

MA341, Applied Differential Equations

Instructor

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Lectures : Delivered Online, using zoom and Moodle
Office Hours : right after the class, email anytime with questions or to schedule zoom appointment
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Prerequisites: Prerequisite: MA 242 or (MA 132 and MA 231)

Description of the course: Differential equations and systems of differential equations. Methods for solving ordinary differential equations including Laplace transforms, phase plane analysis, and numerical methods. Matrix techniques for systems of linear ordinary differential equations. Credit is not allowed for both MA 301 and MA 341.

Text: Fundamentals of Differential Equations and Boundary Value Problems, by Nagle, Saff, and Snider, 7th Edition, Addison-Wesley.

Tentative plan of lectures: The plan is tentative and will be adjusted based on the actual progress.

Weeks	Chapters	Subjects
1-2	1.1-1.3	Solutions & Initial Value Problems, Direction Fields
	2.2-2.6	First Order Equations, Linear, Separable, Exact Equations
2-3	4.2-4.5	Second Order Linear Equations, Homogeneous & Nonhomogeneous, Undetermined Coefficients, Superposition Principle, Variation of Parameters
		Test 1
3-4	7.2-7.6	Laplace Transform (LT), Inverse LT, using LT to solve initial value problems, Transforms of Discontinuous Functions
4-5	9.1-9.7	Systems of DEs and Linear Algebra, Homogeneous & Nonhomogeneous
		Test 2
5-6	1.4	Euler Method
	5.4	Phase Plane
		Review

Exams: Dates are fixed. Please plan your schedule around these dates now.

Midterm Test I : Friday, June 4 (online)

Midterm Test II : Friday, June 18 (online)

Final Exam : Friday, June 24 (online)

Grading: Your grade will be determined by your scores on the midterm exams (40%), the final exam (30%), and homework assignments (30%).

Letter grades are determined as follows: If X is your percentage grade, then $\{X \geq 98\% \Rightarrow A+; X \geq 92\% \Rightarrow A; X \geq 90\% \Rightarrow A-; X \geq 88\% \Rightarrow B+; X \geq 82\% \Rightarrow B; X \geq 80\% \Rightarrow B-; X \geq 78\% \Rightarrow C+; X \geq 72\% \Rightarrow C; X \geq 70\% \Rightarrow C-; X \geq 68\% \Rightarrow D+; X \geq 62\% \Rightarrow D; X \geq 60\% \Rightarrow D-; X < 60\% \Rightarrow D\}$. I reserve the right to modify these in special cases and to decide if the curve is needed.

Strategies for Success:

- Attend zoom-class meetings regularly.
Read the relevant text book sections and/or additional material when given *before* you attend class. Ask questions and become involved during class sessions.
- Plan to do homework as soon as you learned the relevant material. You are encouraged to use computers to help learn and enhance the course material, as well as to solve and check homework problems. But keep in mind that your goal is to *understand* the material and that you will not have a computer with you during exams.
- Know how grades are computed at the start of the semester and plan your effort accordingly.

Mathematics Tutoring Center: Free tutorial is available in Mathematics Multimedia Center (<https://www.math.ncsu.edu/mmc/>) at 2103 and 2105 SAS Hall. Hours are 8am-5pm Monday-Thursday. A schedule of tutors' hours is available at <https://www.math.ncsu.edu/mmc/tutoring.php>. A list of private tutors is available at <https://www.math.ncsu.edu/mmc/tutorinfo.php>.

Academic Integrity and Honesty: Students are required to comply with the university policy on academic integrity and honesty found in the [Code of Student Conduct](#). Honor Pledge: your signature on any test or assignment indicates "I have neither given nor received unauthorized aid on this test or assignment."

Accommodations for Disabilities: Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, student must register with the [Disability Resource Office](#), also see regulations at <http://policies.ncsu.edu/regulation/reg-02-20-01>.

Non-Discrimination Policy: NC State University provides equality of opportunity in education and employment for all students and employees. Accordingly, NC State affirms its commitment to maintain a work environment for all

employees and an academic environment for all students that is free from all forms of discrimination. Discrimination based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation is a violation of state and federal law and/or NC State University policy and will not be tolerated. Harassment of any person (either in the form of quid pro quo or creation of a hostile environment) based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation also is a violation of state and federal law and/or NC State University policy and will not be tolerated. Retaliation against any person who complains about discrimination is also prohibited. NC State's policies and regulations covering discrimination, harassment, and retaliation may be accessed at <http://policies.ncsu.edu/policy/pol-04-25-05> or http://www.ncsu.edu/equal_op. Any person who feels that he or she has been the subject of prohibited discrimination, harassment, or retaliation should contact the Office for Equal Opportunity (OEO) at 919-515-3148.

Covid Due to the Coronavirus pandemic, public health measures have been implemented across campus. Students should stay current with these practices and expectations through the [Protect the Pack website](#) (<https://www.ncsu.edu/coronavirus>). The sections below provide expectations and conduct related to COVID-19 issues.

