

PALOMAR COLLEGE
COURSE OUTLINE OF RECORD FOR
DEGREE CREDIT COURSE

 X Transfer course X A.A. degree applicable course
(check all that apply)

COURSE NUMBER AND TITLE: Math 135 – Precalculus Mathematics

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 115 or appropriate score on Placement Test.

COREQUISITE: None

RECOMMENDED PREPARATION: None

SCOPE OF COURSE: Designed for students who intend to take calculus. Emphasizes study of the behavior and characteristics of functions from graphic, numerical, analytic, and applied perspectives. Includes trigonometric functions, general polynomial functions, rational functions, exponential functions, logarithmic functions, absolute value functions, functions with rational exponents, and sequences. Selected topics from analytic geometry and linear systems are also presented.

SPECIFIC COURSE OBJECTIVES: The successful student will be able to:

1. Analyze the behavior of a function given a numerical, graphic, or analytic representation.
2. Conceptualize and apply the notion of average rate of change for functions.
3. Analyze, solve, and interpret solutions to trigonometric equations.
4. Analyze, solve, and interpret solutions to problems involving systems of equations in several variables.
5. Identify and apply principles of algebraic manipulations necessary to simplify algebraic expressions and to solve problems that are represented algebraically.
6. Use knowledge of different functions and strategies to develop solutions for a variety of realistic application problems.
7. Use trigonometric functions to develop solutions to realistic application problems and interpret the results in the context of the problem.
8. Select and employ appropriate graphic, numerical, or analytic methods to solve equations and inequalities, including those involving absolute value, polynomial expressions, expressions with rational and negative exponents, and rational expressions.
9. Apply critical thinking and quantitative reasoning skills to mathematical problem solving.

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

1. Function analysis from graphic, numerical, and analytic perspectives to include the following:
 - Domain
 - Range
 - Increasing, decreasing, constant intervals
 - Extreme behavior
 - Real and Complex zeros

- Asymptotes
- Inverses
- Discontinuities
- Difference quotients
- 2. Analyze and interpret the effects of transformations on functions and relations, including conic sections
- 3. Average rate of change
- 4. Trigonometry
 - Circular definition
 - Radian Measure
 - Applications
 - Identities
 - Trigonometric equations
 - Trigonometric form of complex numbers (Optional)
 - Polar coordinates (optional)
 - DeMoivre's Theorem and n^{th} roots of complex numbers (optional)
- 5. Graphing
 - Algebraic Functions and Relations
 - Trigonometric Functions
 - Exponential and Logarithmic Functions
- 6. Analyze sequences and series as discrete functions including discussion of arithmetic and geometric sequences and series, partial sums, and the Binomial Theorem
- 7. Rewrite polynomial, rational, absolute value, negative and/or rational exponents, exponential and logarithmic expressions in order to solve equations and inequalities and to analyze the behavior of functions
- 8. Solve and interpret solutions of linear systems of equations of several variables using matrices, including discussion of augmented matrices and row operations, inverse matrices, and determinants
- 9. Mathematical induction (optional)
- 10. Parametric equations (optional)
- 11. Additional topics may be included at instructor's discretion

REQUIRED READING:

Cohen, David. Precalculus with Unit-circle Trigonometry. Pacific Grove:Brooks/Cole, 1998.

OR

Aufmann, Richard, Vernon Barker, and Richard Nation. Precalculus. Boston: Houghton Mifflin, 2nd Ed.

OR

Larson, Roland E., Robert P. Hostetler, and Bruce H. Edwards. Precalculus Functions and Graphs: A Graphing Approach. Lexington: D.C. Heath and Company, 2nd Ed..

OR

Larson, Hostetler. Precalculus. Boston: Houghton Mifflin, 2001.

OR

Other comparable textbook.

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 learning course and meets Title 5 regulations 55370, 55372, 55374, 55376, 55378, and 55380.

Yes No

If yes, check all that apply.

- Television Course (Video one-way, e.g. ITV, video cassette, etc.)
- Online Course (Text one-way, e.g. newspaper, correspondence, electronic file, etc.)
- Two-Way Video Conferencing (Two-way interactive video and audio)
- One-Way Video Conferencing (One-way interactive video and two-way interactive audio)
- Computer Assisted Instruction (A specialized form of mediated instruction relying primarily on student access to information and prepared lessons or teaching materials through a computer terminal, but not under immediate supervision of a qualified instructor.)

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: Mathews Chakkanakuzhi

Ext: 2541

SIGNATURES:

SIGNATURES ON FILE