



# map2302-syllabus

## Map 2302

Section 022H Spring 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 undetermined coefficients. It includes variation of parameters, operator methods, linear independence and the Wronskian.

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.

Other textbook options are discussed on the course homepage.

### **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, Friday 31 January.

Exam 2, Monday 24 February.

Exam 3, Friday 27 March.

Exam 4, Monday 20 April.

Make-ups, Tuesday 30 April, 10-11am.

### **Grading**

A course total will be computed by adding the exam scores. Grades will then be assigned according to a straight scale: 90 A; 87 A-; 83 B+; 80 B; etc.

### **Attendance**

Attendance is recommended.

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### **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, commit ourselves to hold ourselves and our peers to the highest standards of honesty and*

*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](mailto: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](mailto: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>

### **Tentative weekly schedule (TBA)**

Week 1: Introduction.

Week 2: Direction 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.

