**PHYS 202     Study Guide for Test #1   Chap 12, 15, 18**Test will consist of MC questions, questions, and problems.  
 **Temperature & Heat, Chapter 12:1-8**

* **Temperature** and **Thermometers:** Temperature scales and different types of thermometers.
* **Temperature conversion**: Tf = (9/5) Tc + 32,  Tk = Tc + 273.
* **Thermal Expansion:** Linear, area, and volume thermal expansion and bi-metallic strip.  
      
* What is **Heat** and how is it related to **Temperature** and **Internal Energy**?
* How do I use **Specific Heat** and **Latent Heat** to solve **Calorimetry** problems?   
  Q = mcΔT. Q = mL.

**Chapter 15: The Laws of Thermodynamics**

1. Laws of **Thermodynamics: Zeroth, First, Second, and Third.**
2. Thermodynamic Processes: Isobaric, Isothermal, Isochoric, and Adiabatic.
3. First law of thermodynamics: ΔU = Q – W
4. Work done by a gas: W = P∙ΔV (Isobaric process) (Isothermal process)
5. Heat engines, refrigerators, and heat pumps.
   * Coefficient of performance,   
     Entropy, *S*. 

**Chapters 18: Electric Forces and Electric Fields**

1. Understanding terms: Electric charges (positive and negative), test charge, conductors, insulators, semiconductors, superconductors, electric field, and Gauss’ law.

2. Know the following:

* a. How to charge an object by contact and by induction.
* b. Coulomb's law and how to use it to find the force, including net force between multiple charges.
* c. Draw equipotential lines and electric field lines of point charges and extended charges.
* d. Coulomb's law:   sgt2CouLaw
* e. Electric field due to a point charge at a distance r:      sgt2EduetoQ
* f. Determining the net electric field due to multiple point charges.