



map2302-syllabus

Map 2302

Section 3228 Fall 2020

Instructor

Scott McCullough

Course Content and Objectives

Differential Equations are ubiquitous in the sciences and engineering. This course is designed to serve students in engineering, physics, mathematics and related disciplines with the aim of understanding qualitatively, applying, and solving ordinary differential equations of the most usual types.

The course starts with an introduction to the concept of differential equations. It covers first order methods, including separability, exactness, integrating factors, first order linear equations, Bernoulli's equations, and second order equations reducible to first order ones.

The course continues with higher order methods for constant coefficient linear equations including particular solutions by the method of annihilators and undetermined coefficients, as well as the theory of linear ordinary differential equations.

The course also covers Laplace transform methods, including properties of the Laplace transform and solution of initial value problems via the Laplace transform. Series solutions will be covered as time permits.

Some applications, from such areas as mechanics and electrical circuits, will be covered.

Text book

Fundamental of Differential Equations and Boundary Value Problems, 7th edition by Nagle, Saff and Snider.

If you do not intend to use this book for any future mathematics courses, there are a number of lower cost options.

Per the publishers web site, **with – or without – boundary values**, the 9th edition of *Fundamental of Differential Equations* consists of the first 10 chapters of the 7th edition of *Fundamentals of Differential Equations and Boundary Value Problems* and is suitable for this course. In the past this 9th edition has been available as an ebook, at reduced cost. See below.

Either the 5th edition of the with boundary values version; or 7th edition without the boundary values will be supported. They are available used.

An eversion of the text is also available: This course is participating in the UF All Access program. Login at the following website and Opt-In to gain access to your required course materials – <https://www.bsd.ufl.edu/G1CO/IPay1f/start.aspx?TASK=INCLUDED> – UF All Access will provide you with your required materials digitally at a reduced price and the ability to pay using your student account. This option will be available starting 1 week prior to the semester starting and ending 3 weeks after the first day of class.

If you are unsure, during our first class meeting we will discuss the textbook options.

Suggested Problems

Selected problems from the text will be assigned on a daily basis.

Exams.

There will be four mid-term exams, each worth 100 points. There will be no make-up exams, rather a replacement for any one mid-term can be taken at the time scheduled for the final.

Exam 1. Wednesday 23 September.

Exam 2. Friday 16 October.

Exam 3. Monday 9 November.

Exam 4. Monday 7 December.

Makeup exams. Wednesday 16 December, 3-4:10pm.

Grading

A course total will be computed by adding the exam scores. Grades will then be assigned according to the scale:

90 A
87 A-
83 B+
80 B
77 B-
73 C+
63 C
57 D

Attendance

Attendance is recommended.

Additional Information:

Grades. Grading will be in accord with the UF policy stated at <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>. Also see the current UF policy on assigning grade points.

Academic Honesty. The course will be conducted in accordance with the University honor code and academic honesty policy

*UF students are bound by The Honor Code 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** specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have questions or concerns please consult with the instructor.*

Accommodation for students with disabilities. Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc/>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Online Evaluations. "Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations 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/>."

Additional Information- Health and Wellness:

U Matter, We Care:

If you or a friend is in distress, please contact ummatter@ufl.edu or 352-392-1575 so that a team member can reach out to the student.

Counseling and Wellness Center:

<https://www.counseling.ufl.edu>; 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS):

Student Health Care Center, 392-1161.

University Police Department:

392-1111 or 9-1-1 for emergencies, <http://www.police.ufl.edu/>

Additional Information- Academic Resources:

E-learning technical support

352-392-4357 (option 2)

Learningsupport@ufl.edu

Career Connections Center:

Reitz Union, 392-1601.

Career assistance and counseling, <https://career.ufl.edu>

Library Support:

<http://cms.uflib.ufl.edu/ask>

Additional Information- Diversity Statement:

The Mathematics Department is committed to diversity and inclusion of all students. We acknowledge, respect, and value the diverse nature, background and perspective of students and believe that it furthers academic achievements. It is our intent to present materials and activities that are respectful of diversity: race, color, creed, gender, gender identity, sexual orientation, age, religious status, national origin, ethnicity, disability, socioeconomic status, and any other distinguishing qualities.

Tentative weekly schedule (TBA)

Week 1: Introduction.

Week 2: Directions fields, Euler's method.

Weeks 3 and 4: First order equations.

Week 5. Applications and numerical methods.

Weeks 6, 7 and 8. Second order linear equations; applications.

Week 9. Systems and phase plane analysis.

Weeks 10 and 11. Higher order linear equations.

Weeks 12 and 13. Laplace transforms.

Week 14. More Laplace transforms or Series solutions as time permits.

Week 15. Exam 4, course wrap up, reading day.



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