

**University of Southern California**  
**Ming Hsieh Department of Electrical Engineering**  
**EE 330 (Electromagnetics I)**

Fall Term 2018 (Session 001, Section 30463R)

Units: 3

Tuesday, Thursday, 14:00–15:20, SOS B4

- Instructor:** Alireza Tabatabaenejad (Taba)  
alirezat@usc.edu
- Office Hours:** Tuesday, 16:00–18:00 (or by appointment), DRB 226D
- Teaching Assistant:** Aravind Krishnan  
aravindk@usc.edu
- Office Hours:** Monday, 12:00–14:00, PHE 320
- Discussion:** Friday, 10:00–11:50, VHE 206  
Friday, 12:00–13:50, VHE 206  
Friday, 14:00–15:50, VHE 206
- Course Website:** blackboard.usc.edu
- Calendar:** <https://goo.gl/mK3vaV>
- Twitter:** @USC\_EE330
- Primary Text:** Fawwaz T. Ulaby and Umberto Ravaioli, *Fundamentals of Applied Electromagnetics (7th Edition)*; Website: <http://em7e.eecs.umich.edu/>
- Other References:** David K. Cheng, *Field and Wave Electromagnetics*  
Matthew Sadiku, *Elements of Electromagnetics*  
Kraus and Fleisch, *Electromagnetics with Applications*  
U. Inan and A. Inan, *Electromagnetic Waves*  
Hayt and Buck, *Engineering Electromagnetics*
- Grade Breakdown:**
- |                                |     |
|--------------------------------|-----|
| 10 Homework Sets               | 30% |
| Midterm Exam                   | 25% |
| Weekly Quizzes (in Discussion) | 20% |
| Final Exam                     | 25% |

**Final Course Grade:** Final course grades will be calculated based on the above Grade Breakdown. The letter grades will be assigned based on 10-point intervals starting from 100. You will not be graded on a curve.

- Important Dates:**
- |                    |                         |
|--------------------|-------------------------|
| First Day of Class | 08/21/2018              |
| Midterm Exam       | 10/04/2018, 14:00–15:20 |
| Thanksgiving       | 11/21/2018–11/25/2018   |
| Last Day of Class  | 11/29/2018              |
| Final Exam         | 12/06/2018, 14:00–16:00 |

## Homework

All homework sets are due in class one week following assignment. Late homework will not be accepted. Solutions will be posted on the course website 2–3 days after due date.

## Prerequisite

You are expected to be familiar with circuit analysis, Ohm's law, Kirchhoff's current and voltage laws, and undergraduate calculus.

## Course Description

This course will cover basic static and dynamic electromagnetic field theory and applications, electrostatics, magnetostatics, Maxwell's equations, energy flow, plane waves incident on planar boundaries, and transmission lines.

## Learning Objectives

By taking this course, you will gain a deeper understanding of electromagnetic concepts and applications. Particularly, you will learn

- Analysis and design of transmission line circuits
- Spatial patterns of the electric and magnetic fields induced by charges and currents
- The gradient, divergence, and curl operation on spatial functions
- The temporal and spatial waveforms of plane waves propagating in lossless and lossy media
- Field distributions inside a rectangular waveguide
- Basics of antennas and radiation pattern of linear antennas

## Miscellaneous Information

1. All exams are closed-book. You may use a calculator and notes written on both sides of a single 8.5"×11" sheet of paper. You will be tested on all material covered in class, on the assigned readings, and on the homework problems as well as problems similar to those. Please bring your USC ID card to each exam; it may be checked during the exam.
2. You must take the exams at the scheduled times. If you are absent during an exam, you will receive a grade of zero unless you have a valid reason for your absence and you have discussed it with the professor prior to the exam. A student must discuss a final examination conflict with the professor no later than two weeks prior to the scheduled examination date to arrange an acceptable alternate examination date and time.
3. The weekly quizzes are short (~15 minutes in duration) and are given during the discussion sessions. They are closed-book, closed-notes, and given throughout the semester. They cover material from the preceding week's lecture and homework.

