Physics 161b, Fall 2007
Electro-magnetic Theory, II
Prof. Schnitzer

1) Maxwell's equations, and various exact properties of radiation.

2) Gauge dependence of potentials. Material will be presented in Lorentz gauge.

3) Solution of wave eqation by fourier decomposition. Helmholtz equation.

4) Long wave limit

5) Lenard-Wiechert potentials and applications:
   a) synchrotron radiation,
   b) bremstrahlung ,
   c) particle with constant velocity

6) Scattering of radiation. Thompson scattering; Rayleigh scattering , and applications to classical electron theory of index of refraction.

7) Duality and magnetic monopoles. Dirac quantization of electric charge.

8) Dirac's classical electron theory (relativistic invariant theory). runaway solutions vs. acausal behavior.

9) Wave-guides

10) Special topics, time permitting.