

PRECALCULUS

MTH 139

Text: *Algebra & Trigonometry*, Michael Sullivan.

Course Description:

This course will cover the basic concepts that are required for further study of mathematics including a course in calculus. The course topics include solving linear, quadratic, exponential and logarithmic equations; linear and quadratic inequalities; properties and graphs of polynomial, rational, exponential, logarithmic, trigonometric and inverse trigonometric functions; angles; right triangles; trigonometric identities and equations.

Course Objectives:

1. Students will be able to solve quadratic, rational and exponential equations.
2. Students will be able to find equations of lines given certain information about the line.
3. Students will be able to graph polynomial, rational, exponential and logarithmic functions and identify key characteristics of the graph of each type of functions.
4. Students will be able to identify which types of functions are invertible and find inverses of basic functions.
5. Students will be able to solve and graph polynomial and rational inequalities.
6. Students will be able to model situations involving exponential growth or decay.
7. Students will be able to define trigonometric functions in terms of the sides of a right triangle.
8. Students will be able to find values of trigonometric functions of acute angle using right triangles.
9. Students will be able to compute the values of trigonometric functions of general angles.
10. Students will be able to identify key properties of trigonometric functions.
11. Students will be able to graph trigonometric functions.
12. Students will be able to identify the amplitude, period and phase shift of trigonometric functions.
13. Students will be able to identify key trigonometric identities and use these identities to find values of trigonometric functions.
14. Students will be able to calculate the values of inverse trigonometric functions.
15. Students will be able to identify the domains and ranges of the inverse trigonometric and graph these functions.

Grading Policy:

Your grade will be determined by 4 midterm exams, a final exam, attendance and participation.

Midterm Exams	60%
Final Exam	20%
Homework	15%
Attendance & Participation	5%

A final percentage of at least 90% will ensure an A. A final percentage of at least 87% will ensure a B+; a final percentage of at least 80% will ensure a B, etc.

Course Requirements:

1. Midterm Exams:

There will be four midterm exams given during the regular lecture time. There will be roughly one exam every six or seven sections. Each exam will be worth 15% of your final grade. Make-up exams will only be given in extreme cases, and *only* if arrangements are made before the original exam time.

2. Final Exam:

A comprehensive final exam will be given during the final exam period during the last week of the semester. Make-up exams will only be given in extreme cases. Any make-up exam will be scheduled after the original exam period.

3. Homework:

Daily homework assignments will be given. The problems assigned represent the minimum number of exercises you should complete. While homework will not be collected daily, you will have the opportunity to ask questions on the homework at the beginning of class. Homework from the previous week will be collected each week. No late homework assignments will be accepted.

You are permitted and encouraged to work with others, but you are required to write your own solutions with your own words and notation.

4. Attendance & Participation:

Attendance is mandatory. You will be permitted three unexcused absences without penalty to your grade. You are expected to participate in class by answering and asking questions.

Technology:

You will be permitted to use scientific calculators on homework and exams.

Academic Honesty:

All violations of the University Policy on academic honesty will receive a grade of 0 for the assignment and may result in a failing grade for the course. (Multiple violations will be reviewed by the Dean.) The University Policy and College procedures for dealing with violations can be found in the *Undergraduate Bulletin*.

Class Cancellation Policy:

In the event that class is cancelled, a message will be sent through BlueLine. Additionally, the Mathematics Department will be notified, and a sign will be posted in the classroom.

Course Topics:

SECTION	TOPIC
R.5	Factoring Polynomials
R.7	Rational Expressions
R.8	n^{th} Roots; Rational Expressions
1.2	Quadratic Equations
1.5	Solving Inequalities
2.2	Graphs of Equations in Two Variables; Intercepts
2.3	Lines
--	Exam 1
3.1	Functions
3.2	Graphs of Functions
3.3	Properties of Functions
3.4	Library of Functions: Piecewise-defined Functions
3.5	Graphing Techniques: Transformations
4.1	Linear Functions and Their Properties
4.3	Quadratic Functions and Their Properties
4.5	Quadratic Inequalities
--	Exam 2
5.2	Properties of Rational Functions
5.4	Polynomial and Rational Inequalities
6.2	One-to-one Functions; Inverse Functions
6.3	Exponential Functions
6.4	Logarithmic Functions
6.6	Logarithmic and Exponential Equations
6.8	Exponential Growth and Decay Models; Logistic Growth and Decay Models
--	Exam 3
7.1	Angles and Their Measure
7.2	Right Triangle Trigonometry
7.3	Computing the Values of Trigonometric Functions of Acute Angles
7.4	Trigonometric Functions of General Angles
7.5	Unit Circle Approach; Properties of the Trigonometric Functions
7.6	Graphs of the Sine and Cosine Functions
7.7	Graphs of the Tangent, Cotangent, Cosecant and Secant Functions
7.8	Phase Shift; Sinusoidal Curve Fitting
--	Exam 4
8.1	The Inverse Sine, Cosine, and Tangent Functions
8.2	The Inverse Trigonometric Functions (continued)
8.3	Trigonometric Identities
8.4	Sum and Difference Formulas
--	Final Exam