

COCONINO COMMUNITY COLLEGE
COURSE OUTLINE

Reviewed by: Philip Martinez
Status: Permanent

Spring 2017

A. Identification:

1. Subject Area: Math (MAT)
2. Course Number: MAT 220 SUN # MAT 2220
3. Course Title: Calculus and Analytic Geometry I
4. Credit Hours: 5
5. Course Description: Limits, continuity, differential and integral operations on algebraic and trigonometric functions, and applications. General Education: Mathematics. Prerequisite: *MAT 187 or placement. Five lecture.

- B. Course Goals: To develop a fundamental understanding within the student of the concepts of differentiation and integration. These concepts will be analyzed verbally, numerically, graphically, and analytically to establish essential problem solving skills and a positive attitude toward mathematics.
General Education Curriculum: Mathematics

C. Course Outcomes

Upon successful completion of this course, students will:

1. review pre-calculus topics including solving and graphing polynomial, rational, logarithmic, exponential, and trigonometric functions;
2. interpret and solve growth and decay application problems;
3. analyze and evaluate limits;
4. analyze and interpret the concept of continuity of functions;
5. analyze the concept of the derivative verbally, numerically, and analytically;
6. calculate derivatives of polynomial, rational, logarithmic, exponential, and trigonometric functions;
7. calculate derivatives of the products, ratios, and composition of functions;
8. interpret and solve applied problems using the derivative;
9. analyze, interpret, and apply the Mean Value Theorem;
10. define and evaluate right and left hand Reiman sums;
11. analyze the concept of the integral verbally, numerically, graphically, and analytically;
12. calculate integrals of basic polynomial, rational, logarithmic, exponential, and trigonometric functions;
13. calculate integrals of basic products, ratios, and composite functions using substitution.

- D. Course Assessment will include a comprehensive final exam.

E. Course Content will include:

1. Function Review
 - a. Polynomial
 - b. Rational
 - c. Logarithmic
 - d. Exponential
 - e. Trigonometric
2. Limits

- a. Definition
 - b. Calculation
 - c. Application
3. Rates of Change and Derivative
 - a. Numerical interpretation
 - b. Graphical interpretation
 - c. Analytic interpretation
 4. Calculating Derivatives
 - a. Basic functions
 - b. Product Rule
 - c. Quotient Rule
 - d. Chain Rule
 - e. Applications
 5. Mean Value Theorem
 - a. Definition
 - b. Application
 6. Reiman Sums
 - a. Definition
 - b. Application
 7. The Definite Integral
 - a. Numerical interpretation
 - b. Graphical interpretation
 - c. Analytic interpretation
 8. The Fundamental Theorem of Calculus
 - a. Evaluating Definite and Indefinite Integrals
 1. Basic Functions
 2. Products, ratios and composition of functions

*Course has additional pre or co-requisite(s)