MA 341 - Applied Differential Equations I
Fall 2005

1 Instructor:

Dr. Kartik Sivaramakrishnan
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2 Teaching Assistants:

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3 When and Where:

Tuesdays and Thursdays between 1.30-2.45 pm in HA 201.

4 Instructors office hours:

Kartik’s office hours are Mondays, Wednesdays, and Fridays between 11-12 pm, or by appointment. To set up an appointment, please send me an email in advance.

5 Course webpage:

The official webpage for this course is located at http://courses.ncsu.edu/ma341/lec/004/. This webpage is also mirrored at http://www4.ncsu.edu/~kksivara/ma341/. It is your duty to check the webpage regularly for course announcements. I will also post course material, including handouts, homeworks, and exams here. The webpage should be up to date. However, please inform me about missing links, and necessary updates by sending me email.

6 Course prerequisites:

MA 242 or (MA 132 and MA 231) are the prerequisites for the course.
7 Course objectives:

This course is a unique blend of the theory of differential equations, analytical and simple numerical techniques for their solution, and finally their exciting application to real world problems. First and foremost, the course is a rigorous study of ordinary differential equations and can be fully understood by anyone who has the necessary prequisites. We will also consider a number of exciting applications from science and engineering. These applications are entirely self contained. First, the problem to be solved is outlined clearly, and one or more differential equations are derived as a model for the problem. These equations are then solved, and the results are compared with real world data.

8 Course topics:

The following topics will be covered in the course:

1. Introduction
2. First-Order Differential Equations
4. Linear Second-Order Equations
5. Laplace Transforms
6. Matrix Methods for Linear Systems
7. Introduction to Systems and Phase Plane Analysis
8. Stability of Autonomous Systems

A detailed listing of course topics can be found in the class schedule on the course webpage.

9 Compuational resources:

We will use both MAPLE and MATLAB in course homeworks. MAPLE will be our primary resource, although, you will need to write small MATLAB programs towards the end of the course. Information on both MAPLE and MATLAB is available on the course webpage and I will review some of the important commands in class.
10 Homeworks:

Homeworks are assigned roughly every two weeks and posted on the course webpage. Some of the homework assignments will involve MAPLE and MATLAB. Early in the semester, I will designate teams of 3 individuals. All assignments should be submitted as a group unless otherwise specified. You may discuss your homeworks with other groups, but each group must work through, write up, and turn in the assignments on your own. Groups will periodically be asked to submit individual effort assessments with completed assignments. These assessments will be incorporated into the assignment of homework grades. You must turn a hard copy of your homework in the beginning of class on the due date. Late homeworks will not be accepted without a prior instructor approval. I will hand out the homework solutions in class. They will not be posted on the course webpage.

11 Exams:

There will be three one hour tests during the semester, and a comprehensive final exam. See the course schedule on the class webpage for more information on the tests. All tests are open book and class notes. The final exam will be held in class on Thursday, December 8th between 1-4 pm. As you expect, each exam has to be your own work. You will not miss an exam without a certified medical excuse or prior instructor approval. If you cannot make it to an exam, please let me know well in advance!

12 Grading:

Please make it a point to pick up your corrected homework assignments. I will notify you by email once I am done with the grading, and it is then your responsibility to pick up your group’s assignment. If you detect mistakes in the grading, notify me immediately. Homework scores will not be changed one week after they have been returned!. The responsibilities for grading the exams resides with the TA. If you believe an error has been made in grading an exam, bring it to the attention of the TA during his/her office hours. Only if you are not satisfied with the TA’s decision, do you come and see me.

13 Calculation of course grade:

A weighted average will be calculated as follows:

1. Homeworks: 25 %,

2. Tests (3): 40 %
3. Final exam: 35 %.

Homeworks are given the same weight and one homework will be dropped at the end of the semester. The grade scale is the following: 90-100 A-,A,A+; 80-89 B-,B,B+; 70-79 C-,C,C+; 60-69 D-,D,D+; below 60 F.

14 Textbooks:


The textbook can be purchased from the campus bookstore and is available on reserve in the D.H. Hill library.

15 Academic Integrity:

Please review the guidelines posted at http://www.ncsu.edu/provost/academic-regulations/integrity/reg.htm.

16 Disability services for students:

Please check http://www.ncsu.edu/provost/offices/affirm-action/dss/ for more information.