MATH 502  Numerical Methods in Applied Mathematics

1. Catalog Description

   MATH 502  Numerical Methods in Applied Mathematics  (4)

   Introduction to advanced numerical analysis. Numerical techniques for solving ordinary and
   partial differential equations, error analysis, stability, methods for linear systems. Not open
   to students in math major or master’s degree program in mathematics. 4 lectures.
   Prerequisite: MATH 344 or AERO 300, an introductory college-level programming course
   and graduate standing.

2. Required Background or Experience

   MATH 344 or AERO 300, an introductory college-level programming course, and graduate standing.

3. Learning Objectives

   The student should
   a. Assess the appropriateness of a given numerical scheme for the solution of an ordinary or partial
      differential equation by calculating the accuracy and determining the stability of the scheme.
   b. Apply standard numerical techniques to solve ordinary and partial differential equations.

4. Text and References

   The text is to be chosen by the instructor. Possible texts include:
   a. Randall LeVeque, Finite Difference Methods for Ordinary and Partial Differential Equations: Steady-

5. Minimum Student Materials

   Paper, pencils, notebook, and access to computer.

6. Minimum University Facilities

   Classroom with ample chalkboard space and computer lab.
7. **Expanded Course Content**

Below is one possible week-by-week outline:

**Week 1**

**Week 2**

**Week 3**

**Week 4**

**Week 5**

**Week 6**

**Week 7**

**Week 8**

**Week 9**

**Week 10**

8. **Methods of Assessment**

Homework, tests and class participation.