

Differential Equations with Applications
MATH 4512

Instructor: Bernardo Cockburn. Office: Vincent Hall 327

Fall 2015 schedule: MWF 10:10-11:00, Vincent Hall 20

- **Objective:** In this course, we study several basic aspects of differential equations modeling phenomena of interest in physics and engineering.

- **Textbook:** *Differential Equations and their Applications*, by Martin Braun, Springer, 1993 (4th. edition). We will cover the first four chapters.

- **Grade:** 40% homeworks (seven homeworks, the best four scores are kept), 30% midterms (four midterms, the best three scores are kept) and 30% final (on December 23, 1:30-3:30pm).

- **Office hours:** By appointment **only**. To get one, just send me an e-mail to cockburn@math.umn.edu.

Tentative schedule.

- (1) Sept. 9: §1.2, §1.3; Sept. 11: §1.4
- (2) Sept. 14: §1.5; Sept. 16: §1.10; Sept. 18: §2.1 (Homework 1 due)
- (3) Sept. 21: §2.2; Sept. 23: §2.3, 2.4; Sept. 25: Review
- (4) Sept. 28: **Midterm**; Sept. 30: §2.5; Oct. 2: §2.6;
- (5) Oct. 5: §2.6; Oct. 7: §2.6; Oct. 9: §2.9;
- (6) Oct. 12: §2.10 (Homework 2 due) Oct. 14: §2.11; Oct. 16: §2.12;
- (7) Oct. 19: §2.13 (Homework 3 due); Oct. 21: Review; Oct. 23: **Midterm**
- (8) Oct. 28: §3.1, 3.2, 3.3; Oct. 30: §3.4, 3.5, 3.6; Nov 2: §3.7, 3.8, 3.9;
- (9) Nov. 2: §3.10 (Homework 4 due); Nov. 4: §3.11; Nov. 6: §3.12;
- (10) Nov. 9: §3.13 (Homework 5 due); Nov. 11: §4.1; Nov. 13: §4.2
- (11) Nov. 16: §4.3; Nov. 18: §4.4 (Homework 6 due); Nov. 20: §4.5
- (12) Nov. 23: **Midterm**; Nov. 25: §4.6
- (13) Nov. 30: §4.7; Dec. 2: §4.8; Dec. 4: §4.9
- (14) Dec. 7: §4.10 (Homework 7 due); Dec. 9: §4.11; Dec. 11: §4.12
- (15) Dec. 14: §1.13; Dec. 16: **Midterm**

Homeworks.

- (1) #1: Problems 8, 12 from §1.2; 7, 11, 15 from §1.4.
- (2) #2: Problems 11 from §1.7; 19 from §2.2.1; 11 from 2.2.2; 7, 15 from §2.5.
- (3) #3: Problems 1, 9, 11 from §2.6.
- (4) #4: Problems 5 from §2.11, 7 from §2.12, 11 from §2.13.
- (5) #5: Problems 3 from §3.8, 5 from §3.9, 7 from §3.10.
- (6) #6: Problems 1, 5, 9 from §4.7.
- (7) #7: Problems 3 from §4.3, 7 from §4.4, 11 from §4.6.