

Degree: A.S. - Mathematics
A.S. - Mathematics-Physical Science

Area: Mathematics
Dean: Mary Jones
Phone: (916) 484-8215
Counseling: (916) 484-8572

Mathematics Degree

The A.S. degree in mathematics provides a foundation of mathematics for students in preparation for transfer to a four-year program in mathematics or statistics. Course work includes a three-semester calculus series, differential equations, linear algebra, and statistics and/or symbolic logic.

Requirements for Degree Major		25 units
MATH 400	Calculus I	5
MATH 401	Calculus II	5
MATH 402	Calculus III	5
MATH 410	Introduction to Linear Algebra	3
MATH 420	Differential Equations	4
<i>And a minimum of 3 units from the following:</i>		3
PHIL 325	Symbolic Logic (3)	
or MATH 320	Symbolic Logic (3)	
STAT 481	Introduction to Probability and Statistics - Honors (3)	
or STAT 301	Introduction to Probability and Statistics (3)	

Associate Degree Requirements: The Mathematics Associate in Science (A.S.) Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See ARC graduation requirements.

Mathematics/Physical Science Degree

This program provides a broad study in fields of physical science and mathematics. It provides a good foundation for transfer to a four-year program in science.

Requirements for Degree Major		18 units
<i>A minimum of 18 units from the following:</i>		18
Transfer-level courses selected from:		
(1) Science: could be astronomy, and/or chemistry, and/or engineering, and/or geology, and/or physical geography, and/or physical science and/or physics.		
And (2) Math: could be mathematics and/or statistics.		

Associate Degree Requirements: The Mathematics/Physical Science Associate in Science (A.S.) Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See ARC graduation requirements.

Mathematics

MATH 10 Developing Confidence in Math 1 Unit

Prerequisite: None

Advisory: Concurrent enrollment in another math course.

Hours: 18 hours LEC

This course helps students to recognize common fears and misconceptions of mathematics, and to overcome math anxiety and avoidance. Strategies to achieve success in mathematical situations are discussed. This course is also useful for tutors, counselors, and teachers interested in helping others overcome their math anxiety. Credit/No Credit only.

MATH 12 Mathematics for the Home and Workplace 2 Units

Prerequisite: None

Hours: 36 hours LEC

This course will use a variety of realistic consumer-oriented applications to refresh, reinforce, and extend students' mastery of basic mathematics concepts. The applications will include earned wages, buying and maintaining a car, working with food, budgeting, banking, and other consumer and job related activities. Calculator use will be an integral part of the course.

MATH 25 Computational Arithmetic 3 Units

Prerequisite: None

Advisory: Confirm placement using ARC's Math Self-Assessment System.

Hours: 54 hours LEC

This course covers fundamentals of arithmetic with an emphasis on computational skills. Topics include whole numbers, fractions, decimals, problem solving, and applications.

MATH 32 Pre-Algebra 3 Units

Prerequisite: MATH 25 with a grade of "C" or better, or placement through assessment.

Hours: 54 hours LEC

This course will briefly review the fundamentals of arithmetic, including whole numbers, fractions, and decimals. Course content will include order of operations, signed numbers, concepts of variables, exponents, ratios and proportions, area/perimeter/volume of geometric figures, and solving equations.

MATH 100 Elementary Algebra 5 Units

Prerequisite: MATH 32 with a grade of "C" or better or placement through the assessment process.

Hours: 90 hours LEC

This course includes the fundamental concepts and operations of algebra with problem solving skills emphasized. Topics include properties of real numbers, linear equations and inequalities, integer exponents, polynomials, and factoring polynomials. Other topics include rational exponents and rational/radical expressions with associated equations. Additional topics introducing the rectangular coordinate system, focus on graphs and equations of lines, systems of linear equations/inequalities, and solving quadratic equations. AA/AS area 4C.

MATH 110 Elementary Geometry 5 Units

Prerequisite: MATH 100 with a grade of "C" or better or placement through the assessment process.

Hours: 90 hours LEC

This course covers aspects of elementary geometry. Topics include terms and definitions, properties of parallel lines and parallelograms, congruent and similar triangles, properties of triangles, right triangles, and basic trigonometry. Later topics include properties of circles, construction of loci, areas, and volumes. The course also emphasizes problem solving strategies, elementary logic, and reading and writing proofs. AA/AS area 4C.

