

MATH 1101
Mathematical Modeling (3 hrs.)
Mathematics Department
Valdosta State University

REQUIRED TEXT: College Algebra: In Context: with applications for the managerial, life & social sciences (6th Edition) by Harshbarger and Yocco; access code to MyMathLab also required. (Available through Day-1 in Blazeview.)

CALCULATOR: TI-83, TI-83+, TI-84, or TI-84+ **(REQUIRED)**

COURSE DESCRIPTION: A study of algebraic topics from a modeling perspective using different types of functions including linear, quadratic, polynomial, exponential, and logarithmic. Emphasis is on gathering, presentation, and interpretation of data by using real-world examples as models.

LEARNING OUTCOMES: Upon successful completion of this course, students will be able to:
 (1) represent quantitative relationships from a variety of applications, appropriate mathematical models, and use such models to solve real-world problems;
 (2) extract, express, manipulate, and evaluate quantitative information in algebraic, graphical, numeric, and verbal form; and
 (3) use appropriate technology to manipulate and evaluate quantitative information.

VSU GENERAL EDUCATION OUTCOMES:

(Area A2)

Students will demonstrate mathematical proficiency by analyzing a variety of functions and solving various equations.

(Critical Thinking)

Students will identify, evaluate, and apply appropriate models, concepts, or principles to issues, and they will produce viable solutions or make relevant inferences.

COURSE OUTLINE: (Based on 45 sessions, 3 days per week)

Chapter/Section	Topics	Suggested Days
Calculator * arithmetic, 1.1, 1.2, 1.3, 1.4 * Each instructor will prepare a handout for introduction for basic calculator arithmetic (evaluating expressions with a calculator).	Calculator * arithmetic Functions and models Graphs of functions Linear functions Equations of lines	10 - 12
2.1, 2.2, 2.3, 2.4	Algebraic and graphical solution of linear equations Fitting lines to data points System of linear equations in two variables Solutions of linear inequalities	7 - 8

3.1, 3.2, 3.3, 3.4, 3.5	Quadratic functions; parabolas Solving quadratic equations w/ formula & graphing Power and root functions Piece-wise defined functions and absolute value functions Quadratic and power models	6 - 7
4.4	Additional equations and Inequalities	1 - 2
5.1, 5.2, 5.3, 5.4, 5.5, 5.7	Exponential functions Logarithmic functions Exponential and logarithmic equations Exponential and logarithmic models Exponential functions and investing Logistic and Gompertz functions	5-7
6.1, 6.2, 6.3, 6.5 6.6 (using technology)	Higher-degree polynomial functions Modeling with cubic and quartic functions Solutions of polynomial equations Rational functions and rational equations Polynomial and rational inequalities	4 – 5