

ECE3025 Syllabus

Electromagnetics, Autumn 2026

MWF, 12:30-13:45 pm, Scheller College of Business, Room 202

Class page: <https://canvas.gatech.edu>

Delivery Mode: In person

Instructor Information

Instructor Prof. Nima Ghalichechian	Email nima.1@gatech.edu	Office Hours & Location 2-3 pm, Mondays (or by appointment), TSRB # 534
Teaching Assistant(s) TBD	Email TBD	Office Hours & Location TBD

General Information

Description

ECE 3025 is a core course on electromagnetic fields and waves. Major topics include signals on transmission lines, Maxwell's questions, electrostatic and magnetostatic fields, and uniform electromagnetic plane waves. These topics constitute the fundamental foundations for understanding the behavior of analog and digital electrical signals in electronics or communications at all frequency ranges.

Pre- &/or Co-Requisites

ECE 2040 (Circuit Analysis) and one of the following math courses: MATH 2403 or MATH 2413.

Course Goals and Learning Outcomes

- Become familiar with the theory and application of waves and pulses on transmission lines
- Learn basic transmission line impedance matching concepts
- Become familiar with the concepts of capacitance and inductance from a physical standpoint
- Become familiar with the basic laws of electrostatics as well as time varying electromagnetic fields
- Become familiar with the concepts of wave propagation, polarization, attenuation, reflection, and transmission

Course Schedule (tentative)

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- Introduction: Waves, Complex Numbers & Phasors (Weeks 1-2)
 - Transmission Lines (Weeks 2-5)
 - Smith Chart & Impedance Matching (Week 6)
 - Vector Analysis (Week 7)
 - Electrostatics and Magnetostatics (Weeks 8-10)
 - Time-Varying Fields (Week 11-12)
 - Plane Wave Propagation (Week 13-14)

Course Requirements & Grading

Assignment	Date/Frequency	Weight	Notes
HomeWorks	~Weekly	0%	
Homework quizzes	~Biweekly	20%	
Midterm 1	TBD	20%	
Midterm 2	TBD	20%	
Computer Assignments	~3 per semester	15%	
Final exam	TBD	25%	

Homework Assignments

Homework assignments are important part of the learning process. Approximately 10 homework assignments will be posted throughout the semester. The solution to these problems will also be posted at the same time. Homeworks will not be due and will not count towards the final grade. You don't turn in these assignments as they are not graded. You are expected to work on them on a weekly basis and check your work with the solution that I provide.

Homework Quizzes

After 2-3 homework assignments, a 15-minutes closed-book/closed-notes quiz will be given during the lecture. The quiz will be similar to your homework problems and will cover the corresponding lectures. The set of homework assignments and lectures that each quiz will cover will be announced a week in advance. The first quiz should be expected at the beginning of Week 3. At the end of the semester, the lowest grade (quiz) will be dropped. No make-up quiz is given.

Extra Credit Opportunities

Several extra credits problems, each having 1 point, will be assigned throughout the semester. These are optional and will be directly added to your total grade. Homework-like assignments are expected to be slightly more challenging than regular homework problems. Occasionally, a simulation or MATLAB program will be assigned as an extra credit. You can expect 3-4 extra credits throughout the semester.

Midterm #1 and #2

Two midterm exams will take place during the semester. The exam will be closed-book/closed-notes. You will be allowed a single cheat sheet, 8.5" by 11", with handwritten notes only, on both sides. Do not print or type your cheat sheet. Only hand-written notes are allowed! No internet-enabled devices are permitted. You may bring a simple calculator to the exam.

Computer Assignments

A few computer assignments will be given throughout the semester. These are designed to complement the class material. These are submitted as an individual project. However, you may work with your classmates if you prefer. You need to list the name of your partner (if any) on your assignment.

Final Exam

The final exam is cumulative and covers the entire course material. The exam will be closed-book/closed-notes. You will be allowed two (2) cheat sheets, each 8.5" by 11", with handwritten notes only, on both sides. Do not print or type your cheat sheet. Only hand-written notes are allowed! No internet-enabled devices are permitted. You may bring a simple calculator to the exam.

Grading Scale

Your final grade will be assigned as a letter grade according to the following Georgia Tech scale.

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

Course Materials

Lecture and other Supplementary Material

Supplementary lecture notes (a copy of the slides) are available on Canvas. The solution to homework assignments, quizzes, exams are posted as well. Other supplementary notes, codes, and papers are available on Canvas.

Recommended Course Text - you are not forced to buy this!

Book: Fundamentals of Applied Electromagnetics”, PEARSON, 8th Edition, by F. Ulaby and U. Ravaioli; You may purchase older editions i.e. Edition 7 or any other older editions.

Companion webpage: <https://em8e.eecs.umich.edu/>. Under Modules navigate and experience with different applets.

Course Website and Other Classroom Management Tools

<https://canvas.gatech.edu>

Contacting me

Please contact me if you can't attend the office hour but you want to meet me. Also contact me for any other issue. I typically respond within 24 hours (nima.1@osu.edu). My office is in TSRB room # 534. We can also schedule a virtual meeting if you prefer.

Attendance and/or Participation

Class attendance is highly recommended. During the class, it is recommended that you take notes. While supplementary lecture notes will be posted on CANVAS, the notes are not to be considered as a direct replacement for you own class notes and participation. Discussions during lectures are important part of the learning for this course. If you miss a lecture, review the posted lecture notes on CANVAS. Complete the reading assignments and attend the office hours.

Collaboration & Group Work

Students are encouraged to work together on homework assignments and simulation projects. However, you must submit your own version of the assignment. Needless to say, that you are expected to complete the quizzes, midterms, and final exams yourself, without any external help or communication.

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

The dates of the 2 midterms and the final exams are announced in this document. Please note these dates and make the necessary arrangements to attend. If you can't attend any exam, notify me as soon as possible. No makeup exam (midterms and final) will be given unless there is a documented emergency. Any missed quiz or exam will result in a zero grade. Quizzes are announced a week in advance and are held in the class. Notify me regarding your emergency if you can't attend a quiz. I will exclude that quiz, but no makeup quiz is given. Homework assignments are not graded and are not due. No late submission is accepted for assignments. Late submission will result in a zero grade.

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. Violating Georgia Tech's Academic Honor Code may result in the grade of zero for the assignment.

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.

Student-Faculty Expectations Agreement

At Georgia Tech we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See <http://www.catalog.gatech.edu/rules/22/> for an articulation of some basic expectation that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.