

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

MATHEMATICS 080 – FOUNDATIONS FOR CALCULUS & ANALYTIC GEOMETRY I

2 hours lecture, 2 units

Catalog Description

Support for this course focuses on the skills and concepts needed for success in *Calculus and Analytic Geometry I*. This course is for students concurrently enrolled in Calculus I (Math 180) at Cuyamaca College. Students will receive extra support in algebra, analytic geometry, trigonometry, technology, and study skills. **Pass/No Pass only. Non-degree applicable.**

Prerequisite

Appropriate placement

Co-requisite

MATH 180

Course Content

A just-in-time approach to content relevant to the Math 180 entrance skills and to success in Math 180:

- 1) Algebra
 - a. Domain and range
 - b. Methods for solving equations involving polynomials, logarithms, exponents, absolute value, and/or radicals
 - c. Function composition
 - d. Properties of rational exponents
 - e. Properties of real numbers
- 2) Trigonometry
 - a. Identities and formulas
 - b. Standard angles
 - c. Converting between radian and degree measure
 - d. Solving trigonometric equations
- 3) Geometry
 - a. Analytic geometry
 - b. Formulas for standard geometric objects
 - c. Similarity
- 4) Mathematical Reasoning
 - a. Recognizing mathematical arguments
 - b. Modeling
- 5) Graphing
 - a. Functions and their inverses
 - b. Graph interpretation
- 6) Study Skills
 - a. Affective domain
 - b. Use of relevant technology
 - c. Test-taking strategies
 - d. Reading and note-taking strategies

Course Objectives

Students will be able to

- 1) Use skills and knowledge from algebra, geometry, trigonometry to successfully complete Calculus I, Math 180, problems.
- 2) Apply problem solving skills and gain confidence working Calculus I problems from Math 180.
- 3) Assess and improve their mathematical competency.
- 4) Apply effective study skills.

Method of Evaluation

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.

- 1) Group and independent exploratory activities which measure students' ability to analyze the connections between the numeric, algebraic, and verbal representations of various types of algebraic expressions, equations, inequalities, functions, and systems of equations and/or inequalities when applied to real-world problems and data analysis.
- 2) Quizzes and exams (including a comprehensive in-class final exam) which measure students' ability to work independently using graphic, numeric, and algebraic techniques to simplify algebraic expressions; formulate, analyze and solve algebraic equations, inequalities, and systems of equations and inequalities; identify and analyze algebraic, exponential, and logarithmic functions; apply formulas to evaluate geometric objects; use all of the above in solving real-world application problems; and recognize and graph elementary conics.
- 3) Homework in which students apply graphic, numeric and algebraic principles discussed in class to a series of practice problems to help them formulate questions and receive feedback from the instructor, tutors, or classmates.
- 4) Computer laboratory assignments in which students apply algebraic principles and problem-solving techniques discussed in class to help students identify gaps in their skill attainment and concept mastery and to improve their symbolic manipulation abilities and problem-solving skills.

Special Materials Required of Student

Graphing calculator

Minimum Instructional Facilities

- 1) Smart classroom with white boards, overhead projector/screen, graphing utility overhead viewing panels
- 2) Math lab with computers, white boards, overhead projector/screen, appropriate software for integrated computer instruction (word processing, spreadsheet and other workplace software)

Method of Instruction

- 1) Lecture and discussion
- 2) Teamwork
- 3) Instructor-guided discovery and computer-facilitated instruction

Out-of-Class Assignments

- 1) Problem sets
- 2) Exploratory activities and/or projects
- 3) Reading and/or writing assignments

Texts and References

- 1) Required (representative example): None
- 2) Supplemental: Interactive Math on Canvas course with exploratory projects and classroom activities created by Cuyamaca College faculty

Exit Skills

Students who successfully complete this course will exit with the following skills, competencies and/or knowledge:

- 1) Appropriate use of PreCalculus vocabulary and concepts in service of Calculus
 - a. Domain and range
 - b. Graphs and properties of algebraic, exponential, logarithmic, and trigonometric functions
 - c. Operations with functions, including composition, inverses and identities
- 2) Familiarity with graphical, symbolic and technology-based methods for solving equations as part of solving Calculus I problems

Student Learning Outcomes

Upon successful completion of this course, students will be able to:

- 1) Use the analytical, numerical, and graphical methods of PreCalculus in solving Calculus I problems.
- 2) Solve multi-disciplinary application problems and interpret the results in context.
- 3) Apply study habits that promote success in Calculus I.