University of Florida

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College *of* Liberal Arts *and* Sciences

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MAP 2302 Elementary Differential Equations (Classes ## 14889/27190, Sections 3151/9824)

Time and Location: MWF period 8, in Zoom.

Final Exam Time and Room: April 28, 3:00 – 5:00 pm in Zoom.

Office hours: M10, W10 (in Zoom) and by appointment. The students are also welcome to call me or use e-mail rudyak@ufl.edu for communication.

Zoom Meeting ID is 2844101326

Description, Content, and Goals

MAP 2302 is a 3 credit course which gives the basic elementary knowledge necessary for understanding, applying, and solving differential equations of the most usual types (Chapters 1, 2, 4, 6, and 7 of the text). The purpose of this course is to introduce the student to the study of ordinary differential equations, which are used to describe the evolution and behavior of natural processes in most fields of scientific endeavor, from physics and engineering to economics and sociology. The course starts with the concepts of differential equation, its solution, direction field, initial value problem and Euler's method. The next chapter 2 covers certain important classes of ordinary

differential equations of first order. Methods of solutions include separability, exactness, integrating factors, first order linear equations, Bernoulli's equations, and homogeneous equations. The course continues with second order linear equations methods (Chapter 4). Mainly, we consider linear equations with constant coefficient, including particular solutions and general solutions by the method of undetermined coefficients and the method of variations of parameters. We also cover some applications of differential equations to mathematical modelling such as mass-spring oscillators and electrical circuits. In Chapter 6 we generalize methods of results of Chapter 4, via discussing linear differential equations of higher orders. Chapter 7 covers Laplace transform methods, including properties of the Laplace transform, solution of initial value problems, and applications. In Chapter 8 (Sections 8.1-8.4) we study some power series methods to solve ordinary differential equations.

Literature: Nagle, Saff, and Snider: *Fundamentals of Differential Equations, 7th or 8th Edition,* Addison-Wesley is an imprint of Pearson.

A Video Lecture Course (this is not an obligation, just I like it):

http://ocw.mit.edu/courses/mathematics/18-03-differential-equations-spring-2010/video-lectures/

Quizzes, Midterm Exams, and Final Exam

We will have 3 Quizzes, each Quiz worth 15 points, and 2 Midterm Exams, each Midterm Exam worth 20 points. I will drop the worst one from Quizzes. We have final (cumulative) exam that worth 30 points. So, 100 points together. No formula sheet, no notes, no book, no any kind of electronic devices are allowed on quizzes and midterm exams. However, the Laplace transform table is allowed. For the final exam, one formula sheet (A4 format, two sided) written by yourself, no Xerox, no torn book pages, etc. are allowed. Homework assignments are not graded, but it is essential that you do them thoroughly in order to be in a position to do well on the tests.

Tentative Schedule of Tests:

Quiz 1, 2/8, covers Sections 1.2,1.3 and 2.2-2.6.
Quiz 2, 3/1 covers Chapter 4.
First Midterm Exam, 3/17, covers Chapter 6.
Quiz 3, 4/4, covers Sections 7.1-7.6.
Second Midterm Exam, 4/16, covers Sections 7.1-7.9.
Final Exam, 4/28, Comprehensive.

Grading Scale

The total score of the student is equal to the sum of points (nothing about percentage). The resulting score determines the letter grade according
to the following table (minus grades will not be used for letter grades):

Letter Grade	A	B+	B	C+	C	D+	D	E
Score	100>>90	89>>85	84>>79	78>>73	72>>67	66>>60	59>>54	53>>0

Course Policies

·   **University's honesty policy**: 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 obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

·   **University of Florida Complaints Policy**: The University of Florida believes strongly in the ability of students to express concerns regarding their experiences at the University. The University encourages its students who wish to file a written complaint to submit that complaint directly to the department that manages that policy.

A student who is unsure as to the official responsible for handling his or her particular complaint may contact the Ombuds office or the Dean of Students Office. For complaints that are not satisfactorily resolved at the department level or which seem to be broader than one department, students are encouraged to submit those complaints to one of the following locations:

Ombuds: http://www.ombuds.ufl.edu/

31 Tigert Hall, 352-392-1308

The purpose of the Ombuds office is to assist students in resolving problems and conflicts that arise in the course of interacting with the University of Florida. By considering problems in an unbiased way, the Ombuds works to achieve a fair resolution and works to protect the rights of all parties involved.

Dean of Students Office: http://www.dso.ufl.edu/

202 Peabody Hall, 352-392-1261

The Dean of Students Office works with students, faculty, and families to address a broad range of complaints either through directly assisting the student involved to resolve the issue, working with the student to contact the appropriate personnel, or referring the student to resources or offices that can directly address the issue. Follow up is provided to the student until the situation is resolved.

Additionally, the University of Florida regulations provide a procedure for filing a formal grievance in Regulation 4.012: http://regulations.ufl.edu/regulations/uf-4-student-affairs/

·   **Make-up.** If a student misses a test and is willing to make-up the test, s/he must submit an excusable documentation from a doctor, or the Dean of Students, or other official persons. If you do not have an excuse document, I allow you to make up the test, but with a penalty (no bonus: 5 problems instead of 6, and subtract 3 points from the student result).

.   **Exemptions.** If a student gets a perfect score (70 points, 2 quizzes and 2 exams) before the final exam, the student get the letter grade A without taking the final exam.

·   **Concerning students with disability.** Students requesting classroom accommodation must first with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

·   **Information** on current UF grading policies for assigning grade points.

This may be achieved by including a link to the web page: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx.

·   **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/

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