SYLLABUS
INTRODUCTION TO DIFFERENTIAL EQUATIONS-HONORS
MA 252 - 1F, SPRING 2026

DEPARTMENT OF MATHEMATICS
UNIVERSITY OF ALABAMA AT BIRMINGHAM

Course Instructor: Dr. Milena Stanislavova
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Office Hours: Monday 2:30-3:30 pm, UH 4059
    Wednesday 10:30-11:30am, UH 4059

Course Info

Meeting times: MWF 1:25-2:15pm
Meeting location: UH 4004
Prerequisite: Grade of C or better in MA 126, 226 or equivalent.
Credits: 3 semester hours
Textbook: Fundamentals of Diff Equations, R. Nagle, E. Saff, A. Snider, Pearson, 9th ed.
Topics to be covered: Chapters 1, 2, 3, 4, 5, 7 and 9

Important Dates

First day of classes: January 12, 2026
Martin Luther King Day: January 19, 2026
Last Day to drop (without paying full tuition): February 25, 2026
Spring break: March 9-15, 2026
Last Day of class: April 24, 2026
Final Exam: May 1, 2024 10:45am-1:15pm

Course Description

This course is an introduction to ordinary differential equations with extensive applications to mathematical modeling. First order differential equations (separable, linear, exact, and additional non-linear examples), modeling with first order ODE's, examples of systems of first order ODE's, theory of higher order linear DE's (homogeneous and non-homogeneous, superposition of solutions, linear independence and general solutions, initial and boundary value problems), solution of constant coefficient homogeneous linear equations, variation of parameters will be covered in details. Phase plane analysis and applications to epidemic and tumor growth models, as well as the methods of Laplace transform will be added for this honors section. Quantitative Literacy and Writing are significant components of this course.

Learning Outcomes

Upon successful completion of this course students can:

- Develop a mathematical model using differential equations or systems in a variety of problem situations.
- Identify and utilize tools of quantitative reasoning to solve problems that impact academic understanding and public life.
- Critically analyze and evaluate how quantitative information of the mathematical model is derived, reported, and applied.
- Interpret and construct solutions of differential equations in the form of formulas, graphs, tables, and use them to predict the future development/behavior of the system.
- Understand various types of ordinary differential equations and use appropriate methods to solve them analytically or numerically.
- Communicate mathematical results in a manner appropriate to the audience.

Projects, Homework and Quizzes

There will be group projects, which will be assigned as we cover the appropriate material. Every student will select a project and we will form groups of 2 students to work together and to prepare a written project presentation or a poster. These will be presented during the last week of classes.

Homework will be assigned once a week (on Wednesdays), with due date the following Thursday. These will be automatically graded on the MyMathLab platform (with 2 attempts per question), so make sure that you are fairly confident in your answers, before you input them. On Fridays there will be short quizzes, 1-2 problems each. These will be based on the homework. Note that there will be no makeup quizzes, but I will drop the lowest one or two quiz grades.

Exams:

If you have a valid reason for missing the exam, you should contact me BEFORE the exam to discuss alternative arrangements. The final exam will be cumulative, i.e. it will test on all the material. The exams are tentatively scheduled during regular class time on the following dates:

Midterm Exam I	Friday, February 13, in class
Midterm Exam II	Monday, March 23, in class
Midterm Exam III	Wednesday, April 15, in class
Final Exam	Friday, May 1 , 10:45am - 1:15pm

Assessment Procedures

There are 1000 total points possible in the course as follows: Homework - 200 points, Quizzes - 100 points, Projects - 100 points, Midterms - 300 points, Final Exam - 300 points.
Grading scale: 880 points needed for an A, 750 for a B, 620 for a C, 500 for a D, bellow 500 - F.

DSS Accessibility Statement

Accessible Learning: 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) or Section 504 of the Rehabilitation Act, and you require accommodations, 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 DSS, please call (205) 934-4205 or visit the DSS website.

Title IX Statement

The University of Alabama at Birmingham is committed to providing an environment that is free from sexual misconduct, which includes gender-based assault, harassment, exploitation, dating and domestic violence, stalking, as well as discrimination based on sex, sexual orientation, gender identity, and gender expression. If you have experienced any of the aforementioned conduct we encourage you to report the incident. UAB provides several avenues for reporting. For more information about Title IX, policy, reporting, protections, resources and supports, please visit the UAB Title IX webpage for UAB's Title IX Sex Discrimination, Sexual Harassment, and Sexual Violence Policy; UAB's Equal Opportunity and Discriminatory Harassment Policy; and the Duty to Report and Non-Retaliation Policy.