MA 341-651: Applied Differential Equations
Summer 2020

Instructor: Ella Pavlechko
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Personal Zoom Meeting ID: 278-582-1980
Office Hours: MW 11:00AM - 12:00PM and by Appointment

Lectures: https://mediasite.wolfware.ncsu.edu/online/Channel/ma-341-summer-2017-kurtz
Moodle page/Course Webpage: https://wolfware.ncsu.edu/
WeBWorK: (must login on Moodle to access)
https://webwork.math.ncsu.edu/webwork2/MA341_Pavlechko/

Catalog Description:
Prerequisite of 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.

Grade Calculation:

Homework	15 %
3 Term Tests	55 %
Final Exam	30 %

If you complete all homework and all Tests, your lowest Test grade will be replaced with your Final Exam grade (if your Final Exam grade is higher).

Grading Scale: The final grade will be assigned using the plus/minus grading system

A+: 98-100	**A:** 93-97.99	**A-:** 90-92.99
B+: 88-89.99	**B:** 83-87.99	**B-:** 80-82.99
C+: 78-79.99	**C:** 73-77.99	**C-:** 70-72.99
D+: 68-69.99	**D:** 63-67.99	**D-:** 60-62.99

This policy is *strict* - I will not be rounding grades for individual students.

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

There are many good editions of this textbook that can be used (some of which are free through the library). They have different covers and page numbers, but most of the problems will be the same.

Lectures: We will be using pre-recorded online lectures that can be found here. You will need to login with your UnityID and password to access them. I have provided a recommended pacing guide (below) for you to schedule watching the lectures.

Problem Sessions: Each week, on a day to be determined by the class, there will be a 1 hour problem-solving-session held over Zoom. If you are unable to attend the problem session, they will be recorded and posted to the Moodle page. Attendance is not mandatory, but strongly recommended since it gives you the opportunity to ask questions. Once the meeting day is determined, I will send out more information on how to login.

Homework: Homework assignments will be completed online using WeBWorK, which is currently free to students. You are responsible for checking WebWork to make timely progress through the assignments. Assignments will be due at least once a week, but I recommend working on the problems a little bit every day. To access WebWork you must login to Moodle, and then press the WebWork link listed at the top of the page, which will take you to https://webwork.math.ncsu.edu/webwork2/MA341_Pavlechko/

If you are unable to get into WeBWorK for any reason, email me. You can find more information about submitting your assignments in WeBWorK on the course webpage.

Homework Extensions: All homework extension requests must be submitted through Email to the Instructor. Each student will get a 24 hour homework extension on one assignment during the course with no penalties. To use the extension, send me an email before the assignment's deadline saying you'd like to use your "Freebie Extension". After the one-time extension there will be a 25% penalty on the total grade for each day an assignment is not completed.

Term Tests: There are 3 scheduled tests during the semester (see schedule for dates). Until the DELTA proctoring services are open, Tests will be held online using Moodle. There will be a 24 hour window to begin the Test, but once it has begun students will have 1.5-2 hours to complete the Exam. There will be a Homework Assignment on the Moodle page to get you familiar with the format to view/submit the Tests online. If proctoring services become available during the course, we will switch to that. Scientific/basic/financial calculators are okay, but graphing calculators are not allowed.

Final Exam: The Final Exam is mandatory and cumulative. The Exam will be 3 hours long and you can take it either July 27 or 28. The only way to take the final exam at another time 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 a make-up test scheduled in advance of the absence. Excused emergency absences must provide documentation verified by the proper authorities in order to schedule a make-up Exam.

Excused anticipated absences include: University duties or trips (certified by an appropriate faculty or staff member), required court attendance (certified by the Clerk of Court), religious observances (certified by the Department of Student Development: 515-2441).

Excused emergency absences include: illness (certified by an attending physician), or family emergencies (certified by the Department of Student Development: 515-2441).

Corrections to grading: If you feel that an error was made in the grading of a test, present and explain the error in an email to the Instructor within 1 week after the test is returned. Grade changes will not occur outside of this timeframe.

Academic Integrity: I assume that anything turned in with your name on it is your own work. Each time you submit a test, Homework, or quiz, you affirm the honor pledge. "I have neither received nor given unauthorized aid on this assignment." The minimum penalty for cheating is a grade of zero on the assignment; violators will be reported to the Academic Integrity Review Board, which can impose additional sanctions. The code of student conduct can be found at http://studentconduct.dasa.ncsu.edu/code/

Disability Services: Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with the Disability Resource Office: https://dro.dasa.ncsu.edu/enrolled-students/

Non-discrimination Policy: NC State prohibits discrimination, harassment, and retaliation that are based upon a person's race, color, religion, sex, national origin, age, disability, gender identity, sexual orientation, or veteran status. If you feel that you have been the subject of prohibited discrimination, harassment, or retaliation, you should contact the Office for Institutional Equity and Diversity (OIED) at 919-515-3148.

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://oied.ncsu.edu/divweb

Schedule: The following is the recommended pacing guide for the course

Week	Sections	Topics
May 13-15	1.1-1.2 1.3 1.3	Solutions & Initial Value Problems (Video 1) Direction Fields (Video 2) Phase Line Supplement (Video 2)
May 18-22	2.2 2.3 3.2	Separable Equations (Video 3) Linear First Order Equations (Video 3) Applications (Video 4)
May 26-29	3.3 2.4 4.1-4.2 4.2-4.3	Newton's Law of Cooling (Video 5) Exact Equations (Video 5) Introduction, Second Order Linear Equations (Video 5) Homogeneous Linear Eqns. w/ Constant Coefficients: Real and Complex Roots (Video 6)
June 1-5	4.4 4.5	Undetermined Coefficients (Video 7) Superposition Principle (Video 8) **Test 1: June 5**
June 8-12	4.6 4.9-4.10 7.2 7.2-7.3	Variation of Parameters (Video 9) Free and Forced Mechanical Vibrations (Video 10) Definition of the Laplace transform (Video 10) Laplace transform: definition and properties (Video 11)
June 15-19	7.4 7.5 7.6	Inverse Laplace Transform (Video 12) Solving IVP's with Laplace Transforms (Video 13) Transforms of Discontinuous Functions (Video 14)
June 22-26	9.1-9.3 9.4	Systems of Differential Equations and Linear Algebra (Video 15) Linear Systems in Normal Form (Video 16) **Test 2: June 26**
June 29 -July3	9.5 9.6	Linear Systems of Diff. Eq. with constant Coefficients: Real Eigenvalues (Video 17) Linear Systems of Diff. Eq. with constant Coefficients: Complex Eigenvalues (Video 18)
July 6-10	9.7 9.7	Nonhomogeneous Linear Systems (Video 19) Applications: Interconnected Tanks (Video 19)
July 13-17	5.6 5.4	Coupled Mass-Spring Systems (Video 20) Phase Plane (Video 21) **Test 3: July 17**
July 20-24	12.2 12.3	Linear Systems in the plane (Video 21) Almost Linear Systems (Video 22) Additional Review Video (Video 23)
July 27 or 28		**Final Exam**