COURSE OUTLINE
Department/School of [Mathematics/School of Computing and Mathematics]
Georgia Southwestern State University

Subject Code (MATH) Course Number (1101)
Course Title Elementary Mathematical Modeling (Live Lecture)
Credit: Number (3) semester hours

Catalog description:
MATH 1101 Elementary Mathematical Modeling is designed as an entry-level college mathematics course at the same level as MATH 1111, but is intended for students who are not necessarily preparing for subsequent mathematics courses. It is an introduction to mathematical modeling based on the use of elementary functions, to describe and explore real world data and phenomena. Prerequisite: General High School Mathematics. 3 credits. 3-0-3.

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Course Content

1. Functions and Mathematical Modeling
2. Linear Functions and Models
3. Natural Growth Models
4. Continuous and Logarithmic Growth Models
5. Quadratic Functions and Models
6. Polynomial Models and Linear Systems
7. Bounded Growth Models [including logistic and discrete models]
8. Trigonometric Models

Course Learning Outcomes:
1. Students will be able to develop and use simple models based on data sets and elementary functions.
2. Students will become adept at using mathematics in graphical, numerical, symbolic and
verbal form, along with appropriate technology to explore real world data.
3. Students will understand what can and cannot be inferred from mathematical models.
4. Students will develop an appreciation for mathematics and its use in understanding the world.

**REQUIREMENTS:**

Students will be given regular examinations on the main topics of the course, as well as intermediate quizzes to check student progress in learning and applying course materials. All examinations and quizzes will require students to provide answers in both essay and computational form. Students will also keep a portfolio of homework, which will be turned in, and be graded as a part of the entire course grade (10%). Students in the live/lecture class will also be required to participate in class discussions of certain modeling processes.

**INSTRUCTIONAL STRATEGIES:**

Live/Lecture sections of the course will offer the students lectures on course topics, periodic reviews of earlier materials, the opportunity to ask questions about homework, and the opportunity to participate in class discussions. The instructor will also model the use of technology, where appropriate, and help the students understand the model building process from initial assumptions, data selection, solution, and validation, and help them learn to write up the results of a modeling process, and its conclusions in acceptable, technical English. The instructor will also provide students with online resources that will help them understand the modeling process.

**GRADES:**

Grades will be based on at least 4 in-class examinations, a number of intermediate quizzes, an a portfolio of student homework questions, with the distribution set at 90% for examinations and 10% for portfolio.

**Textbooks and Other Required Materials:**


A graphing calculator of the TI-83 series.

**Ancillary Readings for Instructors**

**Notes:**

Given current constraints on faculty time, each section of MATH 1101, will entail a reduction, by one, in the number of sections of MATH 1111 offered in a given term.

Since Nursing and Business students may use this course as an alternative to MATH 1111, some changes will need to be made in the GSW catalogue. For example, Nursing students will be able to use it as a prerequisite for MATH 2204, Elementary Statistics.

The rubric developed for assessing quantitative literacy courses in the core will be applied to MATH 1101 as well.