

PALOMAR COLLEGE
COURSE OUTLINE OF RECORD FOR
DEGREE CREDIT COURSE

 X Transfer course X A.A. degree applicable course

COURSE NUMBER AND TITLE: Math 140 - Calculus with Analytic Geometry,
First Course

UNIT VALUE: 5

MINIMUM NUMBER OF SEMESTER HOURS: 80

BASIC SKILLS REQUIREMENTS: Appropriate language and computational skills.

ENTRANCE REQUIREMENTS:

PREREQUISITE: A minimum grade of "C" in Math 135, or Math 110 and Math 115, or eligibility determined through the math placement process.

COREQUISITE: None

RECOMMENDED PREPARATION: None

SCOPE OF COURSE: An introduction to analytic geometry, differentiation and integration of algebraic and transcendental functions of a single variable, and applications of differentiation.

SPECIFIC COURSE OBJECTIVES: Successful students will be able to:

1. Differentiate elementary algebraic and transcendental functions of a single variable.
2. Integrate selected elementary and transcendental functions of a single variable.
3. Analyze the behavior of functions using the tools of calculus.
4. Formulate and solve optimization and related rate application problems using graphical, numerical, and analytical methods.
5. Apply critical thinking skills by explaining and presenting their problem-solving results and conclusions in a coherent written mathematical format.

CONTENT IN TERMS OF SPECIFIC BODY OF KNOWLEDGE: At least the following topics will be covered:

- I. Limits and their Properties:
 - a. Concept of limit

- b. Techniques for evaluating limits (graphical, numerical, and analytical)
- c. Limit applications
- II. Differentiation:
 - a. Definition of derivative
 - b. Differentiation rules for algebraic and transcendental functions
 - c. The Chain Rule
 - d. Implicit differentiation
- III. Applications of Differentiation:
 - a. Extrema on an interval
 - b. Rolle's Theorem and the Mean Value Theorem
 - c. First and second derivative tests
 - d. Increasing/decreasing functions
 - e. Concavity
 - f. Analyzing graphs of functions
 - g. Related rates
 - h. Optimization problems
 - i. Differentials
- IV. Integration:
 - a. Antiderivatives
 - b. Riemann sums and the definite integral
 - c. The Fundamental Theorem of Calculus
 - d. Integration by substitution
 - e. Numerical integration
- V. Additional topics may be included at instructor's discretion.

REQUIRED READING:

Larson, Roland E., Robert P. Hostetler, and Bruce H. Edwards. Calculus with Analytic Geometry, 6th Edition. Lexington: Houghton Mifflin and Company, 1998.

OR

Stewart, James. Single Variable Calculus, 4th Ed. Pacific Grove: Brooks/Cole, 1999.

OR

Any other text approved by the department.

SUGGESTED READING: None

REQUIRED WRITING:

Problem-solving exercises on homework assignments and written tests are more appropriate. In addition, students may be required to write reports from one paragraph to several pages explaining concepts or explaining and interpreting solutions to non-routine or applied problems.

OUTSIDE ASSIGNMENTS:

Students are expected to spend a minimum of three hours per unit per week in class and on outside assignments, prorated for short term classes.

Students are expected to read the text, study lecture notes, and complete daily homework assignments. Homework assignments may include practice solving routine problems, explaining concepts, and solving application or non-routine problems. Other outside assignments may include computer laboratory assignments, problem-solving reports or journals.

INSTRUCTIONAL METHODOLOGY:

Check all that apply:

- lecture
- laboratory
- lecture-laboratory combination
- directed study

This course may be offered as a distance education course and meets Title 5 regulations 55370, 55372, 55374, 55376, 55378, and 55380.

Yes No

If yes, check all that apply. (See guidelines for preparation for definitions.)

- telecourse
- mediated instruction
- computer assisted instruction

GRADING POLICY AND STANDARDS (include methods of determining whether the stated objectives have been met by students):

Computation of semester grade may include the following methods of evaluation: In-class exams, take-home exams, computer lab assignments, homework assignments, essays, or other evaluation methods. A comprehensive final exam (in class) is required. For example, the semester grade may be computed as follows:

Written exams	40 - 80%
Comprehensive final	20 - 40%
Homework or other outside assignments	0 - 20%

IS COURSE REPEATABLE FOR REASON(S) OTHER THAN DEFICIENT GRADE?

Yes No Number of times course may be taken for credit: 1

If yes, identify specific provision of Title 5 Division 2 section(s) 55761-55763 and 58161 which qualifies course as repeatable:

CONTACT PERSON: Robert Jones **EXTENSION:** 2547

SIGNATURES ON FILE