



MAT1113H SYLLABUS HONORS PRECALCULUS

COURSE DESCRIPTION

MAT1113H is a foundation course designed to prepare students for success in calculus. It is an *enriched* version of MAT1113. The course includes a study of polynomial, rational, and transcendental functions and their applications as well as conic sections, polar coordinates, parametric equations, and mathematical induction.

PREREQUISITES

Admission to the Honors Program and either MAT1112 or a strong background in high school mathematics with a Mathematics SAT score of 549 or greater.

TEXTBOOK

"Precalculus with Unit-Circle Trigonometry," 3rd Edition by Cohen, Brooks / Cole, 1998.

INCORPORATION OF TECHNOLOGY

Computer software or graphing calculators will be considered appropriate students tools for finding solutions to applications. The computer or graphing calculator will be used to demonstrate mathematical concepts in the classroom as deemed appropriate by the instructor.

APPROXIMATE TIMELINE (Not including testing)

Approximate timelines are based on a class meeting 50 minutes per day for 45 days:

<u>Text</u>	<u>Optional Material</u>	<u>Days</u>
Chapters 1-2, Section 12.1		4 (review)
Chapter 3	Iteration in 3.4	5 (one section per day)
Chapter 4	4.3	5
Chapter 5	Inequalities in 5.5	5
Chapter 6		5 (one section per day)
Chapter 7		5 (one section per day)
Sections 8.1, 8.2, 8.4, 8.5		4 (one section per day)
Sections 9.1-9.2, 9.5-9.6		4 (one section per day)
Sections 11.2, 11.4, 11.5		2
Section 13.1		1

TOPICS COVERED

Upon completion of the course, the student should be able to:

- Understand real and complex numbers.
- Simplify algebraic expressions (including the difference quotient).
- Understand the concept of a function and find the domain and range of a function.
- Solve equations with one variable and evaluate functions with one variable for the following types of functions and equations: linear, quadratic, polynomial, absolute value, rational, radical, exponential, logarithmic, and trigonometric (sine, cosine, tangent, cotangent, secant, and cosecant). The trigonometric functions will be evaluated for real numbers and angles measured in radians or degrees.
- Solve various types of inequalities (including linear, absolute value, quadratic, polynomial, and rational).

- Graph lines (linear functions and equations), circles, parabolas, ellipses, hyperbolas, polynomial functions, exponential functions, logarithmic functions, the trigonometric functions, and the inverse trigonometric functions.
- Find composite and inverse functions.
- Solve right triangles using the trigonometric functions as ratios of the sides of the right triangle.
- Understand the Law of Sines and Law of Cosines and be able to apply them.
- Apply fundamental trigonometric identities to prove other identities.
- Understand the inverse trigonometric functions (definitions and values).
- Graph with polar coordinates.
- Graph parametric equations.
- Understand the Principle of Mathematical Induction.
- Solve word problems by creating the appropriate function or equation as a mathematical model of the situation.