

SYLLABUS

MATH 333 — DIFFERENTIAL EQUATIONS WITH MATRIX THEORY
Section 001, BSU, Spring 2012

INSTRUCTOR: Jens Harlander
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OFFICE: MG 236 B

OFFICE HOURS: Tuesday and Wednesday 12noon - 1:30PM. In addition I will be available for questions every day after class outside the classroom.

COURSE INFORMATION: Assignments, announcements and documents for this course will be posted on Blackboard.

CLASS MEETINGS: MTuWeFr 8:40AM - 9:30AM, Engineering Building, Room 110.

PREREQUISITES: Math 175. This course requires a solid foundation in the calculus of functions of a single variable: differentiation and integration are both central to this class.

TEXTBOOK: *Differential Equations: an Introduction to Modern Methods and Applications*, Brannan & Boyce; Wiley, 2nd ed., 2011. In addition you need access to WileyPLUS for online homework assignments.

IMPORTANT DATES: Important dates such as last day to drop without a W etc. can be found on the academic calendar.

Course Overview and Learning Objectives

Math 333 is an introduction to differential equations whose solutions are functions of a single variable. The main objects of study are first order equations, second order linear equations and systems of first order equations. Roughly speaking, we will discuss three main methods of deriving information about solutions to these: analytic, qualitative and numerical methods. Analytic methods involve finding explicit solutions to equations. Qualitative methods are used to gain information about solutions without explicitly solving an equation. Numerical methods are used to approximate a solution.

We will also cover basic matrix theory and see how it can be applied to solving systems of linear algebraic equations and systems of linear differential equations.

By the end of this course, you should be able to:

- Define what constitutes a solution to a differential equation, and recognize when a given function is a solution to a particular equation.
- Classify differential equations according to various criteria and, where applicable, identify and implement techniques that can be used to find explicit solutions.
- Employ qualitative analysis to gain information about solutions to equations without explicitly solving them.
- Use matrix theory to solve systems of linear algebraic equations and systems of linear differential equations.
- Construct and interpret models involving differential equations for a number of physical processes.

Evaluation

- EXAMS (40%). There will be three midterm exams. Make-up exams will be granted at my discretion, and only for verifiable reasons.

EXAM DATES:

Midterm 1: Friday, February 24

Midterm 2: Friday, March 23

Midterm 3: Friday, April 27

- FINAL (20%). The final exam will be cumulative. It will take place Wednesday, May 9, 8AM - 10AM, in our classroom.
- QUIZZES (20%). Quizzes will be given on Fridays. The lowest quiz score will be dropped. There will be no make-up quizzes.
- HOMEWORK (20%). There will be daily online homework assignments and weekly assignments collected Fridays. Late homework will not be accepted.

GRADING SCALE: The default grading scale is: 90%–100% an A, 80%–89% a B, 70%–79% a C, 60%–69% a D and below 60% an F. I reserve the right to assign “pluses” or “minuses” to letter grades within these ranges. Any changes to this scale will be such that a higher letter grade is assigned to a lower percentage.

Calculators

You will be allowed to use a scientific calculator for quizzes and exams. The use of graphing calculators will not be permitted.

Academic Honesty

It is your responsibility to be familiar with BSU's policies regarding academic honesty.

Requests for Academic Accommodations

Students who plan to request academic accommodations should arrange to meet with me early in the semester. Students making such requests are required to provide documentation from the Disability Resource Center, located in room 114 of the Administration Building.