1. Students are advised to consult a counselor when selecting a Mathematics course.

2. New students are required to take an assessment test to determine initial course placement. See Student Success and Support Program for alternatives and exemptions.

3. Individualized Self-Study Mathematics MATH 099 is available in the Learning Center for MATH 065, 070, or 102 to be taken for credit, one unit at a time.

4. MATH 130 combined with MATH 135 also provides a prerequisite for MATH 150, without MATH 140.
Defining Mathematics
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
  - Dr. Magdalena Caprioiu ext. 6576
  - Nancy Cholvin ext. 6420
  - Roberto Diaz ext. 6421
  - Luis Enriquez ext. 6244
  - Dezdemona Ginosian ext. 6971
  - Tooraj Gordi ext. 6019
  - Dr. Cindy Hendrix
  - Dr. Igor Marder ext. 6238
  - Dr. Ryoichi Osawa
  - 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
  - Michael Bellavia 2633
  - Pakawan Berry 2992
  - Snizhana J. Bowers 2051
  - Steve Brown 2238
  - Pei Qing Cen 2229
  - Larry Dale 2230
  - James Disbrow 2332
  - Kathy Engelen 2974
  - Timothy Ferguson 2381

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)

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 150, Calc. &amp; Analytic Geom.</td>
<td>5</td>
</tr>
<tr>
<td>MATH 160, Calc. &amp; Analytic Geom.</td>
<td>5</td>
</tr>
<tr>
<td>MATH 220, Linear Algebra</td>
<td>4</td>
</tr>
<tr>
<td>MATH 230, Differential Equations</td>
<td>4</td>
</tr>
<tr>
<td>MATH 250, Calc. &amp; Analytic Geom.</td>
<td>5</td>
</tr>
<tr>
<td>PHYS 110, General Physics</td>
<td>5</td>
</tr>
<tr>
<td>PHYS 120, General Physics or PHYS</td>
<td>5</td>
</tr>
<tr>
<td>211, General Physics</td>
<td>5</td>
</tr>
</tbody>
</table>
Associate in Science in Mathematics for Transfer (AS-T in Mathematics)
The Associate in Science in Mathematics for Transfer (AS-T in Mathematics) degree 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 in Mathematics) degree meets the requirements of SB 1440 for Associate Degrees for Transfer (ADT). These degrees are intended to make it easier for students to transfer to California State University campuses, but do not exclude admittance to other colleges or universities.

To earn an Associate in Science in Mathematics for Transfer (AS-T in Mathematics) degree a student must complete the following:

1. Completion of 60 semester units or 90 quarter units that are eligible for transfer to the California State University, including both of the following:
   (A) The Intersegmental General Education Transfer Curriculum (IGETC) or the California State University General Education – Breadth Requirements.
   (B) A minimum of 18 semester units or 27 quarter units in a major or area of emphasis, as determined by the community college district.

2. Obtainment of a minimum grade point average of 2.0.

ADTs also require that students must earn a C or better in all courses required for the major or area of emphasis. A “P” (Pass) grade is not an acceptable grade for courses in the major.

<table>
<thead>
<tr>
<th>Required Core Courses:</th>
<th>units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 150, Calculus and Analytic Geometry</td>
<td>5</td>
</tr>
<tr>
<td>MATH 160, Calculus and Analytic Geometry</td>
<td>5</td>
</tr>
<tr>
<td>MATH 220, Linear Algebra</td>
<td>4</td>
</tr>
<tr>
<td>MATH 230, Introduction to Ordinary Differential Equations</td>
<td>4</td>
</tr>
</tbody>
</table>

Choose a minimum of 8 units from the lists below with at least 4 units from A:

<table>
<thead>
<tr>
<th>Required Electives A:</th>
<th>units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 220, Linear Algebra</td>
<td>4</td>
</tr>
<tr>
<td>MATH 230, Introduction to Ordinary Differential Equations</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Required Electives B:</th>
<th>units</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 110, General Physics</td>
<td>5</td>
</tr>
<tr>
<td>MATH 115, Statistics</td>
<td>4</td>
</tr>
</tbody>
</table>

Total 23-24

CSU GE or IGETC Pattern 37-39

CSU Transferrable Elective Units to reach Degree Total 60

*Courses denoted with an asterisk will fulfill the completion requirements for both the major and general education.

