

## MA 401 Applied Differential Equations II

### Lecture details

Section 001 SAS 2235, 9:35-10:25am  
Instructor: Leslie Kurtz  
Office: SAS 3240  
Email: lakurtz@ncsu.edu  
Phone: 919.513.2111  
Office Hours: MWF 1:30-2:30pm over Zoom or by appointment  
or by appointment  
Moodle page: <https://wolfware.ncsu.edu>  
WeBWorK: <https://wolfware.ncsu.edu>

### Course text:

*Applied Partial Differential Equations*, by J. David Logan, 3rd Edition, Springer.  
[catalog.lib.ncsu.edu/record/NCSU3339742](http://catalog.lib.ncsu.edu/record/NCSU3339742)

**Catalog Description** Wave, heat and Laplace equations. Solutions by separation of variables and expansion in Fourier Series or other appropriate orthogonal sets. Sturm-Liouville problems. Introduction to methods for solving some classical partial differential equations. Use of power series as a tool in solving ordinary differential equations. Credit for both MA 401 and MA 501 will not be given. Prerequisite: MA 341

### Grading Policy

The grading will be assigned on a 10-point scale: **A: 90 – 100, B: 80 – 89, C: 70 – 79, D: 60 – 69, F:  $\leq 60$**

The cutoffs for the +/- grades are determined at the end of the semester. Your final grade in this course will be determined by marks earned on the final exam, three term tests, and online homework assignments. The weighting of these components are as follows:

Homework = 15 %  
Three term tests = 50 %  
Final Exam = 35 %

### Term Tests 50%

There will be three closed book, closed notes tests. Calculators of any kind are not permitted on tests or the final exam. If you are ill on a test day, you will need to present a doctor's note to reschedule.

**Test 1:** September 30

**Test 2:** October 28

**Test 3:** November 21

Students will record their attendance by entering an attendance password every class before 11pm. If you have no more than 3 absences and have taken all the tests, your lowest test grade will be replaced by your final exam grade assuming it is higher.

### Final Exam 35%

The final exam is mandatory and cumulative. Your final exam is on Dec 12 from 8:30-11am. 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.

**Homework Assignments** will be completed online using an Internet-based homework service called WeBWorK. You can find your assignments located near the bottom of our Moodle page. I will send out reminders when you have upcoming assignments. We also may have some written assignments to supplement the WeBWork assignments.

### Corrections to the grading

The responsibility for grading tests resides with the grader for this section. After the tests are returned, you have 3 days to look them over and compare them to the solutions online. If you believe an error has been made in grading on a test, you need to notify me within those 3 days. Grade changes will not occur outside of this timeframe. Do not alter the original work!

**Students with disabilities**

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with Disability Services: <https://dro.dasa.ncsu.edu>  
Please let me know how I can better accommodate you.

**Academic Integrity Statement and Academic Dishonesty**

I assume that anything turned in with your name on it is your own work. Each time you submit a test, homework, quiz, or WebWork assignment, you affirm the honor pledge, "I have neither received unauthorized aid nor given 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 Board, which can impose additional sanctions. The code of student conduct can be found at: <https://policies.ncsu.edu/policy/pol-11-35-01>

**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>.

**COVID ADDENDUM:**

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. 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.

**MA 401 Tentative Topics List**

Sections	Topics
1.1	PDE Models
1.2	Conservation Laws
1.3	Diffusion
1.5	Vibrations and Acoustics
1.7	Heat Diffusion in Higher Dimensions
1.8	Laplace's Equation
1.9	Classification of PDEs
2.1	Cauchy Problem for the Heat Equation
2.2	Cauchy Problem for the Wave Equation
2.7	Fourier Transforms
2.5	Sources
2.6	Laplace Transforms
	Series Solutions
3.1	Fourier Method
3.2	Orthogonal Expansions
3.3	Classical Fourier Series
4.2	Sturm-Liouville Problems
4.1	Overview of Separation of Variables
4.4	Laplace's Equation
4.7	Sources on Bounded Domains
4.6	Diffusion on a Disk

**Good Luck!**