

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

Mathematics 078 – Foundations for Calculus for Business Social & Behavioral Sciences

2 hours lecture, 2 units

Catalog Description

Support for this course focuses on the skills and concepts needed for success in Calculus for Business, Social & Behavioral Sciences (Math 178). This course is for students concurrently enrolled in Math 178 at Cuyamaca College. Students will receive extra support in algebra, geometry, problem solving, technology, and study skills. **Pass/No Pass only. Non-degree applicable.**

Prerequisite

Appropriate placement

Co-requisite

MATH 178

Course Content

A just-in-time approach to:

- 1) Algebra skills
 - a. Factoring
 - b. Solving equations and inequalities
 - c. Simplifying expressions
 - d. Exponents
 - e. Functions
 - f. Graphing
- 2) Geometry skills
 - a. Right triangles
 - b. Area/perimeter/volume
 - c. Rectangles
- 3) Problem solving skills
 - a. Reading strategies for comprehension
 - b. Categorizing information
 - c. Writing equations: translating words into equations
 - d. Interpreting results
- 4) Study skills
 - a. Affective domain
 - b. Test taking strategies
 - c. Reading a textbook for comprehension
 - d. Note taking
- 5) Technology skills
 - a. Graphing calculator
 - b. On-line learning management systems (on-line homework, Canvas, etc.)

Course Objectives

Students will be able to:

- 1) Practice specific skills from algebra, geometry, and technological skills needed to complete Calculus for Business, Social & Behavioral Sciences;
- 2) Develop problem solving skills and gain confidence working with problems at the applied Calculus level;
- 3) Assess and improve their mathematical competency;
- 4) Use 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) Independent exploration 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; use all of the above in solving real-world application problems.
- 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 utility

Minimum Instructional Facilities

Smart classroom with writing boards covering three walls, overhead projector, graphing utility overhead viewing panels

Method of Instruction

- 1) Lecture and discussion
- 2) Teamwork
- 3) Computer-facilitated instruction

Out-of-Class Assignments

- 1) **Reading:** Lecture notes; assigned textbook sections explaining mathematical concepts and procedures; instructional materials provided by the instructor; worked example sets; reference materials for mathematical symbols and notation; supplemental explanations from approved online resources; and documentation for graphing calculators or mathematical software.
- 2) **Writing / Problem Solving:** Problem sets requiring clear, step-by-step demonstration of reasoning using correct mathematical notation; written explanations supporting solutions and justifying methods; error analysis and revision of incorrect or incomplete work; solution summaries explaining conceptual understanding; problem-based learning tasks requiring application of multiple skills; written responses to mathematical prompts or inquiry problems; and organized documentation of problem-solving strategies used in individual or group assignments.

- 3) **Other:** Online homework assignments or quizzes using learning platforms; collaborative problem solving using shared documents or discussion boards; graph construction by hand and with technology; review and annotation of instructor feedback to revise and resubmit work; preparation for exams through practice tests and concept reviews; mathematical modeling activities using real-world data; use of graphing calculators or math software to explore and verify solutions; and completion of study logs, learning reflections, or structured practice plans to build mastery.

Texts and References

- 1) Required (representative example): None
- 2) Supplemental: Exploratory projects and classroom activities created by Cuyamaca College faculty

Exit Skills

Students having successfully completed this course exit with the following skills, competencies and/or knowledge:

- 1) Operations, simplification, and manipulation of various mathematical structures, including: polynomials, rational expressions, complex numbers, logarithms, variables with rational exponents, and radical expressions
- 2) Solving equations of various types, including: linear, quadratic, factorable polynomials, rational, logarithmic, exponential, radical, absolute value, and linear systems.
- 3) Graphing relations, functions and their inverses, and conic sections.
- 4) Modeling applications using functions and applying problem solving strategies and techniques.

Student Learning Outcomes

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

- 1) Solve multi-disciplinary application problems and interpret the results in context
- 2) Demonstrate relevant arithmetic, algebra, and technology skills in the context of Calculus for Business, Social & Behavioral Sciences
- 3) Apply study habits that promote success in Calculus for Business, Social & Behavioral Sciences