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The Course: The book we shall use for this course is entitled *Elementary Differential Equations, eighth edition* by Boyce and DiPrima. During the semester we will cover parts of

- Chapter 1: Introduction
- Chapter 2: First Order Differential Equations
- Chapter 3: Second Order Linear Equations
- Chapter 4: Higher Order Linear Equations
- Chapter 6: The Laplace Transform

If there is more time at the end of the semester I will consider covering also parts of Chapters 5 and/or 7.

Course Overview: Historically differential equations have been used to describe natural phenomena such as falling objects, the flow of electricity, and the vibration of objects. In Chapter 2 we study first order differential equations (DE). Methods are given for solving linear, separable, and exact DE. Applications of first order DE are given to velocity, electricity, fluid flow, and interest compounding. In Chapter 3 we first investigate homogeneous second order differential equations with constant coefficients and after that consider several methods (undetermined coefficients, variation of parameters) for solving nonhomogeneous second order DE. Applications are given of second order DE to mechanical and electrical problems. In Chapter 4 we investigate higher order DE and give some applications of these equations. This chapter is similar to Chapter 3 only somewhat more involved. In Chapter 6 we introduce the Laplace transform and study some of its properties. We then use the Laplace transform to solve DE, including DE with discontinuous forcing functions and impulse functions. Chapter 7 is concerned with solving systems of DE while Chapter 5 uses power series to solve second order DE with nonconstant coefficients.

Tests: There will be three tests during the semester and a final test at the end of the semester. Tests will be given at the following times:

First Test: Friday September 24 (in class)

Second Test: Friday October 22 (in class)

Third Test: Friday November 19 (in class)

Final Test: Monday December 13, 10:30 am - 12:30 pm (in class)

Homework: Suggested homework problems will be assigned in class and generally discussed the next period. Homework will not be collected, but a homework quiz (worth 15 points) will be given each Friday except on the weeks we have tests (beginning on September 3). At the end of the semester, your seven highest homework quiz scores will be counted as one test (actually 105 points). Makeups for quizzes will not be given for any reason.

Important Dates:

Monday, September 6 - No class (Labor Day)
 Friday, November 4, last day to withdraw in this course without a grade
 Wednesday November 24 - Friday November 26 = Thanksgiving break
 Friday, December 10 = End of classes

Grades: Points will be given as follows:

Hour Tests = 300
 Final Test = 125-150
 Quiz Scores = 105

At the end of the semester each students points will be added and his/her percentage of the total points will be calculated. You are guaranteed that if your percentage is the university standard, then you will get at least that grade:

- 90-100 percent = A
- 80 - 89 percent = B
- 70 - 79 percent = C
- 60 - 69 percent = D
- 0 - 59 percent = E.

However there may also be a slight curve given after the percentages are figured.

Calculators: Calculators are allowed. You may use whatever level of technology you want, but on tests you will be expected to show your work which means convince me that you know how to integrate, differentiate and in general solve differential equations. Credit will not just be given for an answer !

Online Support A copy of this syllabus along with future review sheets for tests may be found under MA 214 at <http://www.ms.uky.edu/~john/index.html>

The following homework problems are recommended for you to work on. Quiz problems will be chosen from this homework.

Suggested Problems MA 214 (not to hand in)

Integration Review	Problem 2
Section 1.3 (page 24)	3, 5, 9, 13
Section 2.1 (page 39)	7(c), 15, 19, 25(b),(c)
Section 2.2 (page 47)	5, 16(a), 18(a), 31(a),(b), 37(a),(b)
Section 2.3 (page 59)	2, 4, 7, 10, 13, 16, 23(a), (b)
Section 2.4 (page 75)	3, 9, 28, 30, 32
Section 2.6 (page 99)	4, 9, 14, 27
Section 3.1 (page 142)	3, 7, 9, 15, 18
Section 3.2 (page 151)	2, 5, 10, 13, 26
Section 3.3 (page 158)	2, 3, 4, 17, 18
Section 3.4 (page 164)	8, 12, 17, 19
Section 3.5 (page 172)	2, 12, 14, 24, 28