

**University of Maryland  
Department of Physics**

Physics 606

Spring 2016

Tentative Schedule

Topic	Text Chapters	Lectures <sup>1</sup>
Fundamentals of Electrostatics	1.1 – 1.8	
Energy, Capacitance, Variational Approach	1.11 – 1.13	
Method of Images, Fields Near Corners, Finite Elements	2.1 – 2.6, 2.11, 2.12	
Fields Near Protrusions	3.4	
Multipoles, Dielectrics	4.1 – 4.7	
	Exam 1	TBD
Magnetostatics, Ampere's Law, Biot-Savart Law, Scalar Potential, Vector Potential	5.1 – 5.12	
Faraday's Law, Magnetic Energy, Self and Mutual Inductance	5.15 – 5.17	
Maxwell's Displacement Current and Equations, Conservation Laws, Gauge transformations	6.1 – 6.9	
Plane Waves, Polarization, Reflection at Discontinuities	7.1 – 7.4	
Dispersion, frequency-dependent dielectrics, Foster's theorem, pulse propagation	7.5 – 7.11	
	Exam 2	TBD
Guided Waves, conducting waveguides, optical waveguides, cavities, transmission lines	8.1 – 8.5	
Radiation, moving charges, antennas, coherent/incoherent	9.1 – 9.4	
Special Relativity, transformations, Energy and Momentum, Charged Particle Motion in Strong Fields, Lagrangian Density	11.3 – 11.6	
Special Topics: by popular demand Diffraction Scattering Metamaterials Plasma Oscillations and Waves Surface Plasma Waves		
	Final Exam	Thursday May 12*

1 Lecture is two 50 minute periods.  
\* Subject to change