PHYS 212 Spring 2014 Study Guide for Test #3     Chapters 25, 26, 27, and 28

Test will consist of regular questions, problems, and derivations.

**Chapter 25: Capacitors**
Charge:  Stored energy: 
Capacitance of a Parallel plate capacitor: $C=\frac{Kϵ\_{0}A}{d}$
 **Capacitors in Parallel and Series:**
 

**Chapter 26 & 27:** Current (i), current density (J), resistance (R), and power (P):

   

Estimating the cost of electricity. Semiconductors and Superconductors.
Ohm’s law: v = iR Power:   

**Resistors in Series and in Parallel:**



Analyzing circuits using junction rule and loop rule.

 **Chapter 28:**Electric force on a charge: $ \vec{F}=q\vec{E}$ Magnetic force on a moving charge: 

Net force on a moving charge in electric and magnetic fields: $\vec{F}=q\vec{E}+q\vec{v}×\vec{B}$

Vector cross product: $ \hat{i}×\hat{j}=\hat{k}$ $\hat{j}×\hat{i}=-\hat{k}$ $\hat{i}×\hat{i}=0$

Vector cross product: $\vec{a}×\vec{b}=ab\sin(θ)$, where *θ* is the angle between the vectors.
$$a=\sqrt{a\_{x}^{2}+a\_{y}^{2}+a\_{z}^{2}}$$

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| A Charged Particle Circulating in a Magnetic Field: http://edugen.wiley.com/edugen/courses/crs1650/art/math/halliday8019c28/math156.gif**Magnetic Force on a Current-Carrying Wire** A straight wire carrying a current *i* in a uniform magnetic field experiences a sideways force: |
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