## University Policy on Grading and Correction of Grades

Grading is consistent with the with the "Grading and Correction of Grades" handbook.

## Honor Code

The common-sense honor code applies to all aspects of this course. The fine print is below on the specific issue of how much collaboration is permissible among students in the preparation of solutions to problem assignments. Bottom line is that all homework assignments are to be completed on your own. You are allowed, and encouraged, to consult with other students in the current class regarding the general approach to solving problems, but all work submitted by you

must be your work alone. It is important that you learn how to do these problems on your own. You are not allowed to possess or in any way derive advantage from the existing solutions prepared in previous years by former students, earlier professors, or from on-line sources. Violations of this policy are grounds for disciplinary actions filed with the Deans Office. If you have any questions or are in doubt, do not hesitate to ask for clarification.

### **USC Statement on Academic Integrity**

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. *SCampus*, the Student Guidebook, contains the Student Conduct Code as well as the recommended sanctions.

### **USC Statement for Students with Disabilities**

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to the instructor (or to TA) as early in the semester as possible.

### **Student Scheduling Conflicts**

No student is permitted to omit or take early a final examination and no instructor is authorized to permit a student to do so. Students should plan to avoid scheduling conflicts in their final examinations. If a student is scheduled for two final examinations at the same time, the student should request to take one of the examinations on a different day or time. If a student is scheduled for more than two final examinations in one day, the student may request to take one of the exams on a different day or time. In either situation, the student must contact the professors involved no later than two weeks prior to the scheduled examination date and request an accommodation. If an accommodation cannot be arranged, the student should contact USC Testing Services at [testing@usc.edu](mailto:testing@usc.edu) or (213) 740-7166 for assistance. Grades are due 96 hours after the university-scheduled final examination day and time. Therefore, it might not be possible to accommodate late student requests for an alternate, makeup final examination after the published examination period.

### **Religious Holy Days**

University policy grants students excused absences from class for observance of religious holy days. Students are advised to scan their syllabi at the beginning of each course to detect potential conflicts with their religious observances. Please note that this applies only to the holy days that necessitate absence from class and/or whose religious requirements clearly conflict with aspects of academic performance. Students should contact the faculty in advance to request such an excused absence. The student will be given an opportunity to make up missed work because of religious observance.

When a final examination is scheduled at a time that conflicts with a student's observance of a holy day, the student must discuss the conflict with the professor no later than two weeks prior to the scheduled examination date to arrange an acceptable alternate examination date and time.

The student may reach out to the Office of Religious Life at (213) 740-6110 or [vasoni@usc.edu](mailto:vasoni@usc.edu) (Dean of Religious Life) for guidance.

### **Documented Emergencies**

In the case of a documented emergency that occurs after the withdrawal date and/or during the final exam period, students should consult the professor about receiving a grade of Incomplete (IN) for the semester. Faculty and students alike should refer to the rules regarding the mark of Incomplete at the time of the request.

### **Emergency Preparedness/Course Continuity in a Crisis**

In case of a declared emergency, if travel to campus is not feasible, USC executive leadership will announce an electronic way for instructors to teach students in their residence halls or homes using a combination of Blackboard, teleconferencing, and other technologies. See the University's Website on Campus Safety and Emergency Preparedness.

**Lecture Schedule (Subject to Change)**

<b>Week</b>	<b>Dates</b>	<b>Covered Material</b>
1	08/21, 08/23	Chapter 1
2	08/28, 08/30	Chapter 2
3	09/04, 09/06	Chapter 2
4	09/11, 09/13	Chapter 3
5	09/18, 09/20	Chapter 3
6	09/25, 09/27	Chapter 4
7	10/02	Chapter 4
8	10/09, 10/11	Chapter 4, Chapter 5
9	10/16, 10/18	Chapter 5
10	10/23, 10/25	Chapter 6
11	10/30, 11/01	Chapter 6, Chapter 7
12	11/06, 11/08	Chapter 7
13	11/13, 11/15	Chapter 8
14	11/20	Chapter 8
15	11/27, 11/29	Review