

EEC 130A Introductory Electromagnetics I – Winter Quarter 2025

Course description: Basics of static electric and magnetic fields and fields in materials. Work and scalar potential. Maxwell's equations in integral and differential form. Plane waves in lossless media. Lossless transmission lines.

Lecture: Mon, Wed 2:10-4 pm in Young Hall 184

STAFF

Instructor: Prof. Weijian Yang (weijyang@ucdavis)

Office hours: Mon 5-6pm, Wed 11am-noon in Kemper 3127

Teaching assistants: Omer Emre Ates (oates@ucdavis)

Problem solving sessions and TA office hours: In the problem-solving sessions, TAs will solve example problems relevant to the week's homework assignment. The problem solving sessions will last ~40 minutes and will be followed by ~40 minutes of TA office hours. Time and location TBD.

MATERIALS

Textbook:

Fundamentals of Applied Electromagnetics by Fawwaz T. Ulaby and Umberto Ravaioli, 8th Edition, Pearson, 2020.

It is very important to read the textbook carefully in addition to the lecture notes. (The 7th edition of the textbook is acceptable.) An eBook version of the text is also available; find the eBook at [this link](#). (The eBook should be automatically available if you participate in the [Equitable Access Program](#).) Lastly, it should be mentioned that **the textbook has a very useful [companion website](#)**. The site contains solutions to practice exercises, educational applets, and more information. This website will be a very useful resource throughout the quarter.

This course will cover Chapter 1~7 of this textbook.

ASSIGNMENTS

Homework: Homework assignments will be posted at least one week before their due dates. You must submit a scanned copy of your homework through Canvas. On your homework, please write your name, homework number, and course number. The homework will be graded within one and a half weeks after the homework is submitted. The homework solutions will be made available on Canvas.

Late work policy: Homework submitted late will not be graded and will not receive any credit. Each student will get one *late homework pass*; that is, each student may turn one homework assignment in up to a week late without losing any points on the assignment.

Mini-quizzes: Every class there will be a ~10 minute break, and during the break, a "mini-quiz" will be presented. The mini-quiz is typically two short questions. You are encouraged to think about the mini-quiz during class and discuss with your classmates. You will be required to submit your answers to the mini-quiz (through Canvas) by the end of the week (that is, by 11:59pm on Friday of the same week). The quizzes will be graded on a 0-2 scale.

QUIZZES AND EXAMS

Exams: There will be three quizzes in this course on the following schedule:

Quiz 1: Monday, February 3rd, 2:10 pm

Quiz 2: Wednesday, February 19th, 2:10 pm

Quiz 3: Wednesday, March 5th, 2:10 pm

Final exam: Thursday, March 20th, 1-3pm

Make-up exams: Requests for make-up examinations will only be approved in cases for which strong written justification can be provided. The instructor must be contacted, at least one week in advance, about missing an exam and requests for make-up exams.

GRADING

Your final letter grade will be based on the following breakdown

- Homework: 25%
- Mini-quizzes: 15%
- Quizzes: 30%
- Final Exam: 30%

Re-grading: If you think you deserve more credit for submitted work, write a short note indicating what should be reconsidered and give it to a TA or the instructor within one week after the graded material is returned.

COURSE FLOW

Week 1: Introduction, waves, and phasors; Distributed circuits and waves.

Week 2: Waves on transmission lines, impedances, and reflections; standing waves and power.

Week 3: Wave impedance. (01/20 University Holiday)

Week 4: Smith chart basics. (01/27 Quiz 1)

Week 5: Impedance matching and transients; Vector analysis, charges, and Coulomb's law.

Week 6: Charge distributions and potential; Electrostatic potential and Gauss' law.

Week 7: Gauss' law and conductors. (02/17 University Holiday; 02/19 Quiz 2)

Week 8: Conductors, capacitance, and dielectrics; Magnetic force and field.

Week 9: Biot-Savart and Ampere's laws; Inductance and materials. (03/05 Quiz 3)

Week 10: Induction and Faraday's law; Maxwell's equations and waves.

Final exam: Thursday, March 20th, 1-3pm

INTEGRITY

Academic integrity: Cheating and plagiarism will not be tolerated. Professional integrity is an important aspect of all engineering and scientific disciplines.

Course material distribution: The materials used in this course, including all recordings, lecture notes, homeworks, mini-quizzes, exams, etc., are protected by U.S. copyright law and by University policy. The instructor is the exclusive owner of these materials. You may not reproduce, distribute or display (post/upload) any of these materials without the expressed written consent of the instructor.

Acknowledge the Code of Academic Conduct: All students are required to acknowledge the [Code of Academic Conduct](#) for each registered course, no later than the quarter add deadline. my.ucdavis.edu will notify students online and through email about the required action.

Please read the code of Academic Conduct at <http://sja.ucdavis.edu/files/cac.pdf>

Please also visit <https://participate.ucdavis.edu/>

STUDENT LIFE FAQ

[Frequently Asked Questions - UC Davis Student Resources](#)