

# MAP 2302 Elementary Differential Equations

## INSTRUCTOR

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## CLASS TIME AND LOCATION

MWF 4:05 - 4:55 (9<sup>th</sup> Period), Little 113

## OFFICE HOURS

MWF 3:00-3:50: (8<sup>th</sup> Period), Little 483 or by an appointment.

## DESCRIPTION AND GOALS

Differential equation arises in many physical phenomena of science and engineering. Students will learn how differential equations can be modeled from reality under certain assumptions. They will also study the techniques for solving ordinary differential equations.

## TEXTBOOK

R. K. Nagle, E. B. Saff and A. D. Snider, Fundamentals of Differential Equations , 8<sup>th</sup> Edition., Pearson Education, ISBN-10: 0-321-74773-9

## TOPICS

The following chapters are going to be covered from the mentioned textbook

Chapter 1 Introduction

Section: 1.1, 1.2, 1.3.

Chapter 2 First-Order Differential Equations

Section: 2.1, 2.2, 2.3, 2.4, 2.6

Chapter 3 Mathematical Models and Numerical Methods Involving First-Order Equations

Section: 3.1, 3.2, 3.4, 3.5

Chapter 4 Linear Second-Order Equations

Section: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.9, 4.10

Chapter 5 Introduction to the Systems and Phase Plane Analysis (If time permits)

Section: 5.1, 5.2, 5.7

Chapter 7 Laplace Transforms

Section: 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8

Chapter 8 Series solutions of Differential equations (If time permits)

Section: 8.1, 8.2, 8.3, 8.4

## COURSE CALENDAR (Tentative)

02JAN		03 JAN	04JAN SECTION 1.1 LECT.1	05 JAN	06JAN SECTION 1.2 LECT.2
09JAN SECTION 1.3 LECT.3		10 JAN	11JAN SECTION 2.1 SECTION 2.2 LECT.4	12 JAN	13JAN SECTION 2.3 LECT.5
<b>16 JAN HOLIDAY</b>		017JAN	18JAN SECTION 2.4 LECT.6	19 JAN	20JAN SECTION 2.6 LECT.7
23 JAN SECTION 3.1 LECT.08 SECTION 3.2		24 JAN	25JAN SECTION 3.2 LECT.09	26 JAN	<b>27JAN REVIEW I LECT. 10</b>
<b>30 JAN TEST 1</b>		31 JAN	01 FEB SECTION 3.4 LECT.11	02 FEB	03 FEB SECTION 4.1 SECTION 4.2 LECT.12
06 FEB SECTION 4.2 LECT.13 SECTION 4.3		07 FEB	08 FEB SECTION 4.4 LECT.14	09 FEB	10 FEB SECTION 4.5 LECT.15
13 FEB SECTION 4.6 LECT.16		14 FEB	15 FEB SECTION 4.7 LECT.17	16 FEB	17 FEB SECTION 4.9 SECTION 4.10 LECT.18
20 FEB SECTION 5.1 LECT. 19 SECTION 5.2		21 OCT	22 FEB SECTION 3.5 SECTION 5.7 LECT.20	23 FEB	<b>24 FEB REVIEW II LECT. 21</b>
<b>27 FEB TEST 2</b>		28 FEB	01 MAR SECTION 7.1 SECTION 7.2 LECT.22	02 MAR	03 MAR SECTION 7.2 LECT.23
<b>06 MAR HOLIDAY</b>		07 MAR	<b>08 MAR HOLIDAY</b>	09 MAR	<b>10 MAR HOLIDAY</b>
13 MAR SECTION 7.3 LECT.24		14 MAR	15MAR SECTION 7.4 LECT.25	16 MAR	17 MAR SECTION 7.5 LECT 26
20 MAR SECTION 7.6 LECT.27		21 MAR	<b>22 MAR REVIEW III LECT.28</b>	23 MAR	24 MAR SECTION 7.7 LECT.29
<b>27 MAR TEST 3</b>		28 MAR	29 MAR SECTION 7.8 LECT.30	30 MAR	31 MAR SECTION 7.8 LECT.31
03 APR SECTION 8.1 LECT.32		04 APR	05 APR SECTION 8.2 Lect.33	06 APR	07 APR SECTION 8.2 Lect.34
10 APR SECTION 8.3 LECT.35		11 APR	12 APR SECTION 8.4 LECT. 36	13 APR	<b>14 APR REVIEW IV LECT. 37</b>
<b>17APR TEST 4</b>		18 APR	<b>19 APR FINAL REVIEW LECT. 38</b>	20 APR	21 APR
24 APR		25 APR	<b>26 APR FINAL EXAM</b>	27 APR	28 APR

# HOMEWORK

The list of homework problems is as shown below. Try to solve all assigned problems.

Chapter 1:

Sect. 1.1: Page 5: 1-12, 13, 15, 16.

Sect. 1.2: Page 13: 1, 2, 3, 5, 9, 13, 15, 21, 22, 25, 26, 31.

Sect. 1.3: Page 21: 1, 2, 7, 11, 13.

Chapter 2:

Sect. 2.2: Page 43: 1, 4, 5, 7, 10, 15, 17, 18, 21, 23, 28, 31.

