

COURSE DESCRIPTION
INTERMEDIATE DIFFERENTIAL EQUATIONS
MA 454/554–2D

DEPARTMENT OF MATHEMATICS
UNIVERSITY OF ALABAMA AT BIRMINGHAM

Course Instructor: Rudi Weikard
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Office Hours: TT 2:00 pm – 3:00 pm and by appointment.

Meeting times: TT 12:30 pm — 1:45 pm
Meeting location: UH 2013
Prerequisite: Grade of C or better in MA 252 or equivalent
Credits: 3 semester hours
Textbook: *A Second Course in Elementary Differential Equations* by Paul Waltman, Dover, 2004.

Important dates:

First day of classes: January 13
Last day to drop without paying full tuition: January 21
Last day to withdraw with a “W”: March 13
Spring Break: March 16 – 22
Last day of classes: April 24
Major exams: February 25 and April 21 (dates are tentative)
Final exam: April 30, 10:45 am – 1:15 pm

Course policies:

- Please make sure that you are able to receive e-mail through your Blazer-ID account. Official course announcements may be sent to that address.
- If you are contacted via the Early Alert Program, you should consider taking advantage of the services it offers. Various services to assist you are also listed at <https://www.uab.edu/students/home/services>.
- If you wish to request a disability accommodation please contact DSS at 934-4205 or at dss@uab.edu.
- The two lowest quiz grades will be dropped to account for any missed assignments due to illness or any other circumstance.
- If a test is missed due to a serious verifiable circumstance or official university business, the test grade will be replaced with the properly rescaled

Date: January 3, 2020.

final exam score. You have to advise the instructor of such circumstances at the earliest possibility.

- You are allowed to use your book and notes for any of the exams but not for the quizzes.
- Class attendance is expected. If you need to leave class early, it is polite to tell the instructor before the class starts.

Methods of teaching and learning:

- 28 class meetings of 75 minutes consisting of investigations and discussions of concepts, examples and problems. Time for two in-class tests is also included.
- Students are expected to undertake at least 8 hours of private study and homework per week.

Aims of the course:

The course aims for students to attain *conceptual understanding* and *procedural fluency* with regard to the following items:

- linear systems of differential equations, in particular those with constant coefficients;
- the concept of stability in the investigation of the qualitative behavior of two-dimensional systems;
- existence and uniqueness questions of solutions of systems of differential equations;
- boundary value problems, in particular the Sturm-Liouville problem;
- important concepts from analysis.

Conceptual understanding is demonstrated by the ability to solve pertinent problems related to that concept, even if these problems were not explicitly covered in class. *Procedural fluency* is demonstrated by exercising routine problems in an assured and timely fashion.

The course also emphasizes *critical thinking* and *communication skills*, both written and verbal.

Course content:

- Systems of linear differential equations
- Two-dimensional autonomous systems
- Existence theory
- Boundary value problems

Assessment procedures:

- Student achievement will be assessed by the following measures:
 - Frequent unannounced quizzes based on previously assigned homework and contributing 20% to the course average. Many problems on tests are modeled after homework problems. Staying on top of homework is therefore extremely important.
 - Two 75-minute exams in class. Partial credit is awarded where appropriate. Each test contributes 20% to the course average.
 - A 150-minute comprehensive final examination. The final contributes 40% to the course average.

- Your course performance is the maximum of your course average and your final exam grade (each is a number between 0 and 100).
- Your final grade is determined according to the following table:
Course performance: 88-100 75-87 62-74 50-61 below 50
Final Grade: A B C D F

Students taking MA 554 will find some more advanced problems on their exams so that they can demonstrate understanding on a higher level.

Tips:

- Help is available in the Math Learning Lab (HH 202).
 - By working steadily and regularly, you will increase your chances to succeed in this course.
 - Remember, being a full-time student is a full-time job.
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Disability Support Services

UAB is committed to providing an accessible learning experience for all students. If you are a student with a disability that qualifies under the Americans with Disabilities Act (ADA) and/or Section 504 of the Rehabilitation Act, and you require accommodations, please contact Disability Support Services for information on accommodations, registration and procedures. Requests for reasonable accommodations involve an interactive process and consist of a collaborative effort among the student, DSS, faculty and staff. If you are registered with Disability Support Services, please contact me to discuss accommodations that may be necessary in this course. If you have a disability but have not contacted Disability Support Services, please call 934-4205 or visit <http://www.uab.edu/dss>.