MATH 720 | University of South Carolina
D. Meade | Fall 1998

MATH 720 – Applied Mathematics I

Instructor Professor Doug Meade

Office LeConte College 300E

Phone 777-6183

E-mail `meade@math.sc.edu`

WWW URL `http://www.math.sc.edu/~meade/math720/`

Meeting Times MWF 10:10AM–11:00AM, LeConte College 316

Office Hours MW 11:00–12:00, 4:00–5:00 and by *prior* appointment

Text J. David Logan, *Applied Mathematics*, second edition, John Wiley & Sons, 1997.

Prerequisite Completion of Math 555 (Analysis II) or equivalent.

Course Content The majority of the semester will be spent understanding the first four chapters of the text. Additional material will be included as time permits.

Overview The purpose of this class is to provide an survey of topics topics within the broad field known as Applied Mathematics. These include

- mathematical modeling
- dimensional analysis
- analytical solution techniques
- approximations and numerical methods
- perturbation techniques
- asymptotic analysis
- variational methods
- solution of linear and nonlinear systems of equations
- ordinary and partial differential equations
- integral equations

It is not possible to discuss each of these items in detail. In general, our goal is to thoroughly understand the material in the first three chapters of the text. If there is additional time at the end of the semester, additional topics will be selected. I welcome suggestions for topics that are of interest to you.

Most results will not be proven in great detail. Instead, we will be more interested in understanding when a technique is applicable, what types of difficulties can occur, and how the results can be applied. Examples will be used to motivate new ideas when this is possible. A solid background in linear algebra and ordinary differential equations will be beneficial.

Computer Usage The text refers to Maple in several places. I expect to prepare additional materials in Maple. These will be available from the course homepage as they are finished.

Grading Your grade in this course will be based on your performance on homework assignments and a final exam. The weights assigned to each of these components will be:

Homework	50%
Final exam	50%

Note that the deadline to drop this course with a grade of W is Thursday, October 1, 1998.

Exam A comprehensive take-home final exam will be given at the end of the semester. Specific details will be provided at the appropriate time.

Homework Problems will be assigned throughout the semester. In general, your solutions will be due one week after the problems are assigned. Homework will be graded and returned as quickly as possible.

Some of the problems will may be time consuming to solve by hand. You should consider using the computer (*e.g.*, Maple) to help visualize the problem and to perform numerical and detailed symbolic manipulations. Do not hesitate to ask for assistance.

Your solutions must be well organized and neat. Explanations should be given in full English sentences. You don't have to show all of the details of your work, but your solution should clearly indicate all steps in the solution.

Study Hints Before each class, you should both review the material from recent sections and read the section to be discussed that day. This will allow you to both understand and participate in the presentation of new material and identify questions that you need to resolve before completing the homework.

Some of the class time will be available for questions. However, you should not always wait for class to ask your questions. I welcome questions during office hours and via e-mail. Please make optimal use of these opportunities.

Attendance Regular class attendance is important. Consistent with the USC Undergraduate Bulletin, a grade penalty may be applied to any student missing more than five classes (10%) during the semester.

Academic Honesty Cheating and plagiarism will not be tolerated in this course. You may discuss homework problems with others, but do not copy solutions from another student or from a book. Violations of this policy will be dealt with in a matter consistent with University guidelines.