HW Topics for Electronic Instrumentation.
*Each homework assignment addresses topics associated with the corresponding experiment.*

1. HW 1
   a. Combining resistors
   b. Solving for currents and voltages in resistive circuits
   c. Resistive circuits from exp 1
   d. Reading resistor values
   e. What is current?
   f. Lissajou pattern
   g. Inductors and capacitors at high and low frequencies
   h. Sine wave amplitudes
   i. Complex number arithmetic

2. HW 2
   a. Impedance of an inductor
   b. Simplified performance of inductors and capacitors at high and low frequencies
   c. Total impedance of combination of R, L and Cs
   d. Transfer function
   e. Corner frequency
   f. Functional form of transfer functions at high and low frequencies (remember that these are for high and low, not infinity and zero for frequency)
   g. Combining R, L and C
   h. Resonant frequency
   i. Phase angle and complex numbers

3. HW3
   a. Calculating inductance and resistance
   b. Modeling transformers
   c. Finding output voltages and currents from input voltages and currents.
   d. Input impedance of a loaded transformer
   e. Resistive circuits
   f. Transfer functions

4. HW 4
   a. Op-amp configurations
   b. Op-amp transfer functions
   c. Op-amp, golden rules
   d. Phase shift
   e. Inverting and non-inverting amps
   f. Integrators and differentiators
   g. Buffers, Adders

5.  HW 5
    a.  Wheatstone bridge
    b.  Thevenin equivalent
    c.  Damped oscillators, decay constants
6.  HW 6
    a.  Transistor as a switch
    b.  Operating regions for a transistor
    c.  Schmitt Trigger
    d.  Logic Gates
    e.  Relays
7.  HW 7
    a.  Digital Logic
    b.  Combinational logic
    c.  Truth tables
    d.  Converting between number systems
    e.  Flip-flop
    f.  Counter
    g.  555 Timer
    h.  Diode
8.  HW 8
    a.  Diode circuits – rectifiers, voltage protection
    b.  Diode characteristics
    c.  Zener diode
    d.  LED and phototransistor

Videos

*The video lectures for each of the HW problems are generally found listed under the appropriate experiment number, since each HW assignment addresses the same information as found in the corresponding experiment. The content of each lecture is listed on YouTube, the LMS site and the EI Lectures page (http://www.ecse.rpi.edu/courses/S13/ENGR-2300/EILectures.html)*