Precalculus Syllabus, **Math 140** Spring 2010

Text

James Stewart, Lothar Redlin, Saleem Watson,
Precalculus, fifth edition, Mathematics for Calculus

Prerequisites

Two years of high school algebra, one year of plane geometry, passage of the assessment exam.

Chapters and sections covered

Note: There are 30 hours of lectures but 38 sections. Some sections must be combined into one hour. The first three (1.7, 1.8, 1.10) can be combined into one hour. So can sections 2.2 and 2.3. So can sections 3.2 and 3.3.

Chapter 1. Fundamentals
- 1.7 Inequalities
- 1.8 Coordinate Geometry
- 1.10 Lines

Chapter 2. Functions
- 2.2 Graphs of Functions
- 2.3 Increasing and Decreasing Functions
- 2.4 Transformations of Functions
- 2.5 Quadratic Functions; Maxima and Minima
- 2.6 Modeling with Functions
- 2.7 Combining Functions
- 2.8 One-to-One Functions and their Inverses

Chapter 3. Polynomial and Rational Functions
- 3.1 Polynomial Functions and their Graphs
- 3.2 Dividing Polynomials
- 3.3 Real Zeros of Polynomials
- 3.6 Rational Functions

Chapter 4. Exponential and Logarithmic Functions
- 4.1 Exponential Functions
- 4.2 Logarithmic Functions
- 4.3 Laws of Logarithms
- 4.4 Exponential and Logarithmic Equations
- 4.5 Modeling with Exponential and Logarithmic Functions

Chapter 5. Trigonometric Functions of Real Numbers
- 5.1 The Unit Circle
- 5.2 Trigonometric Functions of Real Numbers
- 5.3 Trigonometric Graphs
- 5.4 More Trigonometric Graphs
- 5.5 Modeling Harmonic Motion

Chapter 6. Trigonometric Functions of Angles
- 6.1 Angle Measure
- 6.2 Trigonometry of Right Triangles
- 6.3 Trigonometry Functions of Angles
- 6.4 The Law of Sines
- 6.5 The Law of Cosines

Chapter 7. Analytic Trigonometry
- 7.1 Trigonometry Identities
- 7.2 Addition and Subtraction Formulas
- 7.3 Double-Angle, Half-Angle, and Sum-Product Formulas
- 7.4 Inverse Trigonometric Functions
- 7.5 Trigonometric Equations

Chapter 8. Polar Coordinates and Vectors
- 8.1 Polar Coordinates

Chapter 10. Analytic Geometry
- 10.1 Parabolas
- 10.2 Ellipses
- 10.3 Hyperbolas

Course Objectives and Student Learning Outcomes

Upon successful completion of Math 140, the student will be able to work with, apply, and answer questions pertaining to the material in the list of topics at the level of a standard precalculus test.

Program Objectives

The successful student will acquire the skills prerequisite for calculus.