Math 4581 Summer 2026 Syllabus

[Classical Mathematical Methods in Engineering, 3 Credit hours, (BG) CRN56140 and (BU) CRN56141 and (Q) CRN50446]

Lectures: Mon, Wed, Fri, in person in Allen Sustainability Building, room 110. Lectures run from 14:00-15:15. Lectures will be recorded, and recordings placed in Media Gallery. Students may also watch lectures remotely through Zoom. A link will be sent before classes.

Instructor Information

Doron Lubinsky, lubinsky@math.gatech.edu,
Office hours: Monday, Wednesday 12:30-13:30 via Zoom or in person in Skiles 237A

Course Description

Description
The course provides an introduction to classical analytical methods for solving partial differential equations. The main tools will be separation of variables, Fourier series and the Laplace transform. The topics to be covered are:

(1) Fourier series and Fourier integrals
(2) The Sturm-Liouville Theorem
(3) The heat equation
(4) The wave equation
(5) Laplace and Poisson equations
(6) Laplace transform
(7) Heat flow and wave equation using the Laplace transform.

Course Objectives and Learning Outcomes

- Computing Fourier series and study their convergence.
- Using separation of variables on the heat and wave equations.
- Using polar and cylindrical coordinates for the Laplace and Poisson equations
- Applying the method of eigenfunction expansions
- Computing Laplace transforms and applying them to ordinary and partial differential equations
- Applying the Laplace transform to heat flow and wave equation problems

Course Materials

Course Textbook
Boundary Value Problems, 6th edn., by David Powers, Academic Press, Elsevier, 2010.

Additional Materials/Resources

The homeworks, test information sheets, solutions to tests, and videos of classes will all be posted in folders in "Files" in Canvas or in Media Gallery. Grades will be posted in Canvas. There will be a weekly announcement posted in Canvas.

Grading Policy and Weighting

There will be regular Homework, 2 midterm tests, and a final exam

The items are weighted as follows:
Homework: 35%
Midterm tests: 40% (Each midterm counts 20%)
Final exam: 25% (Every student must write the final exam)
No extra credit.

Makeup Tests
These will only be given where there is a letter from the Dean of Students, or approved university absence.

Grading Scale

You can be guaranteed at least the following grades if your percentage lies in the specified range:

A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	0-59%

There will also be a curve that might allow e.g. an A for a grade slightly lower than 90%. This is decided at the end of the course based on the distribution of final percentages in the class.

Attendance Policy

Students are encouraged to attend lectures in person or remotely, but this is not required.

Additional Criteria for Successful Completion of the Course

Collaboration & Group Work

Students may discuss homework problems with each other, but should complete their own solutions. There must not be any communications between fellow students during tests.

Extensions, Late Assignments, & Re-Scheduled/Missed Exams

Makeup Tests will only be given where there is a letter from the Dean of Students, or approved university absence.
There is no allowance for late homework submission. In cases of medical emergency, missed homework assignments will not be counted.

Academic Honesty/ Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Georgia Tech's Academic Honor Code, please visit http://www.catalog.gatech.edu/policies/honor-code/ or http://www.catalog.gatech.edu/rules/18/.

Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Statement about acceptable student/ faculty conduct

Students are expected to take their responsibilities seriously, attend class either remotely or later watch the recorded lectures, behave respectfully to fellow students, to the grader, and the instructor. They should complete all homeworks in a timely manner, and ask for help where appropriate.

The instructor is expected to provide clear lectures and instructions for the components of the course, to treat students courteously, to ensure fair and timeous grading, to allow regrades, and to coordinate the course conscientiously.

Mobile Devices may not be used in the Classroom

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or http://disabilityservices.gatech.edu/, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs