IGETC or CSU GE Breadth
2. At least 18 units as defined in the chart below.
3. A minimum grade point average (GPA) of 2.0 is required.

<b>Required Core Courses:</b>	<b>units</b>
MATH 150, Calculus and Analytic Geometry	5
MATH 160, Calculus and Analytic Geometry	5
MATH 250, Calculus and Analytic Geometry	5

<b>Required Electives A:</b>	<b>units</b>
Choose a minimum of 6 units from below with at least 3 units from A:	
MATH 220, Linear Algebra	4
MATH 230, Introduction to Ordinary Differential Equations	4

<b>Required Electives B:</b>	<b>units</b>
Choose a minimum of 6 units from below with at least 3 units from A:	
PHYS 110, General Physics	5
MATH 115, Statistics	4
<b>Total</b>	<b>18-19</b>

**CSU/GE or IGETC Pattern 38-41**

**CSU Transferrable Elective Units to reach Degree Total 60**

**Transfer**

Students planning to continue studies at a four-year college or university after AVC should visit the Transfer Resource Center and consult with a counselor as soon as possible. Additional information on official transfer articulation agreements from AVC to many CSU/UC campuses can be found at the following Web site: [www.assist.org](http://www.assist.org)

**Prerequisite Completion**

If a course is listed as a prerequisite for another course, that prerequisite course must be completed with a satisfactory grade in order to enroll in the next course. According to Title 5, Section 55200(d), a satisfactory grade is a grade of “A,” “B,” “C” or “P”. Classes in which the Pass/No Pass option is available are indicated with an asterisk (\*) before the course title. See “Pass/No Pass Option” in the catalog for full explanation.

**Mathematics Courses**

**MATH 020 MANAGING MATH ANXIETY**

.5 unit  
8 hours total  
*Advisory: Eligibility for ENGL 097 and READ 097.*

Designed to provide students with the skills to reduce math frustration by diagnosing social causes and educational contexts and overcoming math myths and misconceptions. This course will also cover the following skills: recognizing math anxiety, developing various coping skills which include relaxation and wellness techniques, and becoming aware of personal learning style preferences for math. Math-specific testing skills will be taught using currently adopted texts for MATH 050 and MATH 070. **NOTE:** No grade will be given for this class; student will receive “pass” or “no pass” only. (Credit course not applicable to the associate degree and certificate programs.)

**MATH 021 MATH STUDY STRATEGY**

.5 unit  
8 hours total  
*Advisory: Eligibility for ENGL 097 and READ 097.*

Designed to assist students in improving their math study skills so they can develop appropriate study strategies for math classes. Various methods and techniques will be explored including: developing a math textbook study system, math textbook annotating, math lecture notetaking, listening, math problem solving strategies, test preparation, test taking strategies, relating learning preferences to math, and effective memory techniques. Time management at test time and identifying available campus resources for math will also be presented. **NOTE:** No grade will be given for this class; student will receive “pass” or “no pass” only. (Credit course not applicable to the associate degree and certificate programs.)

### MATH 050 ARITHMETIC

4 units

4 hours weekly

**Advisory:** Eligibility for MATH 050 (AVC assessment) and READ 099.

This course is for students who need preparation for college level courses and programs. The course covers addition, subtraction, multiplication, and division with whole numbers, fractions, decimals and integers. It also covers setting up ratios, solving proportions, conversions between fractions, decimals and percents, the solving of percent applications, rounding of whole numbers and decimals, order of operations, finding perimeter, area and volume of some geometric figures. Students are taught how to do measurements and to read and create simple graphs and pie charts. **NOTE:** No grade will be given for this class; student will receive “pass” or “no pass” only. (Credit course not applicable to the associate degree and certificate programs.)

