

Topics to Review: The following topics are fair game on the first exam. Remember, you are allowed to bring a review sheet to the exam that fills two sides of an 8.5x11" piece of paper. Remember to also bring a calculator.

- Transducers
 - Resistive Transducers (e.g., strain gages, thermistors)
 - Differential Capacitors
 - LVDTs
 - Thermocouples
- Detection Circuits
 - Wheatstone Bridge
 - Reactance Bridge
 - RLC Divider
 - What affects sensitivity, error reduction, etc.
- Amplifiers
 - Ideal Op Amp Equiv. Model
 - Buffers
 - Inverting, Non-inverting
 - Summing
 - Differential, Instrumentation
- Passive and Active Filters
 - LPF, HPF, Bandpass, Bandstop
 - Identify and derive transfer functions and cutoff/resonant frequencies for first- and second-order filters
 - Bode plots (sketch and interpret)
 - Design "simple" filters
 - Integrators and differentiators
- Comparators (with hysteresis)
- Diodes
 - Half/Full-Wave Rectifiers
 - Clippers/Limiters
 - Clamps
- Relays and Transistors (to the level covered in lab and problem sets; used for isolation, switching)
- Miscellaneous
 - Know the difference between zero-order, first-order and second-order systems
 - Input/output impedance

Types of Questions to Expect

- Evaluate a circuit
 - Solve for voltages and currents
 - Sketch waveforms of outputs or mid-circuit nodes
 - Modify a circuit to change its behavior
 - Early errors will not hose you, but you must show all of your work!
- Design a circuit
 - Block diagrams are your best friend!
 - Always state your assumptions
 - More than one way to do it
- Explain / define something
- Lab-based questions (not minutiae)
- Things **NOT** on the exam:
 - There will be no “plug-and-chug” problems; think homework problems with the ante upped a bit.
 - There will be no LabVIEW questions.
 - SNR / Noise Sources
 - Averagers
 - Correlation
 - Digital