MATH 350 Mathematical Software

1. Catalog Description

MATH 350 Mathematical Software **4 units**

Prerequisite: MATH 206 or MATH 244, and MATH 241, and an introductory college-level programming course, or consent of instructor.

Problem-solving using mathematical software. 4 lectures.

2. Required Background or Experience

Math 206 or Math 244, and Math 241, plus an introductory college-level programming course.

3. Learning Objectives

Upon successful completion of this course, students should:

a. Understand how to use mathematical software to perform calculations pertaining to calculus, linear algebra and numerical analysis.
b. Be able to write and debug programs using the programming language which is part of the mathematical software.
c. Understand how to construct graphical output from the mathematical software.

4. Text and References

To be chosen by instructor.

5. Minimum Student Materials

Paper, pencils, and notebook.

6. Minimum University Facilities

Advanced workstations with mathematical software installed. Classroom with ample chalkboard space.

7. Content and Method

a. Introduction to the software and the support systems

b. Basic scientific computations

c. Description of internal representation of data and programming

d. Working with equations and performing calculations using calculus, linear algebra, and numerical analysis

e. Graphics, graphs of functions of one or two variables, parametric curves, parametric surfaces and curves described implicitly

f. Performing empirical mathematical exploration using mathematical software

8. Methods of Assessment

The methods of assessment include midterm(s), a final, regular programming assignments and a larger programming project. The larger programming assignment will explore a topic in mathematics or the relationship of that mathematics to the mathematical software system. This topic will be chosen by the student with instructor approval.