

Text: *Differential Equations and Linear Algebra*, C. Henry Edwards and David E. Penny, Prentice Hall, 2001.

Prerequisites: You should already have taken Math 12 and 13. If you want to take Math 38 concurrently with Math 13, you should get permission from your Math 38 instructor. Note that Math 13 and 38 have tests at the same times.

Exams: There will be three exams given during the open periods on Thursday, February 24, Monday, March 14 and Monday, April 11. **IN ADDITION, there will be a Quiz scheduled during class time and that you MUST take.** The final exam is on Friday, May 6 from 8:30 to 10:30am. Test rooms will be announced in class.

There will be no make-ups for the three midterm exams. As for the Quiz, only a valid medical excuse will exempt you from it and there will be a make-up on Wednesday, April 27 from 4:00 to 4:50 pm. No other make-ups will be given. Students who register for Math 13 will have exams at the same time and will have to take them back-to-back. Students should notify both instructors.

Final: *The final is cumulative.* Notify your instructor well in advance of any time conflicts with other exams.

Cheating: Mathematics Department policy requires you to sign your exam book before handing it in. *With your signature you are pledging that you have neither given nor received assistance on the exam. Students found violating this pledge will receive an F in the course.* We routinely copy some of the pages from the exam books we grade to discourage “improvements.” If you question the grading on a particular problem, write your instructor a note explaining your point and resubmit the book and note at the end of the class when the graded books were returned.

Homework: Homework assignments are due the class period after they are assigned. Graders will begin collecting homework on **January 24** – you should be handing in only the assignment from Lecture 3 on that day. Homework from lectures 1 and 2 will not be graded, but will be gone over in class. To receive credit for a given assignment, you must a) at least attempt each problem and b) get 60 percent of the answers correct. You may work with classmates, but your homework answers should be written in your own words.

Grades: The midterm exams and the final will be graded over 90 points, not 100. To obtain your final grade we list your three exam scores and your final score twice, drop the lowest of these numbers (once) and then, if you have satisfactorily completed $n \geq 25$ homework assignments, add $n/5$ bonus points. We then add your Quiz score (which is a number ≤ 40), divide by 4, round and convert to letter grades according to the usual Math Department scheme.

Dropping, adding, and withdrawing: Thursday, February 3rd is the last day to add courses. Thursday, February 17 is the pass/fail deadline for upperclassmen (and ladies) to drop without a **W**. Thursday, April 7 is the last day for freshmen to drop without a **W**. May 2nd is the last day to drop with a **W**.

The Course: Math 38 is a fun course in which you learn how to solve many ordinary differential equations (ODEs). These equations are fundamental to physics and the sciences, and their solutions give important physical information about the systems they model. Most of the course is devoted to the mathematics of linear ODEs, but you will learn about springs and other systems. We will start with first order equations, including separable and linear equations and phase portraits for autonomous equations. Then, we study higher order linear ODEs and systems of ODEs. These equations are so complicated; we will need to learn some linear algebra, which is important in its own right. We will use linear algebra to solve systems of ODE simply and elegantly. Finally, we will study Laplace Transforms, a powerful method to solve linear constant coefficient ODE. This method is important in engineering and it allows you to solve equations with forces that change discontinuously (say, as electricity is turned on in a circuit).