MATH 120 Intermediate Algebra 5 Units

Formerly: MATH 53

Prerequisite: MATH 100 with a grade of "C" or better, or placement through assessment.

Hours: 90 hours LEC

This course reviews and extends the concepts of elementary algebra with problem solving skills emphasized throughout. Topics which are reviewed and extended include linear and quadratic equations, factoring polynomials, rational expressions, exponents, radicals, equations of lines, and system of equations. New topics include graphs and their translations and reflections, functions, exponential and logarithmic functions, graphs of quadratic and polynomial functions, nonlinear systems of equations, polynomial and rational inequalities, and an introduction to conic sections. AA/AS area 3D and 4C.

MATH 300 Introduction to Mathematical Ideas 3 Units

Formerly: MATH 1

Prerequisite: Mathematics 120 with a grade of "C" or better.

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course focuses on elements of mathematical systems. It is designed to make fundamental concepts and processes more meaningful to the general student. Its content may include systems, logic, geometry, combinatorics, probability, statistics, sets, matrices, and number theory. Not recommended for students entering elementary school teaching or business administration majors. (CAN MATH 2) AA/AS area 3D and 4C; CSU area B3

MATH 310 Mathematical Discovery 3 Units

Formerly: MATH 2

Prerequisite: Mathematics 110 and 120 with a grade of "C" or better.

Course Transferable to UC/CSU

Hours: 54 hours LEC

In this course students will explore mathematical patterns and relations, and formulate and prove conjectures. Topics from number theory, probability and statistics, and geometry will be investigated. Recommended for students interested in education. (CAN MATH 4) AA/AS area 3D & 4C; CSU area B3.

MATH 315 Exploratory Field Experience in Mathematics 3 Units

Prerequisite: MATH 120 with a grade of "C" or better.

Enrollment Limitation: Current TB clearance is required prior to work in schools. Fingerprinting may also be required.

Course Transferable to CSU

Hours: 36 hours LEC; 54 hours LAB

This course is an education-based field experience in mathematics allowing students to explore teaching as a career choice. Students are assigned to area schools to observe and/or assist in a mathematics classroom. Students have the opportunity to learn and practice essential skills to assist younger students with their progress through the mathematics sequence, and to learn about social, cultural, and educational issues related to mathematics and the school environment. Weekly seminars allow students to share experiences and compare observations. This course is recommended for those who may wish to pursue a single-subject credential in mathematics. AA/AS area 3E

MATH 320 Symbolic Logic 3 Units

Same As: PHIL 325.

Prerequisite: PHIL 320 or MATH 110, and MATH 120 with a grade of "C" or better

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course covers an introduction to symbolic logic including the logic of sentences (the statement calculus) and the logic of classes and relations (the predicate calculus), together with an introduction to the nature and development of deductive systems. Applications include examples of logic used in elementary mathematics and the analysis of verbal arguments. Not open to students who have completed PHIL 325. AA/AS area 3D and 4C; CSU area B3.

MATH 325 Problem-Solving 3 Units

Formerly: MATH 3

Prerequisite: MATH 120 with a grade of "C" or better, or placement through assessment process.

Course Transferable to CSU

Hours: 54 hours LEC

This course focuses on the problem-solving skills necessary to solve both real-life and nontraditional mathematics problems. Problem-solving strategies presented in this course include: drawing a diagram, eliminating possibilities, making a systematic list, looking for a pattern, guessing and checking, solving an easier related problem, working backward, algebraic representation, finite differences, and other related techniques. Divergent thinking, group work, and the clear presentation of mathematical work will be emphasized throughout the course. AA/AS area 3D and 4C; CSU area B3.

MATH 330 Trigonometry 3 Units

Prerequisite: MATH 110 and 120 with grades of "C" or better.

Course Transferable to CSU

Hours: 54 hours LEC

This course presents the fundamentals of trigonometry. Topics include definitions of trigonometric and circular functions, graphs, identities and applications. Other material covered includes solving trigonometric equations, solving triangles using the Laws of Sines and Cosines, vectors, polar coordinates and polar representations of complex numbers. (CAN MATH 8) AA/AS area 3D and 4C; CSU area B3.

