

MAT 171A
PRECALCULUS ALGEBRA LAB

COURSE DESCRIPTION:

Prerequisites: MAT 080 or MAT 090 or satisfactory score on placement test

Corequisites: MAT 171

This course is a laboratory for MAT 171. Emphasis is on experiences that enhance the materials presented in the class. Upon completion, students should be able to solve problems, apply critical thinking, work in teams, and communicate effectively. *This course has been approved to satisfy the Comprehensive Articulation Agreement for the general education core requirement in natural sciences/mathematics.* Students may not receive credit for MAT 161A and MAT 171A. Course Hours Per Week: Lab, 2. Semester Hours Credit, 1.

LEARNING OUTCOMES:

Students will be able to apply algebraic concepts and techniques and utilize appropriate technology to interpret and solve applied problems. Students will display proficiency by demonstrating the following competencies:

- a. Individually devise logical plans of solution for non-routine problems.
- b. Defend the execution of those plans of solution.
- c. Go to sources different from the text for further information related to specified class topics, gather that information, and clearly communicate it to other class members.
- d. Work with diverse groups of students to synthesize group solutions for non-routine problems.
- e. Work within a group to execute and defend group solutions to posed problems.

OUTLINE OF INSTRUCTION

- I. Graphs
 - A. Rectangular Coordinates; Graphing Utilities
 - B. Introduction to Graphing Equations
 - C. Intercepts; Symmetry; Graphing Key Equations
 - D. Solving Equations
 - E. Lines
 - F. Circles

- II. Functions and Their Graphs
 - A. Systems of Linear Equations
 - B. Functions
 - C. The Graph of a Function
 - D. Properties of Functions
 - E. Library of Functions; Piecewise-defined Functions
 - F. Graphing Techniques: Transformations
 - G. Mathematical Models: Building Functions

- III. Linear and Quadratic Functions
 - A. Linear Functions, Their Properties, and Linear Models
 - B. Building Linear Models from Data
 - C. Quadratic Functions and Their Properties

- D. Building Quadratic Models from Verbal Descriptions and from Data
 - E. Inequalities Involving Quadratic Functions
- IV. Polynomial and Rational Functions
- A. Polynomial Functions and Models
 - B. Properties of Rational Functions
 - C. The Graph of a Rational Function
 - D. Polynomial and Rational Inequalities
 - E. The Real Zeros of a Polynomial Function
 - F. Complex Zeros: Fundamental Theorem of Algebra
- V. Exponential and Logarithmic Functions
- A. Composite Functions
 - B. One-to-One Functions; Inverse Functions
 - C. Exponential Functions
 - D. Logarithmic Functions
 - E. Properties of Logarithms
 - F. Logarithmic and Exponential Equations
 - G. Financial Models
 - H. Exponential Growth and Decay Models; Newton's Law; Logistic Growth and Decay Models
 - I. Building Exponential, Logarithmic, and Logistic Models from Data
- VI. Parametric Equations
- A. Plane Curves and Parametric Equations
 - B. Using a Graphing Utility to Graph Curves Defined by Parametric Equations
- VII. Systems of Equations and Inequalities
- A. Systems of Nonlinear Equations
 - B. Systems of Inequalities

REQUIRED TEXTBOOK:

Sullivan, Michael and Michael Sullivan, III. Precalculus Enhanced with Graphing Utilities . 5th Ed. Pearson Education, 2009.

CALCULATOR:

TI-83/84 Graphing Calculator.

STATEMENT FOR STUDENTS WITH DISABILITIES:

Students who require academic accommodations due to any physical, psychological, or learning disability are encouraged to request assistance from a disability services counselor within the first two weeks of class. Likewise, students who potentially require emergency medical attention due to any chronic health condition are encouraged to disclose this information to a disability services counselor within the first two weeks of class. Counselors can be contacted by calling 536-7207, ext. 1413 or by visiting the Student Development Office in the Phail Wynn Jr. Student Services Center, room 1309.