MA 341-651: Applied Differential Equations I
Summer 2021

Instructor: Elisabeth Congdon (ercongdo@ncsu.edu)
Office Hours: By appointment – please use this link to schedule
Personal Zoom Meeting ID: 321-705-9040
Lecture Videos:
Moodle and WeBWorK (must log into Moodle to access): Wolfware,

Course Description:
Prerequisite: MA 242 or (MA 132 and MA 231) 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.

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

Grading:
This course uses standard NCSU letter grading.

A+	97-100%	C	73-76%
A	93-96%	C-	70-72%
A-	90-92%	D+	67-69%
B+	87-89%	D	63-66%
B	83-86%	D-	60-62%
B-	80-82%	F	Below 60%
C+	77-79%		

Grade Component	Homework	Unit Exams (2)	Final Exam
Weight	20%	45%	35%

Schedule:

The following is the recommended pacing guide for this course

Week	Sections	Topics	Videos
May 19-21	1.1-1.2 1.3 1.3	Solutions and Initial Value Problems Direction Fields Phase Line Supplement	1 2 2
May 24-28	2.2 2.3 3.2	Separable Equations Linear First Order Equations Applications	3 3 4
June 1-4	3.3 2.4 4.1-4.2 4.2-4.3	Newton's Law of Cooling Exact Equations Introduction to Second Order Linear Equations Homogeneous, Linear Eqns.- Constant Coefficients	5 5 5 6
June 7-11	4.4 4.5	Undetermined Coefficients Superposition Principle Exam 1: June 11	7 8
June 14-17	4.6 4.9-4.10 7.2 7.2-7.3	Variation of Parameters Free and Forced Mechanical Vibrations Definition of the Laplace Transform Laplace Transform Properties	9 10 10 11
June 21-25	7.4 7.5 7.6	Inverse Laplace Transform Solving IVPs with the Laplace Transform Transforms of Discontinuous Functions	12 13 14
June 28-July 2	9.1-9.3 9.4	Systems of Differential Eqns. and Linear Algebra Linear Systems in Normal Form	15 16
July 6-9	9.5 9.6	Linear Systems with Constant Coefficients – Real Eigenvalues Linear Systems with Constant Coefficients – Complex Eigenvalues Exam 2: July 9	17 18
July 12-16	9.7 9.7	Nonhomogeneous Linear Systems Applications: Interconnected Tanks	19 19
July 19-23	5.6 5.4	Coupled Mass-Spring Systems Phase Plane Analysis	20 21
July 26-30	12.2 12.3	Linear Systems in the Plane Almost Linear Systems Additional Review	21 22 23
August 2 or 3		Final Exam	

Lectures:

We will be using pre-recorded online lectures for this course. You will find the link on the Moodle page for this course and at the top of this syllabus. You will need to log in with your UnityID and password to access the videos.

Homework:

Homework assignments will be completed online using the WeBWorK system, which is currently free for students. You are responsible for checking WeBWorK to make timely progress through the assignments. In this class, assignments appear long before they are due. I recommend giving yourself around 3 days to complete each homework assignment so that you have time to try each problem, get any needed help, and complete the assignment in time. If you ask for help on the due date of an assignment, I may not be able to respond before the assignment is due.

All homework extension requests must be submitted through the "Email the instructor" feature on WeBWorK. Each student will get one 24-hour homework extension on one assignment during the course – no questions asked. After this one-time extension, there will be a 25% penalty on the assignment for each day an assignment is not completed.

Problem Sessions:

Each week on Mondays at 1:00 pm eastern, there will be a one-hour problem solving session on Zoom. Attendance is not mandatory but strongly recommended. These sessions will be recorded and posted on the Moodle site promptly after the session. Use my personal Zoom Meeting ID at the top of this syllabus to join the Zoom meeting.

Tests:

There are two scheduled unit exams during the semester (See schedule above). All exams will be administered over Zoom. You will have the option of choosing to take the test either from 8-9:15 am or 7-8:15 pm eastern on test day (See schedule above). We will be using the site Gradescope to upload exams for grading in this class. The link to Gradescope is given in the Moodle site.

Should you need to miss an in-class test due to an excused absence, a makeup test will be given by appointment either before or after the scheduled test. These are closed-book exams without any form of aid allowed (e.g. no calculator, no phone, no computer, no book/notebook etc.). There will be no test questions for which a calculator is needed.

The final exam is mandatory and cumulative. The exam will be 2.5 hours long and you will have a choice of taking it on one of two days (See schedule above) from 6-8:30 pm eastern. The only way to take the final exam on a different day is to request a change through the department of Registration and Records, 1000 Harris Hall.

Make-Up Test Policy:

All excused anticipated absences must be excused in advance of the test date. The student must provide proper documentation and schedule a make-up test in advance of the absence.

Excused emergency absences must provide documentation verified by proper authorities to schedule a make-up exam.

Academic Integrity:

Students are required to comply with the university policy on academic integrity found in the Code of Student Conduct. The NCSU Student Code of Conduct covers all work done in this course. Any suspected violations will be promptly reported. Academic dishonesty will result in an automatic failing grade for the course.

Accommodations for Disabilities:

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, the student must register with the Disability Resources Office , 919-515-7653. For more information on NC State's policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation.

Basic Needs Security:

Any student who faces challenges securing their food or housing or has other severe adverse experiences and believes this may affect their performance in the course is encouraged to notify the professor if you are comfortable in doing so. Alternatively, you can contact the Division of Academic and Student Affairs to learn more about the Pack Essentials program

Supporting Fellow Students:

As members of the NC State Wolfpack community, we each share a personal responsibility to express concern for one another and to ensure that this classroom (as well as the campus as a whole) remains a healthy and safe environment for learning. Occasionally, you may come across a classmate whose personal behavior concerns or worries you, either for your classmate's well-being, for your well-being or for the well-being of others. When this is the case, I would encourage you to report the behavior on the link located on NC State's Students of Concern website.

List of Policies:

Students are responsible for reviewing the NC State University PRRs (policies, rules and regulations) that pertain to their course rights and responsibilities:

- Equal Opportunity and Non-Discrimination Policy with additional references
- Code of Student Conduct
- Grades and Grade Point Average
- Credit-Only Courses
- Audits