MATH 340 Calculus for Business and Economics 3 Units

Prerequisite: MATH 120 with a grade of "C" or better.

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course is an introduction to differential and integral calculus with applications in the fields of business, economics, social science and biological science. It is not recommended for mathematics and physical science majors. (CAN MATH 34) AA/AS area 3D and 4C; CSU area B3; IGETC area 2.

MATH 342 Modern Business Mathematics 3 Units

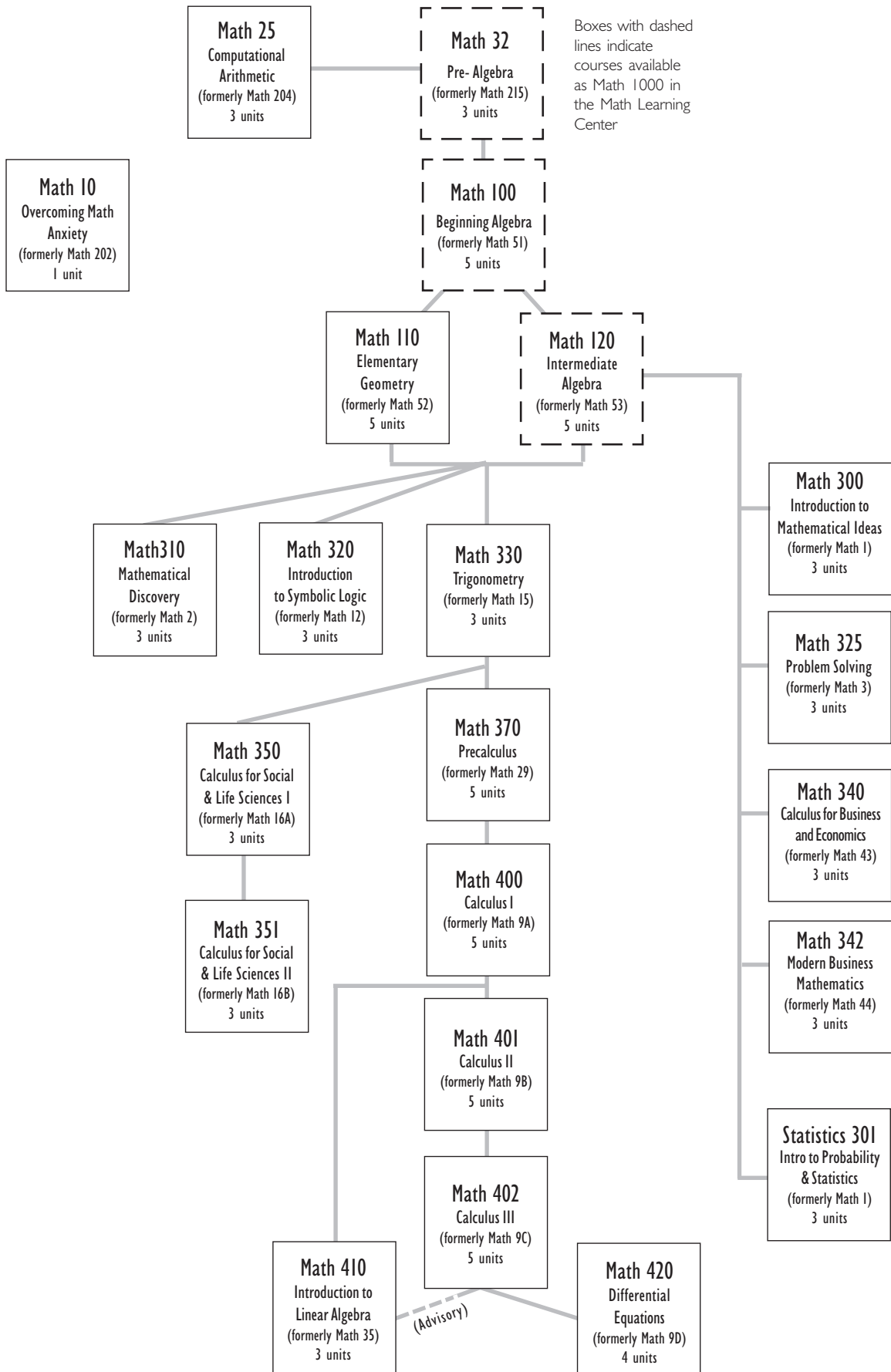
Prerequisite: MATH 120 with a grade of "C" or better.

