ECE 6350 Syllabus

Applied Electromagnetics, Section A/Q, 3 hours credit

Fall 2026

Instructor Information

Instructor: Andrew F. Peterson

Email: afpeterson@gatech.edu

Registered students may find additional instructor contact information and the current schedule of instructor in-person and Zoom office hours on the GT Canvas site.

General Course Information

Description

ECE 6350 is an introductory graduate-level course on electromagnetic (EM) fields, with emphasis on the most common types of waves possible in different materials, techniques for determining EM fields created by sources in simple environments, and exact and approximate approaches for solving EM problems.

Pre- &/or Co-Requisites

Graduate Standing.

Mode of Instruction

ECE 6350 is taught in multiple formats, with in-person classes meeting regularly in the assigned classroom. The remote section is asynchronous, with videos, course notes, and other materials available through the GT Canvas system. Office hours will be held in person and via Zoom, at different time slots. Video recordings cover all lecture content and serve as the primary mode of instruction for remote students and as a supplement for in-person students. In the event of a campus emergency or instructor absence, these videos will replace in-person classes on the same schedule. Weekly homework assignments will be collected through Canvas.

Course Learning Outcomes

Upon successful completion of the course students should be able to

(1) determine the polarization, reflection & transmission coefficients, and energy and power associated with homogeneous and inhomogeneous EM plane waves in simple media
(2) analyze EM waves in complex media such as plasma models of the ionosphere and single-negative and double-negative metamaterials
(3) determine expressions for near-zone and far-zone EM fields of current sources
(4) employ equivalence, image, and duality principles to recast a given EM problem into an equivalent problem incorporating different sources, different material parameters, etc.
(5) understand the classical approaches for solving EM boundary value problems
(6) utilize asymptotic techniques such as the method of stationary phase to develop approximate solutions to EM field problems.

Required Course Textbook

Notes prepared by the instructor are available through Canvas as pdf files and cover all class lectures.

There is no required course text; students who benefit from supplemental reading are encouraged to consider either of the optional texts:

J. Jin, *Theory and Computation of Electromagnetic Fields*, Wiley, 2015

G. S. Smith, *Classical Electromagnetic Radiation*. Cambridge University Press, 1997

Course Website and Other Classroom Management Tools

All course materials other than the textbook (class notes, supplementary videos, assignments) will be distributed through the GT Canvas system. Homework assignments must be uploaded through the Canvas system.

Detailed Course Schedule

Registered students may find a detailed course schedule on the Canvas site, including dates of the Quizzes and the Final Exam.

Grading Policy:

The weighting of various components of the course grade is as follows:

Weekly MiniQuizzes: 10% (administered through Canvas, completion grade only)
Weekly homework: 20% (assigned and collected through Canvas)
Quiz 1: 20%
Quiz 2: 20%
Final Exam: 30%

Description of Graded Components

Quizzes and the Final Exam will be administered in class for Section A students. Section Q students must arrange for proctors acceptable to Distance Learning. The Final Exam will be comprehensive.

There may be a MiniQuiz and a Homework Assignment due during the final class days.

Course grades will follow a nominal A = 90%/B = 80%/C = 70% definition, which may be curved to lower breakpoints.

Course Policies

Attendance and/or Participation

ECE 6350 is taught in multiple formats. Students enrolled in the A section are encouraged to attend the in-person classes.

Extensions, Late Assignments, & Rescheduled/Missed Exams

Students requiring an extension due to an approved institute activity or illness, or other legitimate reasons, should contact the instructor as early as possible to arrange an extension or makeup.

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. Review Georgia Tech's Honor Code and the student Code of Conduct.

Students in this class are expected to abide by the Georgia Tech Honor Code and avoid any instance of academic misconduct, including but not limited to:

- *Possessing, using, or exchanging improperly acquired oral or written information in the preparation of a quiz or exam.*
- *Submission of material that is substantially identical to that created or published by another individual, except as noted below.*
- *False claims of performance or work that has been submitted by the student.*

As the instructor, I will make available previous quiz problems so that all students have an equal opportunity to prepare and know what to expect. (Old quizzes will be posted the Canvas site.)

Any student suspected of cheating or plagiarism 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.

Collaboration and Group Work

Students are encouraged to work in groups of 2-3 in the preparation of homework assignments, provided that each student makes a "good faith" effort to contribute to the group effort and turns in their own writeup of the assignment

Use of Generative Artificial Intelligence

The use of AI generated work for homework assignments or quizzes/exams is not permitted.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) 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. The Student-Faculty Expectations articulate some basic expectations 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.

Campus Resources for Students

The Canvas system has an up-to-date link to "GT Student Resources" that includes a range of available resources. These include Emergency Resources, Mental & Physical Health Resources, Financial Assistance, Academic Support, Professional Enrichment, etc. Please explore these!