### MATH 050A ARITHMETIC—FIRST HALF WITH SAS

2 units

4 hours weekly

**Advisory:** Eligibility for MATH 050A (AVC assessment) and READ 099.

This course is designed for students who need preparation for college level courses and programs. In addition, it can benefit students with math anxiety, students who wish to learn at a slower pace, as well as students with identified learning disabilities for math. It covers addition, subtraction, multiplication, and division with whole and rational (fraction) numbers. Within these set of numbers, there are topics related to real life applications such as rounding, estimation, order of operations, finding perimeter, area, and volume of different closed geometric figures. MATH 050A will include the use of math software and videotape as well as collaborative learning in a small assembly setting. This course together with MATH 050B is equivalent to MATH 050. Credit is allowed in either MATH 050 or the MATH 050A–MATH 050B combination. Concurrent enrollment in MATH 050 and MATH 050A or MATH 050B is

not permitted. **NOTE:** No grade will be given for this class; student will receive “pass” or “no pass” only. (Credit course not applicable to the associate degree and certificate programs.)

### MATH 050B ARITHMETIC—SECOND HALF WITH SAS

2 units

4 hours weekly

**Prerequisite:** Completion of MATH 050A.

**Advisory:** Eligibility for READ 099.

This course is designed for students who need preparation for college level courses and programs. It can benefit students with math anxiety, students who wish to learn at a slower pace, as well as students with identified learning disabilities for math. It covers addition, subtraction, multiplication, and division with decimals, and percents; ratios, proportions and measurements; line and bar graphs, pie charts; and introduction to algebra (signed number operations, algebraic expressions and solving simple equations). MATH 050B will include the use of math software and videotape as well as collaborative learning in a small assembly setting. This course together with MATH 050A is equivalent to MATH 050. Credit is allowed in either MATH 050 or the MATH 050A–MATH 050B combination. Concurrent enrollment in MATH 050 and MATH 050B is not permitted. **NOTE:** No grade will be given for this class; student will receive “pass” or “no pass” only. (Credit course not applicable to the associate degree and certificate programs.)

### MATH 060 PREALGEBRA

4 units

4 hours weekly

**Prerequisite:** Eligibility for MATH 060 (AVC assessment) or Completion of MATH 050.

**Advisory:** Eligibility for ENGL 099.

This course will introduce the language of algebra to students with little or no knowledge of algebra. Students will learn about the real numbers system in general, algebraic expressions and polynomials, and how to solve first degree evaluations. Previous topics discussed in arithmetic such as fractions, ratio, and proportions, decimals and percents will be reviewed.

**NOTE:** No grade will be given for this class; student will receive “pass” or “no pass” only. (Credit course not applicable to the associate degree and certificate programs.)

### MATH 070 ELEMENTARY ALGEBRA

4 units

4 hours weekly

**Prerequisite:** Eligibility for MATH 070 (AVC assessment) or Completion of MATH 060.

**Advisory:** Eligibility for READ 099.

This course is for the student who has no previous training in algebra. A student who chooses MATH 070 should have been very successful in Prealgebra (MATH 060) and should be comfortable with math. A student who feels anxious about math would be better off enrolling in MATH 070A, followed by MATH 070B the next semester. MATH 070 accelerates those two courses into one semester. Topics in MATH 070 include operations with signed numbers, variables, algebraic expressions, linear equations, word problems, exponents, polynomials, special products, factoring, algebraic fractions, graphing, systems of equations, radicals and solving quadratic equations. **NOTE:** No grade will be given for this class; student will receive “pass” or “no pass” only. (Credit course not applicable to the associate degree and certificate programs.)