Course Transferable to CSU

Hours: 54 hours LEC

This course is designed around applications of mathematics in economic and business contexts. Specific topics include functions and related business formulas, tables and graphs, finance (interest and exponential models in economics), rates of change including applications and optimization, and linear programming. AA/AS area 3D & 4C; CSU area B3.

Mathematics Courses



MATH 344 Finite Mathematics 3 Units

Formerly: MATH 42

Prerequisite: MATH 120 with a grade of "C" or better.

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course covers sets, probability and combinatorics, expected value, matrix theory, systems of equations and inequalities, linear programming, and mathematics of finance with emphasis on applications in business administration, biological sciences, and social science. It also includes computer applications. (CAN MATH 12) AA/AS area 3D and 4C; CSU area B3; IGETC area 2

MATH 350 Calculus for the Life and Social Sciences I 3 Units

Prerequisite: MATH 330 with a grade of "C" or better.

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course covers functions, limits, and derivatives, and introduces antiderivatives. Algebraic and computational techniques are emphasized in applications from business, and social and biological sciences. It is not recommended for math or engineering majors. (CAN MATH 30) (MATH SEQ D) AA/AS area 3D and 4C; CSU area B3; IGETC area 2.

MATH 351 Calculus for the Life and Social Sciences II 3 Units

Formerly: MATH 16B

Prerequisite: MATH 350 with a grade of "C" or better.

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course is the continuation of MATH 350. It covers integration and differentiation of commonly used functions, and applications of analytic geometry and calculus. (CAN MATH 32) (MATH SEQ D) AA/AS area 4C; CSU area B3; IGETC area 2

MATH 360 Introduction to Scientific Graphing Calculators 1 Unit

Formerly: MATH 28

Prerequisite: MATH 330 with a grade of "C" or better or placement through assessment.

Course Transferable to CSU

Hours: 18 hours LEC

This course introduces the basic functions and applications of scientific graphic calculators. It covers plotting, evaluating, and solving functions. It also discusses calculator-based solutions of problems from algebra and trigonometry; and introduces techniques that will be useful in subsequent courses like precalculus and calculus. A calculator of a model and type that will be specified by instructor is required.

MATH 370 Pre-Calculus Mathematics 5 Units

Prerequisite: MATH 330 with a grade of "C" or better.

Course Transferable to UC/CSU

Hours: 90 hours LEC

This course includes application and graphing of polynomial, logarithmic, exponential and trigonometric functions, as well as systems of linear and non-linear equations and inequalities. It also covers analytic geometry including straight lines, conic sections, graphing and curve sketching. (CAN MATH 16) AA/AS area 3D and 4C; CSU area B3; IGETC area 2.

MATH 400 Calculus I 5 Units

Prerequisite: MATH 370 with a grade of "C" or better.

Advisory: Students who took Precalculus in a non-college setting should confirm adequate preparation for Math 400 using ARC's Math Self-Assessment System.

Course Transferable to UC/CSU

Hours: 90 hours LEC

This course is an introduction to differential and integral calculus. It includes limits, continuity, differentiation and integration of algebraic, trigonometric, logarithmic, exponential and other transcendental functions. Some applications are also included. (CAN MATH 18) (MATH SEQ B) AA/AS area 3D and 4C; CSU area B3; IGETC area 2

MATH 401 Calculus II 5 Units

Prerequisite: MATH 400 with a grade of "C" or better.

Course Transferable to UC/CSU

Hours: 90 hours LEC

This course is a continuation of MATH 400. Its content will include techniques of integration, improper integrals, indeterminate forms, applications of integration, infinite series, parametric equations and polar coordinates. (CAN MATH 20) (MATH SEQ B) AA/AS area 4C; CSU area B3; IGETC area 2

MATH 402 Calculus III 5 Units

Prerequisite: MATH 401 with a grade of "C" or better.

