

Math 427K: Advanced Calculus for Applications I

Unique Number 58870

Fall Semester 2008

Where am I?

You are in Associate Professor Dan Knopf's Math 427K class. Your TA is Mark Norfleet.

Lectures meet 12:00–12:50 Mondays, Wednesdays, and Fridays in PHR 2.110.

Problem sessions meet 2:00–2:50 Tuesdays and Thursdays in PHR 2.108.

Why am I here?

Ordinary and partial differential equations are the fundamental tools that modern science and engineering use to model physical reality. In these disciplines, the main applications of differential equations are to model complex physical phenomena. Consequently, it is seldom enough merely to know that a differential equation has solutions. It is more important to know when these solutions are unique and how to understand their behaviors, so that one can gain insight into the physical processes the differential equation is supposed to model. This course will introduce you to a variety of important techniques used to find and qualitatively analyze solutions of differential equations, with emphasis on those that arise in applications.

What are the prerequisites for this course?

The prerequisite is Math 408D or 408L (or equivalent) with a grade of at least C.

What materials should I have?

You need the following textbook: *Elementary Differential Equations and Boundary Value Problems*, Eighth Edition, by William E. Boyce and Richard C. DiPrima. John Wiley & Sons, Inc. ISBN 0-471-43338-1.

How can I get extra help?

- Assignments and announcements will be posted on BLACKBOARD. A discussion board will be provided there for you to post questions. Your TA and I will check this frequently and answer your questions as promptly as possible.
- You are also encouraged to ask for individualized help at any time. You may contact us as follows:

Name	E-mail	Office	Phone	Office hours
Dan Knopf	danknopf@math.utexas.edu	RLM 9.152	471.8131	M 10:00–11:00, F 1:00–3:00
Mark Norfleet	mnorfleet@math.utexas.edu	RLM 9.124	475.9134	Tu & Th 12:30–2:00

- Contact information for the Mathematics Advising Center may be found at

<http://www.ma.utexas.edu/dev/math/Undergrad/Advising.html>

- The University of Texas at Austin provides, upon request, appropriate academic accommodations for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471.6259 or 471.6441 (TTY).

If you fall under the University's Learning Disability Policy, you must present the Dean of Student's certification of that fact to me prior to the first exam.

How will the course be graded?

There will be homework, two midterm exams, and a cumulative final.

- **Homework:** There will be eleven homework assignments. (See schedule below.) Each homework will be posted on BLACKBOARD approximately one week before it is due.
 - **The lowest two homework scores will be dropped**, to allow for illness, emergencies, and other valid nonacademic excuses.
 - **The remaining nine scores will be averaged to determine 15% of your overall grade.**
 - **A late assignment counts as a missed assignment.** Late homework will not be accepted under any circumstances. (The sole exception is a conflict with a religious holy day, in which case you must contact me in advance.)
 - **Your assignments must be legible, neat, and stapled.**
- **In-class exams:** There will be two in-class exams. (See schedule below.) Each will count for **25%** of your overall grade.
 - **No exam scores will be dropped.**
 - **If you miss an exam, you need a written excuse to be allowed to take a make-up.**
- **Final exam:** The final exam time is set by the Registrar. (See schedule below.) The final will determine **35%** of your overall grade.
 - If you have a schedule conflict with the final, contact me at least two weeks in advance.

Your overall grade will be computed according to the following scale:

A	90–100
B	80–89
C	70–79
D	60–69
F	0–59

Can you give me some tips for the course?

- **Do the homework.** No student, no matter how talented, can learn mathematics without working examples themselves. The most important component of success in almost any math course is diligence in doing practice exercises.
- **Read the text.** To get the most benefit from the lectures and problem sessions, you should read relevant sections of the text as they are covered in class.
- **Study together.** You are encouraged to study together with your peers enrolled in the class. In particular, you should make arrangements to share notes in case you miss class due to illness. However, the work on your written homework must always be your own.
- **Be proactive.** Take advantage of office hours and problem sessions. You must inform me in advance if you will miss a homework or exam deadline due to observance of a religious holy day.
- **Be honest.** Any academic dishonesty will be severely penalized. In this regard, please note:

No books, notes, calculators, or cell phones are allowed during exams.

What is the lecture schedule?

The following lecture schedule may be altered for pedagogical reasons. **It is your responsibility to be aware of any changes announced in class.**

Wednesday, August 27 Introduction

Friday, August 29 Sections 1.1, 1.2

Monday, September 1 *Labor Day: no class*

Wednesday, September 3 Sections 1.3, 2.1

Friday, September 5 Section 2.2

Monday, September 8 Section 2.3 **(Homework 1 due)**

Wednesday, September 10 Section 2.5

Friday, September 12 Section 2.6 *(Last day to drop with a possible refund)*

Monday, September 15 Section 3.1 **(Homework 2 due)**

Wednesday, September 17 Section 3.2

Friday, September 19 Section 3.3

Monday, September 22 Section 3.4 **(Homework 3 due)**

Wednesday, September 24 Section 3.5 *(Last day to drop without possible academic penalty)*

Friday, September 26 Section 3.8

Monday, September 29 Section 3.7 **(Homework 4 due)**

Wednesday, October 1 Section 3.9

Friday, October 3 Review

Monday, October 6 — Exam I (at regular class time, UTC 4.110,-112,-134)

Wednesday, October 8 Sections 4.1, 4.2

Friday, October 10 Sections 7.1, 7.2

Monday, October 13 Section 7.3 **(Homework 5 due)**

Wednesday, October 15 Section 7.5

Friday, October 17 Section 7.6

Monday, October 20 Section 9.1 **(Homework 6 due)**

Wednesday, October 22 Section 9.2 *(Last day to drop for academic reasons)*

Friday, October 24 Section 9.3

Monday, October 27 Section 9.4 (**Homework 7 due**)

Wednesday, October 29 Section 6.1

Friday, October 31 Section 6.2

Monday, November 3 Section 6.3 (**Homework 8 due**)

Wednesday, November 5 Sections 6.4, 6.5

Friday, November 7 Review

Monday, November 10 — Exam II (at regular class time, UTC 4.110,-112,-134)

Wednesday, November 12 Section 5.1

Friday, November 14 Section 5.2

Monday, November 17 Section 5.3 (**Homework 9 due**)

Wednesday, November 19 Section 10.1

Friday, November 21 Section 10.2

Monday, November 24 Section 10.3 (**Homework 10 due**)

Wednesday, November 26 Section 10.4

Friday, December 28 *Thanksgiving holiday: no class*

Monday, December 1 Section 10.5

Wednesday, December 3 Section 10.7 (**Homework 11 due**)

Friday, December 5 Review

Thursday, December 11 — Final Exam (2:00–5:00 PM, JGB 2.324)