

Pre-labs, to hand in with your lab partner

- Identify the theme given for each week's laboratory exploration and experiments.
- Identify and state your learning objectives, from the *Questions of Understanding* that I suggest, or your own.
- Determine what you need to do to make progress on your objective(s) and Question(s).
 - Design your lab experiments – working together, with me, with master tutors...
 - Include circuits you will build and what measurements you will make
 - ... and explain why you expect that building and analyzing these circuits will deepen your understanding.

While in lab:

- Implement your pre-lab plan, being flexible to change/update your pre-lab plan as needed, and record results from the lab
- Take notes and frame new questions on your progress in learning and understanding

Assessment of Lab Memos / Lab experiments. I will look for:

- Objective: stating your learning objective(s)
 - Can be a combination of course and personal objectives.
 - I can only assess these if you make your objectives clear throughout the semester, and state them in your weekly lab memos.
- Progress you make each week → Evidence of learning, including framing questions as well as making progress on them
- Concise discussion of what you discovered and progress you have made
 - Explanation of and results from the laboratory experiments in terms of how they advance your learning
 - Completeness (you did significant work each week)
- One concise and elegant summary statement of *what you learned* and *how your understanding is improving, has improved...*

Questions of Understanding

- 1) How are voltage and current inter-related?
 - What do I understand about the theoretical and practical connections between voltage and current?
- 2) What is voltage?
 - What do I understand about the concept of voltage?
- 3) How do conservation laws apply to circuit theory?
 - What is my understanding of how conservation laws are used in circuit analysis?
- 4) What does "equivalent" mean for electrical circuits?
 - What is my understanding of how "equivalence" is used to design and analyze circuits?

Deepening your understanding, by asking, for example:

- What am I unsure about for the concept of _____?
- What is my theory to explain _____?
- Can I design circuits and analyze their behavior to test my theory?
- How can I experiment with this theory? law? concept?

Weekly EGR 220 Lab Themes (subject to change, so always double-check the course webpage)

- Lab 2, Feb 5: Explore equivalent resistance
- Lab 3, Feb 12: Explore circuit theorems (chapter 4)
- Feb 19: -- Exam 1 --
- Lab 4, Feb 26: Explore Thevenin equivalent circuits
- Lab 5, March 4: Explore the concept of time constant
- Lab 6, March 11: Explore the step response of an RC circuit
- March 18: -- Spring Break --
- March 25: Practice and review for exam 2
- April 1: -- Exam 2 --
- Lab 7, April 8: Explore 2nd order circuit step response
- Lab 8, April 15: Explore 1st order circuit filters
- Lab 9, April 22: Explore 2nd order circuit filters
- Lab 10, April 29: Explore op amps

Save all prelabs and labs to hand in (re-submit) as a final lab portfolio, at the end of the semester.