### MATH 070A ELEMENTARY ALGEBRA—FIRST HALF WITH SAS

2 units

4 hours weekly

**Prerequisite:** Eligibility for MATH 070 (AVC assessment) or Completion of MATH 060.

**Advisory:** Eligibility for READ 099.

This course is for students who have not had algebra or have been unsuccessful in algebra. This course can benefit students with math anxiety, students who wish to learn at a slower pace, and students with identified learning disabilities. Topics include operations with signed numbers, variables, algebraic expressions, linear equations, word problems, graphing, and systems of equations. Included is the use of math software and videotapes

as well as collaborative learning in a small assembly setting. This course, together with MATH 070B, is equivalent to MATH 070. Credit is allowed in either MATH 070 or the MATH 070A–MATH 070B combination. Concurrent enrollment in MATH 070 and MATH 070A is not permitted. **NOTE:** No grade will be given for this class; student will receive “pass” or “no pass” only. (Credit course not applicable to the associate degree and certificate programs.)

### **MATH 070B ELEMENTARY ALGEBRA—SECOND HALF WITH SAS**

2 units

4 hours weekly

**Prerequisite:** Completion of MATH 070A or two equivalent units of MATH 070 through MATH 099.

**Advisory:** Eligibility for READ 099.

This course can benefit students with math anxiety, students who wish to learn at a slower pace, and students with identified learning disabilities. Topics covered are fractions, exponents, polynomials, special products, factoring, radicals, solving quadratic equations and word problems. Students should already know operations with signed numbers, variables, algebraic expressions, linear equations, word problems, graphing and systems of equations. Included is the use of math software and videotapes as well as collaborative learning in a small assembly setting. This course, together with MATH 070A, is equivalent to MATH 070. Credit is allowed in either MATH 070 or the MATH 070A-070B combination. Concurrent enrollment in MATH 070 and MATH 070A or 070B is not permitted. **NOTE:** No grade will be given for this class; student will receive “pass” or “no pass” only. (Credit course not applicable to the associate degree and certificate programs.)

### **MATH 080 PLANE GEOMETRY**

4 units

4 hours weekly

**Advisory:** Completion of MATH 070, or Eligibility for MATH 102 (AVC assessment) and READ 099.

This pass/no pass course covers plane

Euclidean geometry and includes an introduction to solid geometry. The first part of the course emphasizes the development of the theorems and properties of geometric figures and the concept of proof in an axiomatic system. The second part of the course covers the derivation and application of measurement formulas for area, volume, trigonometric ratios, and applications. Recommended for students intending to take algebra-based courses beyond MATH 070, drafting, nursing, or graphics courses. **NOTE:** No grade will be given for this class; student will receive “pass” or “no pass” only. (Credit course not applicable to the associate degree and certificate programs.)

### **MATH 099 INDIVIDUALIZED SELF-STUDY MATHEMATICS**

1–32 units

4 hours weekly

**Advisory:** AVC Math Assessment Test.

(The Course Requisites for each class taken in MATH 099 are the same as those for the course named in the course description.)

Individualized and self-paced study of arithmetic through precalculus in a supervised environment for the motivated student. These courses include MATH 050, MATH 060, MATH 070, MATH 080, MATH 102, MATH 130, MATH 135 and MATH 140. Students may choose from single unit courses: MATH 050C, D, E, F; MATH 060C, D, E, F; MATH 070C, D, E, F; MATH 080C, D, E, F; MATH 102C, D, E, F; MATH 130C, D, E, F; MATH 135C, D, E; and MATH 140C, D, E, F, G, and can enroll in only one unit at a time. Upon satisfactory completion of that unit, students may proceed to the next unit. At least one unit must be completed each semester. The instructor will explain the unit system and assist students with selection of the appropriate unit course at the first class meeting. The instructor will also give initial orientation explaining testing, review tests to help students define what skills have been mastered, and refer students to readily available support services. Instructor does not lecture nor does he/she structure the pace of

materials or determine when a student needs to proceed other than by setting five deadlines for completion of one unit. Regular attendance is expected. **NOTE:** MATH 050, MATH 060, MATH 070 and MATH 080 - No grade will be given for these classes; student will receive “pass” or “no pass” only. (See specific math course for degree applicability and transferability.)

