EECS412-Electromagnetic Field Theory III
Prof. Frank Merat
Fall 2002 Semester

Textbook:
Electromagnetic Waves
Umran S. Inan and Aziz S. Inan
Prentice Hall
ISBN 0-201-36179-5

Web page: http://vorlon.cwru.edu/~flm/eecs412/home.html

TENTATIVE SYLLABUS

TOPIC	READING *	COMMENTS
Review of Fields I Topics (6 lectures)	Any fields textbook	
• Electric Flux and Gauss's Law, electric dipole		
• Poisson's & Laplace's Equations, capacitance		
• Electrostatic boundary conditions		
• Ampere's law, magnetic dipole		
• Inductance		Take home exam
Planes waves in unbounded media (9 lectures)		
• Intro to plane Introduction, Maxwell's Equations	1-14	
• Plane Waves in Lossless Media	15-35	
• Plane Waves in Conducting Media	38-45	
• Conductors/Dielectrics and Skin Effect	45-59	HW#1
• Flow of Electromagnetic Power	59-75	
• Wave Polarization	78-95	
• Arbitrary Uniform Plane Waves	96-104	HW#2
Reflection, Transmission & Refraction at Planar Interfaces (6 lectures)		
• Reflection at Normal Incidence	120-131	
• Normal Incidence on a Dielectric	132-140	
• Multiple Dielectric Interfaces	140-155	HW#3
• Oblique Incidence on a Conductor	155-167	
• Reflection/Refraction at Oblique Incidence	167-188	
• Total Internal Reflection	189-201	HW#4
• Reflection/Refraction from Lossy Media	201-215	

TAKE HOME MID-TERM EXAM

Parallel Plate and Dielectric Slab Waveguides (5 lectures)

• Parallel Plate Waveguide	249-286	HW#5
• Dielectric Waveguides	286-307	HW#6
• Wave Velocities	307-319	

Waves and transmission lines (6 lectures)	Supplemental notes	
• Transmission behavior & circuit models		
• Bounce diagrams		
• Standing wave patterns		
• Transmission line impedance		HW#7
• Impedance matching		
• Smith charts		
• Two-port networks, s-parameters		HW#8

Cylindrical Waveguides & Cavity Resonators (6 lectures)		
• Rectangular Waveguides	331-353	
• Circular Waveguides	353-378	HW#9
• Cavity Resonators	378-400	

Antennas (5 lectures)	Supplemental notes.	
• Elementary Antennas	476-494	
• Monopoles and Dipoles		HW#10

FINAL EXAM (December 13th, 8:00-11:00 a.m.)

GRADING:

Take home review exam	10%
Mid-term exam	25%
Final exam	25%
Homework	40%