

MA 401 (Section 001)

Applied Differential Equations II

Summer Session 1 2022

R&R 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; Credit not allowed for both MA 401 and MA 501

Instructor: Dr. Mansoor Haider, mahaid@ncsu.edu, 919-515-3100

Time/Place: 9:50-11:20am, M/T/W/Th/F, 215 Park Shops

Moodle page: <https://moodle-courses2122.wolfware.ncsu.edu/course/view.php?id=9926>

Lecture Notes: Templates for the class lecture notes will be uploaded a few days in advance of each lecture on the course Moodle page. Please download, in advance of attending the lecture, the pdf file for the lecture notes for each class day as indicated on the schedule in Moodle.

Lecture Recordings: All lectures will be recorded via Panopto and there will be a (non-interactive) live stream on a short time delay. Students are responsible for all lecture content missed by not attending class in person or staying on top of the lecture videos.

Attendance Bonus: **A bonus of 5 percentage points**, applied to your lowest test grade, will be given to students that attend **at least 12 (non-test) lectures in person**. Documented absences (e.g. for medical reasons or family emergencies) will be taken into consideration.

Office Hours: Mondays & Wednesdays (except 5/18): 12:30-1:30pm
Tuesdays: 4:30-5:30pm
Thursday & Fridays: by appointment
All office hours are in person & on zoom, via link on Moodle page

Prerequisites: MA 341 or an equivalent course in undergraduate differential equations

Textbook: *Introduction to Applied Partial Differential Equations* **[optional]**, 1st Ed., by John M. Davis, WH Freeman & Co., New York, 2013, ISBN-13: 978-1-4292-7592-7. For each section of the lecture notes, the most closely related section of the textbook will be indicated for students that would like to also use a textbook for this class.

Grade: **Homework (25%) + 2 Tests (40%) + Final Exam (35%)**
Final grades will be assigned using the following grading system:
A+: [98,100] A: [92,98) A-: [90,92)
B+: [88,90) B: [82,88) B-: [80,82)
C+: [78,80) C: [72,78) C-: [70,72)
D+: [68,70) D: [62,68) D-: [60,62)
F: [0,60)

Homework: Homework problems will be assigned for each section of material covered in class and due via Moodle roughly every 3-4 days as indicated on the course Moodle page. All homework assignments should be submitted electronically via Moodle with a single pdf file being the preferred format.

Tests: **Two tests** will be given on **Wednesday June 1st** and **Tuesday June 14th**. You can choose to take each test **either** in person **or** live via Zoom with your mic and camera on. Detailed instructions will be provided closer to each test date.

Final Exam: The **Final Exam** will take place on **Thursday June 23rd** from **8:30am to 11:00am**. You can choose to take the final exam **either** in person **or** live via Zoom with your mic and camera on. Detailed instructions will be provided closer to the final exam date.

Topics:

Unit I Review of Elementary Ordinary Differential Equations
Unit II Fourier Analysis
Unit III Series Solutions of Ordinary Differential Equations
Unit IV Special Functions
Unit V Partial Differential Equations in Rectangular Coordinates
Unit VI Partial Differential Equations in Other Coordinate Systems
Unit VII Additional PDE Topics (1st order equations etc) [
Review for Tests & Final Exams

ClassEval: Evaluations will be available 6/6/22 (8am) through 6/23/22 (8am)

Academic Integrity and Disabilities Information: Please review the following NCSU policies:

<https://policies.ncsu.edu/policy/pol-11-35-01>

<https://policies.ncsu.edu/regulation/reg-02-20-01>

Covid-19 Information, Policies and Resources:

Students are referred to the [Protect the Pack](https://www.ncsu.edu/coronavirus/) website (<https://www.ncsu.edu/coronavirus/>) to keep up with the current . expectations and conduct related to COVID-19 issues.