Sect. 2.3: Page 51: 1, 3, 5, 7, 10, 15, 17, 19, 21, 25, 27.

Sect. 2.4: Page 61: 1, 3, 5, 7, 9, 11, 13, 16, 21.

Sect. 2.6: Page 74: 1, 3, 4, 9, 11, 21, 23, 29.

Chapter Two Review: Page 77: 1, 3, 5, 7, 9, 11, 13, 17, 19, 23, 33, 35, and 37.

Chapter 3:

Sect. 3.2: Page 99: 1, 3, 5, 7, 9, 11, 13, 14, 15, 23, 25.

Sect. 3.4: Page 114: 1, 5, 7, 12, 24, 25.

Sect. 3.5: Page 121: 1, 3, 5, 7.

Chapter 4:

Sect. 4.1: Page 157: 3, 5, 7.

Sect. 4.2: Page 165: 3, 7, 9, 13, 15, 20, 27, 29.

Sect. 4.3: Page 173: 1, 3, 7, 9, 16, 23, 27, 29.

Sect. 4.4: Page 182: 1, 3, 5, 7, 9, 13, 19, 23, 27, 29

Sect. 4.5: Page 187: 1, 3, 5, 7, 11, 13, 17, 19, 25, 29, 31, 33, 37, 43.

Sect. 4.6: Page 193: 1, 3, 5, 7, 9, 11, 13.

Sect. 4.7: Page 200: 1, 3, 5, 7, 9, 13, 15, 17, 19, 29, 31, 33, 37, 39.

Sect. 4.9: Page 222: 1, 3, 5, 7.

Sect. 4.10: Page 230: 3, 9, 11, 13

Chapter 4 Review: Page 233: 1–36 odd

Chapter 5: (If time permits)

Sect. 5.2: Page 250: 3, 5, 13, 17, 19, 21, 23, 31

Sect. 5.7: Page 291: 1, 3, 5, 11

Chapter 5 Review: Page 308: 1, 3, 7. (If time permits)

Chapter 7

Sect. 7.2: Page 360: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25.

Sect. 7.3: Page 365: 1, 3, 5, 7, 9, 11, 13, 15, 21, 24, 25, 33, 35

Sect. 7.4: Page 374: 1, 3, 5, 7, 9, 11, 13, 15, 17, 21, 23, 25, 33, 35

Sect. 7.5: Page 382: 1, 3, 5, 7, 9, 11, 13, 15, 17, 21, 23, 25, 31, 32, 35.

Sect. 7.6: Page 393: 1, 3, 5, 7, 9, 11, 13, 15, 17, 21, 23, 25, 31, 32, 35, 39, 49, 51, 57.

Sect. 7.7: Page 403: 1, 3, 5, 7, 9, 11, 13, 17, 19, 23, 25, 27.

Sect. 7.8: Page 410: 1, 3, 5, 7, 9, 11, 13, 15, 17, 21, 23, 25, 27, 29.

Chapter 7 Review: Page 416: Problems 1–25 odd, 29.

Chapter 8: (If time permits)

Sect. 8.1: Page 426: 1, 3, 5, 7, 13, 15.

Sect. 8.2: Page 434: 1, 3, 5

Sect. 8.3: Page 445: 1, 3, 5, 7, 9, 11, 13, 15, 25, 27, 35

Sect. 8.4: Page 450: 1, 3, 5, 7, 9, 11, 13, 15, 21, 23

Chapter 8 review: Page 491: Problems 1–6, 9. (If time permits)

## EXAMS

There will be four class exams (25 points each) and a final exam (25 points).

Only three best scores of class exams will count.

Hence Final grade will be (three best scores of class exams + Final exam).

The dates and times of the class exams appear in the course calendar.

All exams will take place in the usual classroom Little 113.

The final exam will be on Wednesday, April 26th, 03:00 P.M.–05:00 P.M.

No make-up exams will be given except for documented special reasons, such as medical emergencies. Exams can be rearranged for student athletes only if I am notified at least three weeks in advance. It is the responsibility of each student to make sure that he or she is available to take every exam or, in the allowable cases, to inform me as soon as possible so that alternative arrangements can be made.

If you think that a score has been **computed incorrectly**, please bring the matter to my attention within one day of your work being returned.

If you think that your work has been **graded incorrectly**, please submit an appeal in writing within seven days of your work being returned, explaining your reasons in detail. Appeals may result in a higher, unchanged, or lower score, depending on the merit of the appeal. Decisions on appeals are final. The final exam cannot be appealed.

## GRADING SCALE

**Grades: A : 90-100**  
**A- : 87-89**  
**B+ : 83-86**  
**B : 78-82**  
**B- : 75-77**  
**C+ : 70-74**  
**C : 65-69**  
**C- : 60-64**  
**D : 50-59**  
**E : 0-49**

The UF regulations on grades are here: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

The UF policy on minus grades is here: <http://www.isis.ufl.edu/minusgrades.html>.

## CLASS ATTENDANCE POLICY

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalog at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

## SPECIAL ACCOMMODATIONS

Students requesting classroom accommodation must first register with the Dean of Student Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation.

## HONOR CODE

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obliged to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor of this class.

## COURSE EVALUATIONS

Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

Disclaimer: I reserve the right to change the above policies if situations warrant.