

Syllabus for MA214 Calculus IV/Ordinary Differential Equations

University of Kentucky, Spring 2012

Time and place:

Section 011: MWF 10:00-10:50 a.m., FB213

Course instructor and contact information:

Instructor: Dr. Alan Demlow, Associate Professor of Mathematics

Office: POT 775, phone 257-6797

E-mail: alan.demlow@uky.edu

Office hours: Office hours will be held in my office, POT775, Tuesdays 9:45-10:45, Wednesdays 2-3,, and Fridays 2-3. You are also welcome to e-mail me for an appointment at other times or drop by my office any time the door is open.

Course website: The course website will be linked to from <http://www.ms.uky.edu/~demlow/>.

Textbook: *Elementary Differential Equations* (8th Edition, custom edition for the University of Kentucky available), by William E. Boyce and Richard C. DiPrima.

Course overview: Ordinary differential equations (ODE) have long been a fundamental part of the mathematical vocabulary used to describe natural phenomena. ODE have been studied using a wide range of tools and techniques. These include:

1. Classical attempts to find exact solution formulas;
2. Numerical methods which yield precise but approximate quantitative information about solutions;
3. Qualitative methods which provide a less precise, but very rich, geometric understanding of ODE.

The theoretical portions of the course emphasize exact solution techniques, and we will also use computer lab assignments to explore numerical and qualitative methods. Core material for the course includes most of Chapter 1 (Introduction), Chapter 2 (First-order differential equations), Chapter 3 (Second-order linear equations), and Chapter 6 (The Laplace transform).

Homework: There will be roughly 11 weekly homework assignments consisting of problems from the textbook. Assignments will be posted on the course and will be due by 4 p.m. each Friday. Homework may be turned in during class, to my office in POT775, or to my mailbox in POT715. I will select a few of the assigned problems to grade each week (roughly one for each section in the book), but you are required to complete all assigned problems. You are encouraged to work with others while solving homework problems, but you must write up your own solutions. Late homework will not be accepted except in cases of excused absences (see the "attendance" section below). However, your two lowest homework scores will be dropped. Homework will be worth 12% of your final grade.

Computer lab assignments and projects: The course includes a lab component using the MatLab ODE package IODE developed at the University of Illinois. There will be four projects during the semester that are to be completed outside of class and handed in. The four projects, plus possibly the additional in-class lab, will constitute 12% of your final grade.

Exams: There will be two 50-minute in-class exams during the semester (each worth 20% of your final grade) and a final exam (worth 36% of your final grade). The exam schedule with an approximate breakdown (both subject to change) of material covered on each is:

Prelim 1:	Friday, Feb. 24	Chapter 1, Chap. 2, Sec. 3.1
Prelim 2:	Friday, April 6	Sec. 3.2-3.9
Final Exam:	Monday, April 30, 1 p.m.	Comprehensive

Makeup exams are allowed only for sanctioned university activities or legitimate emergencies and only with written documentation (see "Attendance" below). If you feel that your situation warrants a makeup exam, please check with your instructor as soon as possible to request one.

Accommodations due to disability: If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, jkarnes@email.uky.edu) for coordination of campus disability services available to students with disabilities.

Grading: Your final grade will be determined by your composite homework score for the semester (12%), your computer lab/project grade (12%), your 2 prelims (40% of your grade, or 20% for each prelim), and your final exam (36%). I will use a standard grading scale (90-100% A, 80-89% B, etc.). Individual grade components and overall course grades may be curved up (but not down) in order to ensure a fair distribution of grades.

Calculators and software: The IODE package used for our projects uses numerical techniques to approximately solve ODEs. There are many other software options available for solving ODEs, some of which use numerical techniques like IODE and others of which able to give exact solutions to many classes of problems symbolically (Maple and Mathematica). As you do your homework during the course of the semester, you are encouraged to explore these software options and use them to check your pencil-and-paper answers, and you may occasionally be assigned homework problems which require you to use one of them. However, **no electronic aids (computers or calculators) will be allowed on exams.**

Attendance: Attendance is required, and you are responsible for all lecture material and announcements made in class. However, lecture attendance will not be recorded. Legitimate reasons for missing class include serious illness, illness or death of a family member, university-related trips, and major religious holidays. Students asking for makeup exams or extensions of written homework due dates should let me know of any conflicts as soon as possible (but in any case no more than a week after the absence) and be prepared to provide written documentation.

Academic integrity: Violations of academic integrity will be taken seriously and dealt with according to university regulations. Instances of cheating on exams include (but are not limited to) copying from or communicating with another student, bringing any kind of notes into the exam unless expressly permitted, and using any type of electronic aid. You are encouraged to work together on homework and projects, but you are required to write up and submit your own solutions to all assignments. Students caught cheating will be prosecuted according to university guidelines.

Classroom Decorum: Students are expected to be attentive and courteous during class. During class, please put away newspapers, turn off cell phones, and refrain from using laptops or other electronic devices except for note-taking purposes.

MA 310 Section 001 Problem solving for teachers

MWF 2:00-2:50pm in 345CB

Instructor: Ed Enochs

POT749

(859) 257-6790

enochs@ms.uky.edu

Office hours 3-4pm on MWF, but I will be available most TR's 9-4

Text: There is no required text. But the book *Mathematics-The Music of Reason* by Jean Dieudonné is recommended. You should be able to get a reasonably priced copy on amazon.com.

Goals: You will be exposed to a variety of mathematical ideas. These could include counting problems, the principle of induction, infinite cardinal numbers, infinite ordinal numbers, ruler and compass constructions and a variety of other ideas. So the hope is that you will improve your problem solving skills and also broaden your mathematical horizons.

Grades: Your grades will be based on tests, a final exam, solutions you hand in and class participation. The in-class tests will be given on Friday, February 3, on Wednesday, March 7, and on Friday, April 20. The final will be at 8am on Friday, May 4. You should expect to hand in homework about once a week. Class participation includes attendance, possibly presenting solutions at the board and overall effort.

Percentages: Tests 50%, Final 15%, Homework 25% and Participation 10%.

Working on problems together is encouraged. But when you hand in solutions you should try to make sure that your contribution is reasonably substantive.

Please-if you need to use your cellphone or laptop, do so outside the classroom.