

CEE 6461, Fall 2021
Math Applications in CEE
TR 6:30-7:45pm, Mason 3132

Instructor: Prof. Arash Yavari
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Office Hours: Tuesdays and Thursdays 5:00-6:00 pm
TA: TBA
Office Hours: TBA

Course Overview: This is an engineering mathematics course for graduate students interested in developing their mathematical skills for solving a wide range of civil and environmental engineering problems. Each topic will be introduced/motivated by some real engineering/physical problems. Presentation of the basic topics will be rigorous but applications to problems in engineering and science will be stressed.

Textbook: *Advanced Engineering Mathematics*, 10th Edition by Erwin Kreyszig

Course Outline

- **Ordinary Differential Equations** (Chapters 1-4)
 - First-Order ODEs
 - Second-Order Linear ODEs
 - Higher Order Linear ODEs
 - System of ODEs
- **Linear Algebra** (Chapters 7 and 8)
 - Matrices, Vectors, Determinants, Linear Systems
 - Matrix Eigenvalue Problems
- **Vector Calculus** (Chapters 9 and 10)
 - Vector Differential Calculus, Grad, Div, Curl
 - Vector Integral Calculus, Integral Transforms
- **Fourier Analysis** (Chapter 11)
 - Fourier Series
 - Orthogonal Series, Generalized Fourier Transforms
 - Fourier Transform
- **Partial Differential Equations** (Chapter 12)
 - Basic Concepts of PDEs
 - Method of Separation of Variables
 - Examples of Important PDEs: Wave and Heat Equations

Prerequisites: None

Grading: Weekly Homeworks: 30%, Midterm Exam: 30%, Final Exam: 40%

Dates for Tests:

Midterm Exam: Tuesday, October 26

Final Exam: Tuesday, December 14, 6:00 PM - 8:50 PM

ATTENDANCE MISC: Attendance at all lectures is required. Excused absences must be cleared with me in advance, by e-mail, phone, or in person. Please turn your cell phone off when you are in class! NO LAPTOP COMPUTERS and NO TEXT MESSAGING in CLASS.

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.

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.