Course Transferable to UC/CSU

Hours: 90 hours LEC

This course is a continuation of MATH 401. It includes calculus of functions of more than one variable, partial derivatives, extreme of functions of more than one variable, multiple integration, development of the vector calculus, line integrals, three dimensional analytic geometry and the theorems of Green, Gauss (Divergence), and Stokes. (CAN MATH 22) (MATH SEQ C) AA/AS area 4C; CSU area B3; IGETC area 2

MATH 410 Introduction to Linear Algebra 3 Units

Formerly: MATH 35

Prerequisite: MATH 400 with a grade of "C" or better.

Advisory: MATH 402.

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course provides an introduction to linear algebra including matrices, determinants, vector spaces, linear transformations, eigenvectors. It is intended for majors in mathematics, engineering, economics, science and related fields. (CAN MATH 26) AA/AS area 4C; CSU area B3; IGETC area 2.

MATH 420 Differential Equations 4 Units

Formerly: MATH 9D

Prerequisite: Mathematics 401 with a grade of "C" or better.

Advisory: MATH 402.

Course Transferable to UC/CSU

Hours: 72 hours LEC

This course is a study of ordinary differential equations with emphasis on linear equations and systems of linear equations. It includes infinite series and, Laplace transform and matrix methods of solution. It stresses applications to engineering problems. It is recommended for electrical, mechanical, industrial, ceramic, and petroleum engineers, and for mathematics and physical science majors. (CAN MATH 24) AA/AS area 4C; CSU area B3; IGETC area 2.

MATH 481 Honors Applications of Calculus 1 Unit

Formerly: MATH 8H

Prerequisite: Cumulative GPA of 3.0 or better; MATH 402 with a grade of "C" or better, and ENGWR 300 or 480 with a grade of "C" or better.

Course Transferable to UC/CSU

Hours: 18 hours LEC

This course focuses on professional applications of mathematics in such fields as biomathematics, economics, political science, computer science, earth science, social sciences and psychology. AA/AS area 4C

MATH 100 Individualized Mathematics 3-5 Units

Prerequisite: None

Advisory: Determine or confirm placement using ARC's Math Self-Assessment System.

Hours: 90 hours LEC

This program is an open-entry/open-exit, independent study approach for students wishing to take MATH 32 (Prealgebra, 3 units), MATH 100 (Elementary Algebra, 5 units), or MATH 120 (Intermediate Algebra, 5 units). During the first class meeting, students choose the specific course in which to enroll. For students who do not have a prerequisite, course placement should be determined by ARC's on-line self-assessment system. Students who complete one course may advance immediately to the next one. Students may choose to complete a course in one semester (or less), or take up to two semesters. Unit credit is only awarded for the semester in which the course is completed. Students who receive a notation of ;In Progress; must register in the same individualized course the following semester in order to complete the course and receive full unit credit. Computer-based instruction is an integral component. Work may be done on campus (computers available) or off campus (software runs on PC Windows or Macintosh w/virtual PC software).

Statistics

STAT 301 Introduction to Probability and Statistics 3 Units

Formerly: STAT 1

Prerequisite: MATH 120 with a grade of "C" or better.

Advisory: ENGRD 116.

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course will introduce basic concepts of probability and statistics. It will include analysis of data, probability, distributions, tests of hypothesis, estimation, regression and correlation, and analysis of variance. Related application to psychology, social science, natural science, business and engineering will be explored. A scientific calculator that has a stat package (2-variable) is used throughout the course. (CAN STAT 2) AA/AS area 3D and 4C; CSU area B3; IGETC area 2.

STAT 481 Introduction to Probability and Statistics - Honors 3 Units

Formerly: STAT 1H

Prerequisite: Cumulative GPA of 3.0 or better; MATH 120 with a grade of "C" or better, and ENGWR 300 or 480 with a grade of "C" or better.

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course is an introduction to the concepts of statistics with a strong emphasis on the understanding and appreciation of the role of statistics in real life situations including computer analysis of real data. In addition to the topics presented in STAT 301, this honors course will include either additional topics of non-parametric statistics, design-of-experiment issues ensuring validity, analysis of variance and multiple regression or an applied research term paper using statistical methods and data collected from a work environment. AA/AS area 3D & 4C; CSU area B3; IGETC area 2.