Health and Participation in Class We are most concerned about your health and the health of your classmates and instructors/TAs.

- If you test positive for COVID-19, or are told by a healthcare provider that you are presumed positive for the virus, please work with your instructor on health accommodations and follow other university guidelines, including self reporting ([Coronavirus Self Reporting](#)): Self-reporting is not only to help provide support to you, but also to assist in contact tracing for containing the spread of the virus.
- If you feel unwell, even if you have not been knowingly exposed to COVID-19, please do not come to class.

- If you are in quarantine, have been notified that you may have been exposed to COVID-19, or have a personal or family situation related to COVID-19 that prevents you from attending this course in person (or synchronously), please connect with your instructor to discuss the situation and make alternative plans, as necessary.
- If you need to make a request for an academic consideration related to COVID-19, such as a discussion about possible options for remote learning, please talk with your instructor for the appropriate process to make a COVID-19 request (a university-level form can be found [here](#)).

Health and Well-Being Resources These are difficult times, and academic and personal stress are natural results. Everyone is encouraged to [take care of themselves](#) and their peers. If you need additional support, there are many resources on campus to help you:

- Counseling Center ([NCSU Counseling Center](#))
- Health Center ([Health Services — Student](#))
- If the personal behavior of a classmate concerns or worries you, either for the classmate's well-being or yours, we encourage you to report this behavior to the NC State CARES team: ([Share a Concern](#)).
- If you or someone you know are experiencing food, housing or financial insecurity, please see the Pack Essentials Program ([Pack Essentials](#)).

Community Standards related to COVID-19 We are all responsible for protecting ourselves and our community. Please see the [community standards](#) (released on 7/28/2020) and Rule 04.21.01 regarding Personal Safety Requirements Related to COVID-19 [RUL 04.21.01 – Personal Safety Requirements Related to COVID-19 – Policies, Regulations & Rules](#).

Course Expectations Related to COVID-19:

- **Face Coverings:** All members of the NC State academic community are required to follow all university guidelines for personal safety with face coverings, physical distancing, and sanitation. Face coverings are required in class

and in all NC State buildings. Face coverings should be worn to cover the nose and mouth and be close fitting to the face with minimal gaps on the sides. In addition, students are responsible for keeping their course/work area clean. Please follow the cleaning guidelines described by the university.

- **Course Attendance:** NC State attendance policies can be found at: [REG 02.20.03 – Attendance Regulations – Policies, Regulations & Rules](#). Please refer to the course's attendance, absence, and deadline policies for additional details. If you are quarantined or otherwise need to miss class because you have been advised that you may have been exposed to COVID-19, you should not be penalized regarding attendance or class participation. However, you will be expected to develop a plan to keep up with your coursework during any such absences. If you become ill with COVID-19, you should follow the steps outlined in the health and participation section above. COVID 19-related absences will be considered excused; documentation need only involve communication with your instructor.
- **Course Meeting Schedule:** Your course might not have a traditional meeting schedule in Fall 2020. Be sure to pay attention to any updates to the course schedule as the information in this syllabus may have changed. Please discuss any questions you have with the instructor.
- **Classroom Seating:** To support efficient, effective contact tracing, please sit in the same seat when possible and take note of who is sitting around you; instructors may also assign seats for this purpose.
- **Technology Requirements:** This course may require particular technologies to complete coursework. Be sure to review the syllabus for these expectations, and see the [syllabus technology requirements](#) for your course. If you need access to additional technological support, please contact the Libraries' Technology Lending Service: ([Technology Lending](#)).

Course Delivery Changes Related to COVID-19 Please be aware that the situation regarding COVID-19 is frequently changing, and

the delivery mode of this course may need to change accordingly, including from in-person to online. Regardless of the delivery method, we will strive to provide a high-quality learning experience.

Grading/Scheduling Changing Options Related to COVID-19 If the delivery mode has a negative impact on your academic performance in this course, the university has provided tools to potentially reduce the impact:

- **Enhanced S/U Grading Option:** [Enhanced Satisfactory/ Unsatisfactory Grading Option](#)
- **Late Drop:** [Enhanced Late Drop Option](#)

In some cases, another option may be to request an incomplete in the course. Before using any of these tools, discuss the options with your instructor and your academic advisor. Be aware that if you use the enhanced S/U, you will still need to

complete the course and receive at least a C- to pass the course.

Other Important Resources

- Keep Learning: [Keep Learning](#)
- Protect the Pack FAQs: [Frequently Asked Questions — Protect the Pack](#)
- NC State Protect the Pack Resources for Students: [Resources for Students — Protect the Pack](#)
- NC State Keep Learning, tips for students opting to take courses remotely: [Keep Learning Tips for Remote Learning](#)
- [Introduction to Zoom](#) for students.
- Learning with Moodle, [a student's guide to using Moodle](#)
- NC State Libraries [Technology Lending Program](#)