Administrative Unit: Computer and Mathematical Sciences Department
Course Prefix and Number: MATH 180
Course Title: Precalculus
Number of Credit Hours: 3
Lecture Hours: 3
Laboratory Hours: 0
Catalog Description: Precalculus is a preparatory course for Calculus and covers the following topics: algebraic, exponential, logarithmic, trigonometric, and inverse trigonometric functions, trigonometric equations and trigonometric identities. Prerequisites: Grade of C or higher in MATH 150, or a score of 23 or higher on the Math Portion of the ACT. Offered Spring. G.E.

Prerequisite(s)/Corequisite(s): Grade of C or higher in MATH 150, or a score of 23 or higher on the Math Portion of the ACT.

Blitzer, R. *Precalculus.* Prentice Hall.

Course Objectives:
- To demonstrate fundamental technical skills and clear understanding of the basic concepts of algebraic and transcendental functions.
- To solve real-world problems using algebraic and transcendental functions.
- To identify connections between mathematics and other disciplines.
- To use appropriate technology to enhance their mathematical understanding and to solve real-world problems.

Measurable Learning Outcomes:
- Determine if a relation is a function.
- Identify the domain and range of a function.
- Use the graph of a function to identify characteristics of the function such as symmetry and intervals of increasing, decreasing, and constant behavior.
- Recognize graphs of common functions and graph transformations of these common functions.
- Combine functions arithmetically and through composition and identify the domain of the resulting functions.
- Demonstrate an understanding of the fundamental concepts associated with inverse functions including the definition of one-to-one functions and the graphical interpretation of inverses.
- Define, evaluate, and graph trigonometric functions from both the real-number and angle perspectives.
- Define, evaluate, and graph-inverse trigonometric functions.
- Solve applied problems using trigonometric and
inverse trigonometric functions.

- Use the Law of Sines and the Law of Cosines to compute angle measures and side lengths of triangles.
- Prove trigonometric identities using the addition formulas, double-angle formulas, and half-angle formulas for the sine, cosine, and tangent functions.
- Simplify trigonometric expressions.
- Solve equations which contain trigonometric expressions.
- Simplify exponential and logarithmic expressions and solve exponential and logarithmic equations.
- Solve applied problems using exponential and logarithmic functions.

**Topical Outline (major areas of coverage):**

- Basic Concepts of Functions
- Trigonometric Functions
- Inverse Trigonometric Functions
- Trigonometric Identities
- Exponential and Logarithmic Functions

**Recommended maximum class size for this course:** 30

**Library Resources:**

Online databases are available at [http://www.ccis.edu/offices/library/resources.asp](http://www.ccis.edu/offices/library/resources.asp). You may access them from off-campus using your eServices login and password when prompted.

**Prepared by:** Natasha Latushkina

**Date:** March 8, 2006

**NOTE:** The intention of the master syllabus is to provide an outline of the contents of this course, as specified by the faculty of Columbia College, regardless of who teaches the course, when it is taught or where it is taught. Faculty members teaching this course for Columbia College are expected to facilitate learning pursuant to the course objectives and cover the subjects listed in the topical outline. However, instructors are also encouraged to cover additional topics of interest so long as those topics are relevant to the course’s subject. The master syllabus is, therefore, prescriptive in nature but also allows for a diversity of individual approaches to course material.

Office of Academic Affairs
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