

EO2652
FIELDS, WAVES, AND ELECTROMAGNETIC ENGINEERING (4-1)
Winter 2003

Lecture	Topics Covered (Tentative)
1	Introduction; nature of EM; notation
2	Traveling waves
3	Waves in lossy media; phasors; sinusoidal waves
4	Transmission line equations
5	Finite lines and standing waves
6	Slotted line measurements
7	Smith charts
8	Matching loads to transmission lines
9	Review of vector calculus and coordinate systems
10	Divergence, curl, gradient and Laplacian
11	Stokes's Law and the divergence theorem
12	Gauss's Law; Coulomb's Law
13	Charge distributions
14	Potential; Poisson's Equation; Laplace's Equation
15	Dielectrics; conductors; flux density
16	Resistance and ohmic loss; Joule's Law
17	Capacitance
18	Electrostatic energy and force
19	Magnetostatics; Biot-Savart Law
20	Ampere's Law
21	Magnetic field intensity and magnetization
22	Magnetic materials; boundary conditions
23	Faraday's Law; Lenz's Law
24	Transformers and induction
25	Continuity equation; displacement current
26	Maxwell's Equations
27	Wave equation and plane waves
28	Polarization; propagation in lossy media
29	Good conductors; skin depth; group velocity
30	Poynting vector and power flow
31	Plane wave reflection and refraction (normal incidence)
32	Plane wave reflection and refraction (oblique incidence)
33	Plane wave examples
34	Fiber optics waveguides; overview of EM systems
35	General TM and TE behavior in waveguides
36	Rectangular waveguides
37	Waveguide devices and examples
38	Resonators

Time permitting