SU DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE SYLLABUS (Tentative)
MATH 105 Liberal Arts Mathematics:
Math in a Changing World

Objective: Introduce applications of math, especially in biology, money, and ecology, where important things change over time. Students will learn how to formulate, analyze, test, and interpret mathematical models that will solve important, practical problems.

Intended for: Liberal Arts majors requiring a mathematics course to satisfy a Gen-Ed requirement.

Prerequisites: High school mathematics including Algebra II and Geometry.

Text: "Elementary Mathematical Modeling: A Dynamic Approach," James Sandefur, Thomson/Brooks-Cole, 2003. (ISBN-13: 978-0534378035)

Technology: A calculator is required, but students may not use cell phone calculators on exams. Students will also use Microsoft Excel, which is available in campus computer labs.

Topics	**Time**
INTRODUCTION TO MODELING. Dynamical Systems. Examples of Modeling in Biology, Finance, Ecology. Affine Dynamical Systems. Parameters.	**8 hours**
ANALYSIS OF DYNAMICAL SYSTEMS. Biology & Ecology Applications. Equilibrium. Stability. Ratios and Proportional Change. Stable Distributions. Cycles.	**7 hours**
FUNCTION APPROACH. Introduction to Function Approach. Linear Functions. More Biology & Chemistry Applications. Algebraic Analysis.	**8 hours**
HIGHER ORDER DYNAMICAL SYSTEMS. Introduction. Counting Sets. Analyzing Higher Order Dynamical Systems. An Economic Model. Controlling an Economy. Algebraic Analysis of Higher Order Systems.	**8 hours**
NONLINEAR DYNAMICAL SYSTEMS. Introduction. The Dynamics of Alcohol Metabolism. Stability. Web Analysis.	**6 hours**
POPULATION DYNAMICS. Introduction to Population Growth. The Logistic Model for Population Growth. Nonlinear Growth Rates. Graphical Approach to Harvesting. Economics of Harvesting.	**8 hours**
GENETICS. Introduction to Population Genetics. Basics of Genetics. Mutation. Selection.	**8 hours**
TESTING	**3 hours**

Evaluation:

Problem Sets:	15%
Quizzes:	25%
Exams:	40%
Final Exam:	20%

This course complies with the University Policy on Writing Across the Curriculum. The ability to communicate mathematics effectively both orally and in writing is very important. The assignments in this course are designed to help students develop and enhance that ability.

NOTE: ONCE A STUDENT HAS RECEIVED CREDIT, INCLUDING TRANSFER CREDIT, FOR A COURSE, CREDIT MAY NOT BE RECEIVED FOR ANY COURSE WITH MATERIAL THAT IS EQUIVALENT TO IT OR IS A PREREQUISITE FOR IT.
SMH/JLH 9/2017