SYLLABUS
Elementary Differential Equations
Math 266/267
Summer 2014

Instructor: Paul Tokorcheck
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Office Location: 443 Carver Hall
Office Hours: Mon/Thurs 1:30 – 2:30pm, or by appointment.

Lecture: MTWRF 12:10–1:30pm, Carver 0202

Course Description: Solution methods for ordinary differential equations. First order equations, linear equations, constant coefficient equations. Eigenvalue methods for systems of first order linear equations. Introduction to stability and phase plane analysis. Math 267 is the same as 266 but also including Laplace transforms and series solutions to ordinary differential equations.

Prerequisites: Minimum of C- in Math 166 or Math 166H.

Text: Either of the following versions is fine. They are identical except for the 3 additional chapters in the former, that we will not use.


Homework: Homework will be collected every Friday, at the start of lecture. On either Blackboard or the course website you will find a list of recommended textbook problems. You are asked to turn in the problems indicated in red.

Exams: Each exam will consist of exercises chosen from the list of recommended textbook problems. If you cannot be there on the date of an exam, you must contact me before the exam date to make other arrangements. If you no-show for an exam and attempt to contact me afterward, you should not expect to be allowed a make-up exam.

Last Updated: May 11, 2014
Quizzes: Every Friday in which we do not have an exam, we will take a short, two-question quiz. The quiz questions may or may not come from the textbook. Math 266 will take 4 quizzes, and Math 267 will take 5. As with the exams, if you need to miss a quiz, you must notify me ahead of time, and have a legitimate reason.

Grading for Math 266: Your grade for the course will be calculated as follows:

- Attendance: 10% (as a percentage of total days)
- Homework: 18% (3% each)
- Quizzes: 28% (7% each)
- Exams: 44% (22% each)

Grading for Math 267: Your grade for the course will be calculated as follows:

- Attendance: 10% (as a percentage of total days)
- Homework: 20% (2.5% each)
- Quizzes: 25% (5% each)
- Exams: 45% (15% each)

Policy on academic dishonesty: Don’t cheat. If you have questions about what constitutes “cheating”, or what will happen if you are caught, please review the University’s policy on academic dishonesty at [http://www.public.iastate.edu/~catalog/2009-2011/geninfo/dishonesty.html](http://www.public.iastate.edu/~catalog/2009-2011/geninfo/dishonesty.html)

Policy on disabilities: Please address any special needs or special accommodations with me at the beginning of the semester or as soon as you become aware of your needs. Those seeking accommodations based on disabilities should obtain a Student Academic Accommodation Request (SAAR) form from the Student Disability Resource (SDR) office (phone 515-294-7220). SDR is located on the main floor of the Student Services Building, Room 1076. Please also review the Mathematics Department Student Disability Accommodation Policy at [http://www.math.iastate.edu/Undergrad/AccommodationPol.html](http://www.math.iastate.edu/Undergrad/AccommodationPol.html)
**Course Calendar:** We will cover the following sections of your textbook, on roughly the weeks listed. This calendar is very tentative.

**Week 1:** Introductions and basic definitions. Initial value problems, direction fields, and separable equations. Linear and exact equations. (1.1 – 1.4, 2.1 – 2.4)

**Week 2:** Substitutions. Some applications and modeling. Homogeneous second-order linear equations. (2.6, 3.1 – 3.3, 4.1, 4.2)

**Week 3:** More complex second-order equations. The method of undetermined coefficients, and variation of parameters. (4.3 – 4.6) **Exam 1 on Friday.**

**Week 4:** Free and forced mechanical vibrations. Ideas about higher-order equations. Systems of differential equations, the elimination method. (4.9, 4.10, 6.1 – 6.3, 5.1, 5.2)

**Week 5:** The phase plane. Basics of Linear Algebra for solving linear systems. The use of eigenvalues. (5.4, 9.1 – 9.6)

**Week 6:** Nonhomogeneous linear systems and the matrix exponential function. (9.7, 9.8) **Exam 2 on Friday. Math 266 ends.**

**Week 7:** The Laplace transform and the inverse transform. Convolution. (7.1 – 7.8)

Week 8: Taylor approximation and power series. Analytic functions. Series solutions to differential equations. (8.1 – 8.3) **Exam 3 on Friday.**