

Math 1311: Elementary Mathematical Modeling Course Syllabus

Instructor: Dr. Matthew Caputo

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Section number: 04

Delivery format: face-to-face lecture

Prerequisites: MATH 1300: Fundamentals of Mathematics or a passing score on the test for placement into MATH 1311.

Textbook: Functions and Change, 5th Edition, Crauder, Evans and Noell, Houghton-Mifflin 2010

The information contained in this class outline is an abbreviated description of the course. Additional important information is contained in the departmental policies statement at <http://www.math.uh.edu/~dog/13xxPolicies.doc> and on your instructor's personal webpage. You are responsible for knowing all of this information.

Upon successful completion of this course, students will understand and be able to apply properties of polynomial, rational, exponential, logarithmic, and power functions in modeling simple real-life scenarios from business, social sciences, the natural sciences, and personal finance. Appropriate choices for modeling come primarily from consideration of rates of growth or decay over discrete increments or from graphical representations of data, possibly data with noise. Students will utilize graphing calculators or spreadsheet programs in simulating and analyzing models. They will translate ordinary language descriptions of a problem into mathematical expression, employ valid, logical approaches to solving the problem, and be able to communicate the results again in ordinary language.

A student in this class is expected to complete the following assignments:

- 1 3 Regular Semesterly Exams
- 2 1 Final Exam
- 3 online quizzes – one or two per chapter
- 4 Homeworks – one on each section of the textbook covered in class
- 5 20+ Poppers – in-class quizzes given daily starting the 3rd week of classes. (Please purchase the correct bubble sheet packet from the bookstore: **MATH1311-04, CRN: 22942**)

Grading Regular Exams: 45% (15% each test)

Final Exam: 15%

Online Quizzes: 15%

Poppers: 15%

Homework: 10%

Total: 100%

Math 1311: Elementary Mathematical Modeling – Outline

Chapter 1: Functions

Functions given by Formulas

Functions given by Tables

Functions given by Graphs

Functions given by Words

Set Theory for Functions

Chapter 2: Graphical and Tabular Analysis

Tables and Trends

Graphs

Solving Linear Equations

Solving Nonlinear Equations

Chapter 3: Straight Lines and Linear Functions

The Geometry of Lines

Linear Functions

Modeling Data with Linear Functions

Linear Regression

Systems of Equations

Chapter 4: Exponential Functions

Exponential Growth and Decay

Modeling Exponential Data

Modeling Nearly Exponential Data

Logarithmic Functions

Connecting Exponential and Linear Data

Chapter 5: A Survey of Other Common Functions

Power Functions

Modeling Data with Power Functions

Combining and Decomposing Functions

Quadratic Functions and Parabolas

Higher-degree Polynomials and Rational Functions

Chapter 6: Rates of Change

Velocity

Rates of Change for Other Functions

Estimated Rates of Change

Equations of Change

Whenever possible, and in accordance with 504/ADA guidelines, the University of Houston will attempt to provide reasonable academic accommodations to students who request and require them. Please call 713-743-5400 for more assistance.