

**Department of Electrical & Computer Engineering
The University of Kansas**

EECS 720- Electromagnetics for Communications and Radar Fall, 2008

Description: Topics in electromagnetics relevant to wireless communications, optics and fiberoptics, radar, and remote sensing. Subjects covered include space waves, guided waves, radiation and antennas, scattering, electromagnetic properties of materials, and optics. 3 hrs. Credit. Prerequisite: EECS 420 or equivalent.

Objective: To provide the electromagnetic background needed to apply electromagnetic effects to communication and radar applications.

Text: **Fields and Waves in Communication Electronics**, third edition, by Ramo, Whinnery, and VanDuzer, Prentice Hall, 1994

Prerequisites by Topics:

- Vector Analysis
- Maxwell's equations (integral and differential formulations)
- Travelling waves

Course Topics:

- Maxwell's equations
- Boundary value analysis
- Plane Waves
- Reflection, transmission, scattering, and diffraction
- Guided Waves in metal and dielectric waveguides
- Radiation and antennas
- Electromagnetic properties of materials
- Optics

Grading: The following percentages will be used to arrive at the final grade scores

- Exam I 25
- Exam II 25
- Final Exam 25
- Homework 25

Final letter grades are determined from the above grade scores according to a scale that is dependent on the instructor's perception of the overall class performance vs. the difficulty of the exams, but will is often similar to the typical 90-100 A, 80-90 B, etc.

Homework: Homework will be collected at the beginning of class on a bi-weekly basis. Late homework is not accepted, except for unusual circumstances. Collaboration with classmates is permitted. Copying is *not* permitted and will be penalized.

Instructor: Kenneth R. Demarest

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Office Hours: 8:30 - 9:30 MW (Eaton)
11:00-11:30 MWF (Eaton)
3:00 - 4:00 F (Eaton)
T,R (325 Nichols Hall, by appointment)

Syllabus

Week	Topic/Chapter
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1-2	Electrostatic fields/ Chapter 1
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3	Magnetostatic fields/ Chapter 2
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4	Time-varying fields and Maxwell's equations/ Chapter 3
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5-6	Plane Waves, reflection, diffraction, scattering/ Chapter 6
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Exam I

7-8	Waveguides/ Chapters 8&9 and sections 14.8-14:12
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9	Cavities/Chapter 10
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10	EM computational techniques
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Exam II

11-14	Radiation and antennas/ Chapter 12
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Final Exam (Friday, December 19, 1:30-4:00 p.m.)