Lecture No.	Sections	Homework (due the next class)
1	1.1-1.2	p.9/ 2,6,13,15; p.17/ 2,6,15,19,21
2	1.4	p.40/ 2,5,17,20,25,29,32,42,46
3	1.5	p.52/ 3,4,5,12,17,18
4	Handout 1	Handout problems
5	3.1-3.2	p.149/ 1,2,3,5,8,9
6	3.3	p.169/ 21-30
7	3.4	p.181/ 1,3,5,8,9,17,19,23
8	3.5	p.195/ 2,4,5,7,9,11,12,13,21
9	3.6	p.213/ 1,2,3,6,21,27
10	5.1 & Handout 2	p.284/ 1,3,8,17,21 & Handout problems
11	5.2	p.297/ 1,3,6,7,9,10,13,15,21,23,27
12	5.3 (pp.300-304)	p.310/ 1,5,10,11,15,21,25,27
13	5.3 (pp.304-309)	p.310/ 8,9,14,16,35,39
14	Handout 3	Handout problems
15	5.5 (pp.324-332)	p.336/ 1,2,5,8,11,12
16	5.5 (pp.333-336)	p.336/ 21,22,33,39,47,53
17	Handout 4	p.336/ 54, 56, 58 & Handout problems
18	4.2	p.245/ 1,3,4,7,15,16,17,20,23
19	4.3	p.253/ 1,4,5,7,9,12,13,14
20	6.1	p.362/ 1,4,10,13,16,19,20
21	7.1 & Handout 5	p.393/ 1,3, & Handout problems
22	7.2	p.408/ 4,5,13,16,23,25
23	7.3 (409-416)	p.421/ 1,2,3,6,17,19,21
24	7.3 (416-421)	p.421/ 8,11,13,15,24,25
25	Handout 6	Handout problems
26	9.1 & Handout 7	p.523/ 1,26 & Handout problems
27	9.2	p.537/ 1,3,11,21,29
28	Handout 8	Handout problems (1)
29	Handout 8	Handout problems (2)
30	10.1	p.581/ 1,3,4,5,8,9,11,15,16,19
31	10.1	p.581/ 23,24,26,28,30,34
32	10.2	p.593/ 1,3,5,6,7,8,10,17,19,21
33	10.3	p.603/ 1,5,6,8,12,14,17
34	10.4	p.614/ 2,5,8,10,15,16,17
35	10.5 (pp.615-618)	p.624/ 2,5,9,12,17
36	Additional problems on Heaviside functions and systems	

Spring 2005

Math 38 Calendar, Spring 2005

Class No.	Section F	Sections C, I	Section D	Section E
1	1/20	1/21	1/20	1/21
2	1/21	1/25	1/24	1/24
3	1/25	1/26	1/25	1/26
4	1/27	1/28	1/27	1/28
5	1/28	2/1	1/31	1/31
6	2/1	2/2	2/1	2/2
7	2/3	2/4	2/3	2/4
8	2/4	2/8	2/7	2/7
9	2/8	2/9	2/8	2/9
10	2/10	2/11	2/10	2/11
11	2/11	2/15	2/14	2/14
12	2/15	2/16	2/15	2/16
13	2/17	2/18	2/17	2/18
14	2/18	2/22	2/22	2/23
15	2/22	2/23	2/24	2/24
Test 1	Thursday, February 24			
16	2/25	2/25	2/28	2/25
17	3/1	3/1	3/1	2/28
18	3/3	3/2	3/3	3/2
19	3/4	3/4	3/7	3/4
20	3/8	3/8	3/8	3/7
21	3/10	3/9	3/10	3/9

22	3/11	3/11	3/14	3/11
Test 2	Monday, March 14			
23	3/15	3/15	3/15	3/14

Math 38 Calendar, Spring 2005

Class No.	Section F	Sections C, I	Section D	Section E
24	3/17	3/16	3/17	3/16
25	3/18	3/18	3/28	3/18
March 19-27: SPRING BREAK				
26	3/29	3/29	3/29	3/28
27	3/31	3/30	3/31	3/30
28	4/1	4/1	4/4	4/1
29	4/5	4/5	4/5	4/4
30	4/7	4/6	4/7	4/6
31	4/8	4/8	4/11	4/8
Test 3	Monday, April 11			
32	4/12	4/12	4/12	4/11
33	4/14	4/13	4/14	4/13
34	4/15	4/15	4/19	4/15
35	4/19	4/19	4/21	4/20
36	4/21	4/20	4/25	4/22
37	4/22	4/22	4/26	4/25
38	4/26	4/26	4/28	4/27
39	4/28	4/27	5/2	4/29
40	4/29	4/29		4/29
FINAL EXAM - FRIDAY, MARCH 6 - 8:30-10:30 AM				

Lecture No.
1
2
3
4
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7
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13
14
Review
1 to 13
15
16
17
18
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21
14-20
22

Lecture No.
23
24
25
26
27
28
29
30
21 to 29
31
32
33
Review of Laplace Transforms
Laplace Quiz
34
35
Review & additional problems on heaviside fns
Review