

**IMPERIAL COMMUNITY COLLEGE DISTRICT
IMPERIAL VALLEY COLLEGE**

COURSE OUTLINE

DIVISION: Science, Mathematics and Engineering

DATE: September 2006

COURSE TITLE: Pre-Calculus

COURSE NO.: MATH 190 **UNITS:** 5

LEC HRS. 5 **LAB HRS.** _____ **HRS. TBA**

If cross-referenced, please complete the following

COURSE NO.(s) _____ **COURSE TITLE**

I. COURSE/CATALOG DESCRIPTION:

This is a course intended for students who need a thorough foundation before attempting calculus. It will include the study of the real number system, exponential, logarithmic, and trigonometric functions, the complex numbers, theory of equations, and systems of equations.

II. A. PREREQUISITES, if any:

MATH 140 or equivalent with a grade of "C" or better, or appropriate placement.

B. COREQUISITES, if any:

C. RECOMMENDED PREPARATION, if any:

III. GRADING CRITERIA:

 X Course must be taken on a "letter-grade" basis only.

_____ Course may be taken on a "credit" basis or for a letter grade.

_____ Course must be taken on a "credit" basis only.

IV. MEASURABLE COURSE OBJECTIVES AND MINIMUM STANDARDS FOR GRADE OF "C":

1. The student will demonstrate an understanding and comprehension of real numbers and graphs.
2. The student will demonstrate a solid, but basic knowledge of the general concepts of functions.
3. The student will demonstrate the ability to work with polynomial and rational functions in the complex number system.
4. The student will demonstrate a working knowledge of exponential and logarithmic functions.
5. The student will demonstrate a strong foundation in the introduction to trigonometry.
6. The student will demonstrate knowledge in the formulation of analytic trigonometry.
7. The student will demonstrate the numerous and diverse applications of trigonometry prevalent in a wide range of scientific fields.
8. The student will demonstrate the ability to solve linear systems of equations and inequalities and will familiarize themselves with matrices and determinants.

V. CORE CONTENT TO BE COVERED IN ALL SECTIONS:

CORE CONTENT	APPROX. % OF COURSE
1. Real numbers and graphs A. Real numbers B. Algebraic expressions C. Equations and inequalities D. Rectangular coordinate systems E. Lines	10%
2. Functions A. Definition of function B. Graphs of functions C. Quadratic functions D. Operations of functions E. Inverse functions	15%
3. Polynomial and rational functions A. Graphs and polynomial functions B. Division of polynomials C. Complex numbers D. Zeros of polynomials E. Complex and rational zeros of polynomials F. Rational functions	10%
4. Exponential and logarithmic functions A. Exponential functions B. The natural exponential function C. Logarithmic functions D. Graphs of logarithmic functions E. Common and natural logarithms F. Exponential and Logarithmic equations	15%
5. The trigonometric functions A. Angles B. Trigonometric functions of angles C. Trigonometric functions of real numbers D. Values of the trigonometric functions E. Trigonometric graphs F. Additional trigonometric graphs G. Applications involving right triangles H. Harmonic motion	15%
6. Analytic trigonometry A. Trigonometric identities B. Trigonometric equations C. The addition and subtraction formulas D. Multiple-angle formulas E. Product-to-sum and sum-to-product formulas F. The inverse trigonometric functions	15%
7. Application of trigonometry A. The Law of Sines B. The Law of Cosines C. Trigonometric form for complex numbers D. DeMoivre's Theorem and the nth Roots of Complex Numbers E. Vectors F. The Dot Product	10%
8. Systems of equations and inequalities A. Systems of equations B. Systems of Linear equations in two variables C. Systems of Linear equations in more than two variables D. Partial fractions E. Operations on Matrices F. Determinants G. Properties of determinants H. Systems of inequalities I. Linear programming	10%

VI. METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS: (check all that apply)

Essay	<u> X </u>	Class Activity	<u> X </u>	Written Assignments	<u> X </u>
Problem Solving Exercise	<u> X </u>	Final Exam	<u> X </u>	Oral Assignments	<u> X </u>
Skill Demonstration	<u> X </u>	Objective	<u> X </u>	Quizzes	<u> X </u>
Other	<u> X </u>				

VII. INSTRUCTIONAL METHODOLOGY: (Check all that apply)

Lecture	<u> X </u>	Discussion	<u> X </u>	Demonstration	<u> X </u>
Audio Visual	<u> X </u>	Group Activity	<u> X </u>	Lab Activity	<u> X </u>
Computer Assisted Instruction	<u> X </u>	Individual Simulation/ Assistance	<u> X </u>	Case Study	<u> X </u>
On-Line	<u> X </u>				

Two (2) hours of independent work done out of class per each hour of lecture or class work, or 3 hours lab, practicum, or the equivalent per unit.

Other

VIII. TEXTBOOK(S) AND SUPPLEMENT(S):

Dugopolski, Mark. *Precalculus, Functions and Graphs*. 2nd edition. Addison Wesley, 2005.

Stewart, J., Redlin, L. and Watson, S. *Precalculus, Mathematics for Calculus*. 5th edition. Belmont, CA: Thomson Brooks/Cole, 2006.

Sullivan, Michael. *Precalculus*. 7th edition. Prentice Hall, 2005.

Larson, R. and Hostetler R.. *Precalculus*. 6th edition. Houghton Mifflin, 2004.

Lial, M., Hornsby, J. and Shneider, D. *Precalculus*. 3rd edition. Addison Wesley, 2005.