

GEORGIA PERIMETER COLLEGE

MATHEMATICS ACADEMIC GROUP

TEACHING GUIDE - MATH 1101

I. Course Title: Introduction to Mathematical Modeling

II. Prerequisite: Placement into college-level mathematics

III. Text: Elementary Mathematical Modeling by Davis and Edwards, Second Edition, 2007, Prentice Hall

IV. Catalog Description:

This course uses graphical, numerical, symbolic, and verbal techniques to describe and explore real-world data and phenomena. Emphasis is on the use of elementary functions (linear, quadratic, exponential, and logarithmic) to investigate and analyze applied problems and questions, supported by the use of appropriate technology, and on the effective communication of quantitative concepts and results. Functions introduced through applications are the main focus of the course. This course is intended for majors requiring a minimal amount of mathematics (e.g. humanities, social science, nursing, some education majors, etc.)

V. Course Objective:

To provide the non-mathematics, non-science major with an understanding of the role of mathematics in today's society.

VI. General Notes:

A. This course has a primary responsibility for exposing students to group work. You will find several suggestions for group projects listed. Include at least one of these activities or its equivalent in your course. Group projects may be graded or ungraded, worked on in class or out of class, but they must be done by a group of two or more students.

B. The suggested problems include both odd and even numbered exercises. Although answers appear for only the odd numbered problems, the nature of the problems necessitates the inclusion of many even numbered exercises.

C. The T.I.- 84+ graphing calculator is an integral part of this course. Extensive use of the Lists and Stat functions of the graphing calculator is anticipated. The student is expected to be able to find equations that fit the data by hand, **and** know how to use the built-in regression features of the calculator to find the best fit.

VII. Course Outline:

Suggested homework problems for each section are included. This outline does not imply that instructors cover one section per day. Instructors will need to spend more than one class period on some sections. The focus of this course is applications; problems requiring interpretation and explanation are necessarily a major component of each assignment. Each instructor should assign selected problems from this list.

Chapter 1:

- 1.1 1- 14
- 1.2 1- 17
- 1.3 1- 25
- 1.4 1-12 (use built-in regression on calculator; error is optional)

Chapter group activity on page 36 optional

Chapter 2:

- 2.1 1- 32
- 2.2 1- 4, 15-28
- 2.3 3 - 27
- 2.4 5 - 23 (use built-in regression on calculator; error is optional)

Chapter group activity on page 96 optional

Chapter 3:

- 3.1 11- 27
- 3.2 9 - 23
- 3.3 1- 31
- 3.4 1 - 23 (use built-in regression on calculator, error is optional)

Chapter group activity on page 149 optional

Chapter 4:

- 4.1 1 - 12, 16 - 29
- 4.2 19 - 29
- 4.3 1 - 24 (use built-in regression on calculator, error is optional)

Chapter group activity on page 196 optional

Chapter 5:

- 5.1 1- 4, 16 - 30
- 5.2 1-24
- 5.3 7-23 (use built-in regression on calculator, error is optional)

Chapter group activity on page 238 optional

VIII. Evaluation Methods:

The course grade will be determined by the individual instructor using a variety of evaluation methods. A portion of the course grade will be determined through the use of frequent assessment using such means as tests, quizzes, projects, or homework as developed by the instructor. Some of these methods will require the student to demonstrate ability in problem solving and critical thinking as evidenced by explaining and interpreting solutions. A portion of the evaluation process will require the student to demonstrate skill in writing both correct prose and correct mathematics.

A comprehensive final examination is required. The final examination must count at least one-fifth and no more than one-third of the course grade. The final examination should include items which require the student to demonstrate problem solving and critical thinking.

IX. Effective Date: May 2009

Approved Date: January 2009