

EE 434 Electromagnetic Waves

Course title:

Electromagnetic Waves

Class hours:

Monday, Wednesday, Friday 13:00-13:50

Office hours:

TBD

Instructor:

Dr. Anders M. Jorgensen

Workman 227

Phone: 505-835-5450

e-mail: anders@nmt.edu

Classroom location:

Workman 109

Textbook:

- *Magdy F. Iskander*, Electromagnetic Fields and Waves, Waveland Press Inc, 2000.

Learning objectives:

1. Expand your basic knowledge of electromagnetic waves.
2. Improve your physical intuitive understanding of electromagnetic phenomena.
3. Understand and be able to use Maxwell's equations.
4. Understand the principles of wave reflection and transmission, wave guides, and antenna radiation.

Prerequisites:

EE 333 (Electricity and Magnetism)

Topics covered:

This course will build on the your knowledge of Maxwell's equations developed in EE 333. We will apply the concepts to several practical problems. We will cover three topics in this course: we begin by discussing reflection and transmission of electromagnetic waves at interfaces. Parts of it will be very similar to our treatment of transmission lines. Then we will discuss hollow waveguides for transmitting very high frequency waves, and then antennas and antenna arrays.

1. Normal and oblique incidence reflection and transmission at interfaces.
2. Waveguides
3. Optical fibers
4. Antennas and antenna arrays

Course work:

1. Reading. I expect you to keep up with the course by reading the assigned sections in the book before each class.
2. Active participation in class. Show up and respond to questions.
3. Homework. Assigned approximately weekly.

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4. Exams. There will be a total of three exams during the semester and a final exam during finals week.

Grading policy:

1. Homework 40%
2. Best 3 of 3 Exams and final exam 60%

Approximate Lecture Schedule:

Week of	Lecture	Exam
Jan 20	Course introduction	
Jan 25	Normal incidence reflection and transmission	
Feb 1		
Feb 8	Oblique angle incidence reflection and transmission	
Feb 15		
Feb 22		
Mar 1		1
Mar 8	Wave guides	
Mar 15	SPRING BREAK	
Mar 22		
Mar 29		
Apr 5		2
Apr 12	Antennas and antenna arrays	
Apr 19		
Apr 26		
May 3		3