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

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.

MATH 020 MANAGING MATH ANXIETY .5 unit 8 hours total

Advisory: Eligibility for ENGL 097 and READ 095.

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 065 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 095.

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 note taking, 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 065 BASIC MATH
4 units
4 hours weekly
Prerequisite: Eligibility for MATH 065 (AVC assessment).
Advisory: Eligibility for ENGL 099.
This course is intended to prepare students for the Beginning Algebra and other college level courses and programs. It covers basic operations with whole numbers, rational numbers and integers. Students will learn how to solve proportions, percent problems and find perimeter, area, and volume of basic geometric figures and solids. Students will be introduced to the language of Algebra and learn how to evaluate algebraic expressions and solve first degree equations. MATH 065 is not a transferable course and does not satisfy GE requirements. 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 065.
Advisory: Eligibility for READ 099.
This course is for the student who has had some previous training in algebra. Topics include operations with signed numbers, variables, algebraic expressions, linear equations, word problems, exponents, polynomials, special products, factoring, algebraic fractions, graphing, systems of equations, and graphing linear equations in two variables. 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 065.
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.
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 070B ELEMENTARY ALGEBRA—SECOND HALF WITH SAS
2 units
4 hours weekly
Prerequisite: Completion of MATH 070A.
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 099 INDIVIDUALIZED SELF-STUDY MATHEMATICS
1–12 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 the basic skills courses from Arithmetic to Intermediate Algebra in a supervised environment for the motivated student. These courses include MATH 065 (C, D, E, and F), MATH 070 (C, D, E, and F), and MATH 102 (C, D, E, and F). Students may choose from single unit courses:
MATH 065C, 065D, 065E, 065F, 070C, 070D, 070E, 070F, 102C, 102D, 102E, 102F and enroll in only one unit at a time. Upon satisfactory completion of that unit, students may proceed to the next unit. At least four units must be completed in any academic year which also includes Winter and Summer sessions. 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 deadlines for completion of one unit. Regular attendance is expected. Grading for MATH 065C through 070F is P (for pass ) and NP (for no-pass). Students will earn letter grades A, B, C, D, or F in Math 102C through 102F. Letter grade I (incomplete) will not apply to Math 099 sequence.

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: Radical Expressions and Equations, Quadratic Equations and their graphs, Circles, Introduction to Functions, Systems of Linear Equations and Inequalities, Compound and Absolute Value Inequalities, Exponential and Logarithmic Functions, 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 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.
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, AVC)

MATH 124 FINITE MATH
4 units
4 hours weekly
Prerequisite: Completion of MATH 102.
Advisory: Eligibility for College Level Reading.
Finite Math is designed for students interested in business, social and behavioral sciences. Topics include Linear Functions, Matrices, Linear Programming, Mathematics of Finance, Sets and Logic, Probability, Statistics, and Markov Chains. (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 or 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. (Not open for students majoring in physical sciences or math.) (CSU, UC, AVC)

**Advisory:** Completion of MATH 080 and MATH 135 or Eligibility for MATH 140, and Eligibility for 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 148  CALCULUS FOR BUSINESS & ECONOMICS**
4 units
4 hours weekly
**Prerequisite:** Completion of MATH 130 or MATH 124.

This is an introductory course in calculus for students in business, management, economics, and social sciences who require more advanced mathematics. The course emphasizes on applications of derivatives and integrals. Topics include functions, limits, continuity, graphing, differentiation, and integration. (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. (Not open for students majoring in physical sciences or math.) (CSU, UC, AVC)

**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 R2, 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)