Syllabus for DIFFERENTIAL EQUATIONS

Jonathan L.F. King
University of Florida, Gainesville FL 32611-2082, USA
squash@ufl.edu
Webpage http://squash.1gainesville.com/
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Course: MAP3302, section 2362

Instructor: *Prof. Jonathan King*

Room: TUR2346.   Office: *402 Little Hall*

MWF, 8th period   *Tel.: 392-3201*

Office Hours: *9th period on Wed, 6th on Fri*

Text: "Elementary differential equations and boundary value problems", by W. Boyce & R. DiPrima.

Overview.

a: Introduction to concept of differential equations. First order methods, including separability exactness, integrating factors, first order linear equations, Bernoulli's equations, and second order equations reducible to first order ones, applications, including mechanics. Chapters 1 and 2.

b: Higher order methods for constant coefficient linear equations including particular solutions and general solutions by undetermined coefficients. Variation of parameters operator methods, linear independence and Wronskian, applications, vibrating springs, resonance, electrical circuits. Chapters 3 & 4.

c: Chapter 5. Laplace transform methods. Properties, solution of initial value problems and applications. Chapter 6.

Notebook.
Please obtain a looseleaf notebook in which to place all hand-outs, your exams, solution sheets, and other materials. I recommend that you bring your text to each class; certainly bring the notebook.

Quizzes and other opportunities to show off.
Currently, my intention is to have 3 short in-class exams and a final in-class exam.

The computer.
I'll arrange that every student be given a math dept. computer account. We'll have a least one session in the computer lab to learn how to use email, and how to experiment with one of our programs that can work with differential equations.

Homework.
Homework assigments will usually be distributed by email. I'll collect homework every Monday. Sometimes I'll grade all of the homework, sometimes just one problem, and sometimes we'll simply do the problems in class. Please write problem numbers as in "12*P28*", which means problem 12 on page 28 of our text.

Grades.
I'll hand out a sheet later in the week with exam dates as well as the percentage each exam counts. Class participation and homework will count for about 10%–15%.

BOOKS TO INSPIRE A DELIGHT IN MATHEMATICS.
Mathematical Plums, Ross Honsberger. QA7.M34447
MATHEMATICAL GEMS (I, II, III) Ross Honsberger. QA 241 .H63
MATHEMATICAL CIRCLES REVISITED and MATHEMATICAL CIRCLES SQUARED, both by Howard Eves.

Conclusion.
You are welcome –indeed, encouraged– to work on homework problems together. I may assign some communal homework projects. Differential equations is a fascinating subject.

When reading science articles in the newspaper or textbooks in scientific subjects, keep your eyes open for examples where differential equations were used to solve a real-world problem. Then bring this example to class —and teach me something!

J. King

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