### **MATH 102 \*INTERMEDIATE ALGEBRA**

4 units

4 hours weekly

**Prerequisite:** Eligibility for MATH 102 (AVC assessment) or Completion of MATH 070.

**Advisory:** Eligibility for READ 099.

This course is for the student who has been very successful completing elementary algebra and who is comfortable taking math classes, since it accelerates MATH 102A and MATH 102B into one semester. Topics include: formulas and word problems; graphs, slopes and equations of lines; introduction to functions; systems of equations; linear inequalities; exponents and polynomials with factoring; rational expressions and equations; radical expressions and equations; exponential and logarithmic functions; quadratic equations and functions; circles; and word problems appropriate to all these topics. (AVC)

### **MATH 102A \*INTERMEDIATE ALGEBRA—FIRST HALF WITH SAS**

2 units

4 hours weekly

**Prerequisite:** Eligibility for MATH 102 (AVC assessment) or Completion of MATH 070.

**Advisory:** Eligibility for READ 099.

This course is for the student who has successfully completed elementary algebra. It can benefit students with math anxiety, students who do not wish to accelerate the pace for this course, and students with identified learning disabilities. Topics include: formulas and word problems; graphs, slopes and equations of lines; introduction to

## 232 Mathematics

---

functions; systems of equations; linear inequalities; exponents and polynomials with factoring; and word problems appropriate to all these topics. This course, together with MATH 102B, is equivalent to MATH 102. (AVC)

### **MATH 102B**

#### **\*INTERMEDIATE**

#### **ALGEBRA—SECOND HALF WITH SAS**

2 units

4 hours weekly

**Prerequisite:** Completion of MATH 102A or two equivalent units of MATH 102 through MATH 099.

**Advisory:** Eligibility for READ 099.

This course is for students who have successfully completed MATH 102A, or its equivalent through MATH 099. It can benefit students with math anxiety, students who do not wish to accelerate the pace for this course, and students with identified learning disabilities. Topics include: rational expressions and equations; radical expressions and equations; exponential and logarithmic functions; quadratic equations and functions; circles; and word problems appropriate to all these topics. This course, together with MATH 102A, is equivalent to MATH 102. (AVC)

### **MATH 115 STATISTICS**

4 units

4 hours weekly

**Prerequisite:** Completion of MATH 102.

**Advisory:** Eligibility for College Level Reading.

This is an introductory course in statistical procedure. It includes a study of graphs, central tendency, dispersion, normal curve, probability, binomial distribution, estimation, hypothesis testing, regression, correlation and chi-square. (CSU, UC, AVC)

### **MATH 120 \*MATH FOR TEACHERS**

3 units

3 hours weekly

**Prerequisite:** Completion of MATH 102.

**Advisory:** Eligibility for College Level Reading.

Sets, systems of numeration, nature of

numbers, fundamentals of operations, relations and functions, integers, rational and real numbers, and computer applications. This course is an essential prerequisite for elementary school teachers as well as junior high and high school math teachers. Students will do computer exercises in the college Learning Center. (CSU, UC, AVC)

### **MATH 125 MATH FOR BUSINESS AND ECONOMICS**

5 units

5 hours weekly

**Prerequisite:** Completion of MATH 102.

**Advisory:** Eligibility for College Level Reading.

Application of mathematics to problems in business and economics, sets, quadratics, exponential and logarithmic functions, inequalities, matrices, elementary calculus, differentiation, integration, and extreme values. (Not open for students majoring in physical sciences or math). (CSU, UC, AVC)

### **MATH 130 \*COLLEGE ALGEBRA**

4 units

4 hours weekly

**Prerequisite:** Completion of MATH 102.

**Advisory:** Completion of MATH 080, or Eligibility for MATH 130 and College Level Reading.

Course is designed to extend students' mathematical ability to deal with real world problems. It meets the needs of transfer students and is an important course in areas of engineering, biology, physics, computer and mathematical sciences. Topics include theory of equations, including polynomial equations of higher degree; functions, inverse functions and their graphs, including exponential and logarithmic functions; systems of equations; determinants; inequalities; complex numbers; mathematical induction; sequences and summation notation; binomial theorem; and counting principles. (CSU, UC, AVC)

