

# PARTIAL DIFFERENTIAL EQUATIONS, SPRING 2008 SYLLABUS

## 1 Prerequisites:

Multivariable Calculus and Ordinary Differential Equations

Multivariable Calculus is the most important prerequisite. It is often the case that students tell me that their knowledge of Multivariable Calculus is rusty, and then go on to be successful in PDE. However, these people should be prepared to review and relearn important background material. In fact, a deeper understanding of this background material is one of the major side benefits of studying PDEs.

The necessary background from Ordinary Differential Equations is quite limited. On the first day of class I will provide a handout that describes the few topics from ODEs that will be helpful in our courses. It is clearly possible to learn the material on this handout in just a few days, and to then be successful in PDEs.

## 2 Text:

Partial Differential Equations, An Introduction, by Walter A. Strauss, second edition

## 3 Course Content:

We will study the starred sections in chapters 1-6. If time allows, I will also introduce several topics that are not covered in the text.

## 4 Homework:

During most class meetings I will suggest homework problems. I expect you to do all of the problems in a timely manner, and I expect you to ask questions promptly when you are having trouble. In fact, I strongly suggest that you read a section and attempt some of its problems before that section is discussed in class. If you do this then you will find that class time is more

meaningful and that your chances of subsequently solving the homework problems is higher. I will not collect and grade homework.

## **5 Problem/Study Sessions: (Optional)**

I will set up several study sessions each week where students can come to take a practice quiz and to get help solving homework problems. Students who take the practice quizzes can earn extra credit points that apply to the chapter tests.

## **6 Chapter Tests:**

At the end of each chapter there will be a take-home test. Roughly 75% of the problems on each test will be homework problems that I suggested to you as we studied the chapter. The other 25% will be interesting questions that I am just dying to ask.

Your total score on the chapter tests will be worth 1/3 of your grade.

## **7 Report:**

Every student is expected to write a short report on a topic not covered in class. I will provide a list of suggested topics, most of which are discussed in some part of the text. (See handout.) The report should be about 10 written pages, not including diagrams. There is no limit to the number of diagrams that you can include. Towards the end of the semester you will be asked to make a 20 minute presentation of your report.

The report will be worth 1/3 of your grade.

## **8 Final Exam:**

The final exam is scheduled for Monday, May 5, 9:00-12:00. (See handout for a description of the exam.)

The final exam will be worth 1/3 of your grade.

## 9 Evaluation:

If you consistently demonstrate an ability to perform standard computations and solve standard problems, then you have a good chance of earning a C or better. If you can also solve some more difficult problems, and provide some insight as to why the methods work, then you have a good chance of earning a B or better. If you become adept at solving standard and nonstandard problems, and if you can clearly justify all of the methods that you use, then you have a good chance of earning an A. Hard work is a prerequisite for earning a good grade (A, B, or C), but no amount of work will guarantee you a particular grade. Just do the best that you can, and then be proud of the grade that you have earned. If you are ever unsure about a grading policy, or if you are not sure where you stand, then you are welcome to ask.

Important Remark For Graduate Students: Graduate students are expected to live up to a higher standard than undergraduates. This expectation will be reflected in the grading policy.