

# MA 354 Computer Assisted Mathematical Modeling

Syllabus\*

**Course Description** This course is intended to provide the basic ideas regarding formulation, development, testing and reporting of mathematical models of various real world problems. Deterministic and stochastic models, optimization and simulations will be covered. Emphasis will be on careful mathematical formulations and the use of computer software, such as Microsoft Excel, Mathematica and Matlab. A term project will be an important component of this course. The course is taught in a laboratory setting with computers as lab equipment. This is a designated writing (W) course.

**Prerequisites** C or better in EH 102, MA 227 and MA 238

**Textbook** *A first course in mathematical modeling*, 4th edition by F.R. Giordano, W.P. Fox, S.B. Horton and M.D. Weir. Published by Brooks/Cole. ISBN #9780495011590.

## Topics & Time Distribution

Coverage: Chapter 1	all sections	5 weeks
Chapter 11	(omit 11.6 and 11.7)	3 weeks
Chapter 12	(omit 12.5)	2 weeks

Note - time allotments are approximate and do not include exams.

## MA 354 Computer Assisted Mathematical Modeling Learning Objectives

- To study the behavior of mathematical models of real-world problems analytically and numerically. The mathematical conclusions thus drawn are interpreted in terms of the real-world problem that was modeled, thereby ascertaining the validity of the model.
- To model real-world observations by making appropriate simplifying assumptions and identifying key factors.

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\*Last updated July 27, 2011