

**EGR 220: Engineering Circuit Theory Lab**  
**Lab 3: Explore circuit theorems**

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**Complete Lab 1: Introduction to the oscilloscope and function generator this week or next.**

### **Lab 3 Theme**

The purpose of this lab is for you, *with your lab partner*, to design and carry out a few simple experiments to explore and verify the circuit theorems in chapter 4: Linearity & Superposition. You also need to select one (or more) Question of Understanding, and explicitly state your objective to deepen your understanding of the concept(s) in your Question.

### Circuits to Explore

Design circuits that will allow you to verify the theory of linearity (§4.2) and the theory of superposition (§4.3). Use these explorations to deepen and improve your understanding of circuit theory concepts, especially those discussed in our Questions of Understanding.

You could look through sections 4.2 and 4.3 in the text, as well as the end-of-chapter problems, to get ideas for simple circuits that will be useful in verifying these theories.

- 1) Design a circuit for each theory. Design in this situation means that you determine:
  - The source(s) and their numerical values (use voltage sources only),
  - The resistors and their values (use k $\Omega$  or M $\Omega$  resistors, nothing smaller), and
  - How they are connected – series and or parallel arrangements.
- 2) List the steps you will perform to verify each theory, with a brief statement explaining why.
- 3) State your expected measurements and/or results.