MEEN 2210 Electromechanical Engineering Systems Spring 2011

Studio Exercises Week #2

- Breadboard Basics. Understand how a breadboard is partitioned. Use the multimeter to test for continuity between rows and columns. Know where an op-amp should be placed.
- Measure resistor resistance and power-supply voltage with the digital multimeter. Note color coding and tolerance of resistors. Determine if the resistance values are within resistor tolerance.
- Measure four resistor resistances with the digital multimeter: two 1KΩ resistors and two 1MΩ resistors. Note color coding and tolerance value. Document your readings.
- **Circuit Loading Exercise**
  - **Never measure before you predict!**
  - For a voltage divider, predict the output voltage.
    - 5-volt DC input and two 1 KΩ resistors. Use actual measured power supply voltage and measured resistor values in your calculation.
    - 5-volt DC input and two 1MΩ resistors. Use actual measured power supply voltage and measured resistor values in your calculation.
  - Build the voltage divider on the breadboard with a 5-volt DC input and two 1KΩ resistors. Measure the output voltage. Compare the measurement to the prediction.
  - Build the voltage divider on the breadboard with a 5-volt DC input and two 1MΩ resistors. Measure the output voltage. Compare the measurement to the prediction.
  - What did you observe from these two experiments? Differences between prediction and measurement? Explanation?
- **Current Measuring Exercise**
  - **Never measure before you predict!**
  - For the voltage divider with the two 1 KΩ resistors, predict the current in the two series resistors. Is the predicted current the same in both resistors?
  - Now measure the current in the voltage divider with the two 1 KΩ resistors. How must the multimeter be placed with respect to the circuit to measure the current? How did you have to adjust the meter probes to read amps?
  - Compare the measurement to the prediction. Does the multimeter have any effect on the current measurement?