

Electromagnetic Fields and Waves
ECE 360 – in-class and on-line sections
Spring 2020
Course Outline and Syllabus – Updated 01/29/2020

Professor: Edl Schamiloglu, Distinguished Professor of Electrical and Computer Engineering; Associate Dean for Research and Innovation, School of Engineering; Special Assistant to the Provost for Laboratory Relations

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Lectures: Tu Th 5:30-6:45 PM
Woodward-149 – Sec 002 students are welcome to attend the lectures if they wish; otherwise, the recordings will be posted under [Mediasite Recordings](#) at the bottom of the Learn.unm.edu website for this course and available to all students.

Laboratory Section: This semester ECE 360 is 4 credit hours. The Laboratory Section will be **Wednesdays 1:00-1:50 PM or Wednesdays 2:00-2:50 PM in ECE 118**. During the Laboratory Section the TA (Dmitrii Andreev) will solve problems, take questions, and discuss computer exercises (second half of the semester). Students need to attend one of these two sessions each. **For students unable to attend one of these two sessions regardless of which section they are registered for should email me for alternate arrangements.** Your attendance in these laboratory sessions will contribute up to 20% of your grade. There will be 11 weeks of Laboratory Sections. Your grade for the Laboratory Section will be assigned as follows:

Attend all 11 weeks – 20 points; attend 10 weeks – 18 points; attend 9 weeks – 16 points; attend 8 weeks – 14 points; attend 7 weeks – 12 points; attend 6 weeks – 10 points; attend 5 weeks or fewer – 0 points

For students in the on-line section who cannot come to one of the Wednesday sessions and for any student who has a conflict here is the alternate: I will send students a quiz with 10 short answer/true-false questions and ask them to complete them. The purpose is to emphasize what I believe are important concepts. I will grade these for the students' benefit, but the grade will not impact the students' course grade. If a student completes 11 quizzes (regardless of how s/he did on it) s/he will receive the full 20 points. If a student completes 10 s/he will receive 18 points. And so on, similar to attendance. These quizzes should take 5-10 minutes to complete.

Office Hours: By appointment only [since I assumed the position of Associate Dean for Research and Innovation for the School of Engineering, I will not be able to reliably be in my office for office hours. If you would like to speak with me regarding the course, I recommend emailing me so that we can arrange for a time to meet.]

Prerequisites: ECE 213, PHYC 161; MATH 264

Textbook: 7th Edition of Sadiku, *Elements of Electromagnetics*. We will cover Chapters 9-13 after quickly reviewing Chapters 1-8. Supplemental material will also be provided.



Course Website: <http://learn.unm.edu>. You will need your UNM NET ID to access this page if you are registered for the course.

Course Objectives: This course is a prerequisite to all higher-level courses in Applied Electromagnetics. We will cover Maxwell's equations, plane wave propagation, waveguides and transmission lines, transient pulse propagation, and dipole antenna.

Grading: Problem sets [every two weeks, to be scanned and uploaded to the assignment tool] (25%), two exams (25%) a final exam (30%), and participation in the Laboratory Section (20%).

Lecture Schedule¹

<u>Week#</u>	<u>Day</u>	<u>Date</u>	<u>Topic</u>	<u>Text Chapter/Ref.</u>
1	Tu	21 Jan	Brief intro and Review	Chapters 1-8
	Th	23 Jan	Brief intro and Review	Chapters 1-8
Laboratory Section begins Week 2				
2	Tu	28 Jan	Maxwell's Equations	Chapter 9
	Th	30 Jan	Maxwell's Equations	Chapter 9
3	Tu	04 Feb	Maxwell's Equations	Chapter 9
	Th	06 Feb	Maxwell's Equations	Chapter 9-Chapter 10
4	Tu	11 Feb	Electromagnetic Wave Propagation	Chapter 10
	Th	13 Feb	Electromagnetic Wave Propagation	Chapter 10
5	Tu	18 Feb	Electromagnetic Wave Propagation	Chapter 10
	Th	20 Feb	Electromagnetic Wave Propagation	Chapter 10
6	Tu	25 Feb	Electromagnetic Wave Propagation	Chapter 10
	Th	27 Feb	Transmission Lines	Chapter 11
7	Tu	03 Mar	Transmission Lines	Chapter 11
	Th	05 Mar	Transmission Lines	Chapter 11
No Laboratory Section Week 8				
8	Tu	10 Mar	No Class – Study Day	
	Th	12 Mar	Exam #1	
Spring Break March 16-20				
9	Tu	24 Mar	Metamaterials	Chapter 11
	Th	26 Mar	Waveguides	Chapter 12
10	Tu	31 Mar	Waveguides	Chapter 12
	Th	02 Apr	Waveguides	Chapter 12
11	Tu	07 Apr	Waveguides	Chapter 12
	Th	09 Apr	Waveguides	Chapter 12
No Laboratory Section Week 12				
12	Tu	14 Apr	Exam #2	
	Th	16 Apr	Antennas	Chapter 13
13	Tu	21 Apr	Antennas	Chapter 13
	Th	23 Apr	Antennas	Chapter 13
14	Tu	28 Apr	Antennas	Chapter 13
	Th	30 Apr	Antennas	Chapter 13
No Laboratory Section Week 15				
15	Tu	05 May	Review for Final Exam – I	
	Th	07 May	Review for Final Exam – II	

¹ NOTE: I will miss a few lectures due to program reviews, travel, etc. I will provide an updated list of those dates as they become available. Ph.D. student Dmitrii Andreev will be the guest lecturer for the classes I will miss.