The midterm exam covers the first five experiments of the semester. All the theory covered in class and in the book is fair game.

Recommendations for preparation:
- Review the lab problems for Labs 1 through 5.
- Skim the lab reports for Labs 1 through 5.
- Review AC and DC circuit analysis skills.

- **Chapter 1: DC Circuit Measurement and Analysis**
  - Effect of placing a meter in a circuit
  - Effect of a meter’s scale on measurements (20mA vs. 200mA, etc)
  - Indirect current measurement (voltage across resistor)
  - Percent error
  - Voltage/Current divider
  - Reduction of series/parallel resistors
  - Thevenin/Norton equivalents
  - Source transformation

- **Chapter 2: The Oscilloscope and Transient Analysis**
  - RC circuit analysis
  - Electrical representation of the probe
  - Probe effects on a circuit
  - Effect of improper grounding on a circuit
  - RL circuit analysis
  - Relay analysis (ex: Find $V_{CH2}$ in Fig 2-25 for $V_t$ square wave between 0 and $V_{pp}$, and any $R_3$, $R_4$)
  - RLC circuit analysis

- **Chapter 3: AC Circuit Analysis**
  - Phasor analysis (converting between $X\angle \theta$ to $X\cos(\theta)+jX\sin(\theta)$ and back)
  - Impedance of R, L, and C
  - Finding real and complex currents and voltages using phasors
  - Drawing bode diagrams
  - Magnitude and phase calculations
  - Low-pass filter circuit and characteristics
  - High-pass filter circuit and characteristics
• **Chapter 4: Characteristics of Periodic Waveforms**
  o Power and energy of a circuit element
  o Fourier series representation of a signal
  o RMS and EFF voltage (similarly $V_{AC}$ and $V_{DC}$)
  o Power and energy of a sinusoidal wave
  o Parseval’s Relation

• **Chapter 5: Circuits Containing Inductance**
  o Output impedance of a function generator
  o Terminal properties of inductors
  o Series resonance
  o Parallel resonance
  o Mutual inductance