

PURDUE

UNIVERSITY

**SCHOOL OF ELECTRICAL
AND COMPUTER ENGINEERING
UNDERGRADUATE COUNSELING OFFICE**

Engineering Faculty Document 89-19
February 11, 2019
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To: The Engineering Faculty
From: School of Electrical and Computer Engineering
Re: ECE 30412

The School of Electrical and Computer Engineering has approved the following new course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

ECE 30412 Electromagnetics II

Semesters offered: Fall

Non-repeatable

Credit 3

Pre/Co-requisites: ECE 30411 or ECE 31100

Requisites by Topic: Introductory electromagnetics

Course Description

Electromagnetics II builds on Electromagnetics I (ECE 30411 or ECE 31100) and emphasizes time-varying electromagnetic fields. Both fundamental understanding and an appreciation for applications that span all technologies related to electrical and computer engineering are emphasized. The topics covered include: Maxwell's equations, plane waves, transmission lines, waveguides and cavities, and antennas and radiation. Applications addressed relate to photonics, communications, and imaging and sensing. More generally, illustrations cover the basic principles on which devices and systems used every day operate.

Reason

There was a significant gap between the material in ECE 31100 and ECE 44100 causing students came into ECE 41100 without the background needed to successfully start the course. To fix this, ECE 31100 has been modified and is to become ECE 30411 as part 1 of the sequence, and ECE 30412 is being developed to become part 2 of the sequence. ECE 44100 will no longer be offered.

History of Previous Offering

This is the second offering of this course.



Michael R. Melloch, Associate Department Head of ECE

ECE 39595E Electromagnetics II

Fall 2018

Class

MWF 11:30 am - 12:20 pm
EE 115

Professor

Kevin J. Webb
Office: EE 314
Ph: 49-43373
Email: webb@purdue.edu

Office hours:
M - 9:30 am - 10:30 am
Tu - 9:00 am - 10:00 am
Th - 9:00 am - 10:00 am

Assistant

Mary Ann Satterfield
Office: EE 326B
Ph: 494-6389
Email: msaterfi@purdue.edu
Office hours:
M-F - 8:00 am - 12:00 pm
M-F - 1:00 pm - 5:00 pm

Textbook

- D. K. Cheng, Field and Wave Electromagnetics, 2nd. ed., Addison-Wesley, 1989.

References

- S. Ramo, J. R. Whinnery, and T. Van Duzer, Fields and Waves in Communication Electronics, 3rd. ed., Wiley, 1994.

Grading

Homework	20 points
Test # 1	20 points
Test # 2	20 points
Final Exam	40 points
Total	100 points

We will use the plus/minus grading system.

Homework

Homework assignments will be due in the neighborhood of weekly or fortnightly. Late homework will not be accepted. Please write your solutions legibly and in an organized manner so that the grader can follow your work easily, and, where possible, draw a box around your final answer. You may work together as you solve your homework problems, as this can be an effective means of learning the material. If you do work in a group, be sure that the solution you turn in is your own work. This is the only way to learn the material. All people submitting identical copies of a solution will receive zero credit.

Exam Schedule

The tests during the semester will be held during our regular class time and in the class room.

	Date
Test 1	Friday, October 12, 2018: 11:30 am in EE115
Test 2	Wednesday, November 14, 2018: 11:30 am in EE115
Final Exam	Wednesday, December 12, 2018: 8:00 am in EE224

Exam Regrade Policy

If you believe an error was made in grading your exam, a request for a regrade must be filed with your professor within *one week* after the exam has been returned. No such requests will be honored after the one-week deadline has passed. Do not mark on the original exam.

Academic Honesty

Any case of academic dishonesty will result in a grade of F in this course.

Course Outcomes

A student who successfully fulfills the course requirements will have demonstrated and understanding of:

1. Time-varying fields and Maxwell's equations
2. Plane electromagnetic waves
3. The theory and application of transmission lines
4. Waveguides and cavity resonators
5. Antennas and radiating systems

You will have more than one opportunity to satisfy each of the Course Outcomes. The primary means will be through the regular hourly and final exams. I will write questions for each exam around each of the Course Outcomes. You will satisfy each Course Outcome when your score for the test question(s) equals or exceeds a value I specify as representing a minimal competency. If you fail to meet this level of minimal competency on a specific Course Outcome, you will have a second chance by taking a retest. The retest will not affect your exam score, but will allow you a second opportunity to demonstrate your competency in the course material, thus satisfying the Course Outcome. Finally, you may be able to satisfy outcomes on later exams that cover overlapping material.

Campus Closing/Disruption of Classes

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. In such an event, information will be provided through Blackboard Learn.

Class Attendance

Your attendance at class is important. If you must miss class, you are responsible for any material, information, handouts, announcements, etc. you missed.

Course Outline

Week	Topics	Cheng
1	Time-varying fields and Maxwell's equations	Ch. 7
2	Time-varying fields and Maxwell's equations	Ch. 7
3	Time-varying fields and Maxwell's equations	Ch. 7
4	Plane electromagnetic waves	Ch. 8
5	Plane electromagnetic waves	Ch. 8
6	Plane electromagnetic waves	Ch. 8
7	Theory and application of transmission lines	Ch. 9
8	Theory and application of transmission lines	Ch. 9
9	Theory and application of transmission lines	Ch. 9
10	Waveguides and cavity resonators	Ch. 10
11	Waveguides and cavity resonators	Ch. 10
12	Waveguides and cavity resonators	Ch. 10
13	Antennas and radiating systems	Ch. 11
14	Antennas and radiating systems	Ch. 11
15	Antennas and radiating systems	Ch. 11
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