### **MATH 135 \*PLANE TRIGONOMETRY**

3 units

3 hours weekly

**Prerequisite:** Completion of MATH 102 and MATH 080, or Eligibility for MATH 135.

**Advisory:** Completion of ENGL 101 or Eligibility for College Level Reading.

This course is for the student who is preparing for calculus, physics, engineering, and other applications requiring trigonometry. Topics include the trigonometric functions, basic identities, inverse trigonometric functions, solutions of triangles, trigonometric equations, and introduction to vectors. (CSU, AVC)

### **MATH 140 \*PRECALCULUS**

5 units

5 hours weekly

**Prerequisite:** Completion of MATH 102.

**Advisory:** Completion of MATH 080 and MATH 135, or Eligibility for MATH 140 and College Level Reading.

This course is primarily for students who have completed intermediate algebra and trigonometry and are preparing to study calculus or other mathematically oriented courses in such areas as economics, general business, chemistry, physics, engineering, biological sciences, and technical and vocational education. Topics include those covered in College Algebra and Trigonometry. See those course descriptions for details. (CSU, UC, AVC)

### **MATH 150 CALCULUS AND ANALYTIC GEOMETRY**

5 units

5 hours weekly

**Prerequisite:** Completion of MATH 140 or MATH 130 and MATH 135.

**Advisory:** Eligibility for MATH 150 and College Level Reading.

This course is for the student planning upper-division work in math, physics, engineering or business. It involves differentiation and integration of algebraic, trigonometric, exponential, and logarithmic functions. Applications include extrema, graphing, related rates, area. (CSU, UC, AVC)

### **MATH 160 CALCULUS AND ANALYTIC GEOMETRY**

5 units

5 hours weekly

**Prerequisite:** Completion of MATH 150.

**Advisory:** Eligibility for College Level Reading.

This course is a continuation of Math 150. It includes applications of integration, integration techniques, indeterminate forms, improper integrals, infinite series, and topics in analytic geometry. (CSU, UC, AVC)

### **MATH 220 LINEAR ALGEBRA**

4 units

4 hours weekly

**Prerequisite:** Completion of MATH 150.

**Advisory:** Eligibility for College Level Reading.

This is an introductory course in linear algebra, designed for transfer students majoring in the mathematical, biological, physical, engineering, sociological or managerial sciences. Topics to be covered include systems of linear equations, matrices, determinants, vector spaces, inner product spaces, linear transformations, eigenvalues and eigenvectors. This course will include references to applications of the above topics in the areas of differential equations, least squares fitting to data, geometry of linear operators on  $\mathbb{R}^2$ , diagonalizing quadratic forms and conic sections. (CSU, UC, AVC)

### **MATH 230 INTRODUCTION TO ORDINARY DIFFERENTIAL EQUATIONS**

4 units

4 hours weekly

**Prerequisite:** Completion of MATH 160.

**Advisory:** Completion of MATH 220 and MATH 250, and Eligibility for College Level Reading.

This is an introduction course in solving numerous types of ordinary differential equations including first order linear and nonlinear equations, higher order linear equations, systems of linear equations, and the associated initial value problems. In addition to the standard methods, the Laplace transform, power series method, and matrix method are covered. Applications of differential equations in physics, chemistry, economics and social sciences will be studied throughout the course. (CSU, UC, AVC)

### **MATH 250 CALCULUS AND ANALYTIC GEOMETRY**

5 units

5 hours weekly

**Prerequisite:** Completion of MATH 160.

**Advisory:** Eligibility for College Level Reading.

This course is a continuation of MATH 160. Includes vector theory and the geometry of 3-dimensional space, vector-valued functions, functions of several variables, partial differentiation, multiple integration and vector analysis. (CSU, UC, AVC)