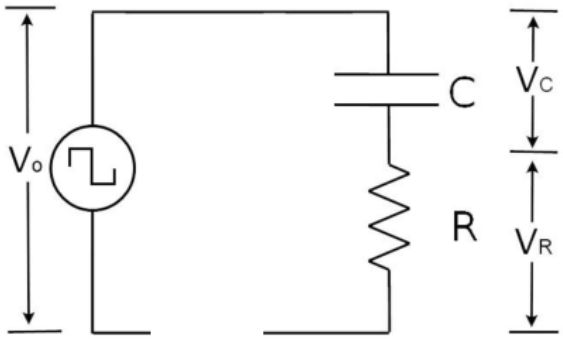
Manual to Lab 8: PHY2048C

Florida State University

Circuits III



About labs in this class

The labs in this class will have general instructions, and many things need to be figured out by the students. I will be answering any specific questions the students may have without completely giving away the key to the puzzle. **Answer the questions and record your measurements in your lab notebook and submit the notebook at the end of the activity.**

About this lab

In this lab, you are provided with tools to make an RC Circuit and an LRC Circuit. Troubleshooting this experiment is part of the lab.

Activity 1: Make a charging RC circuit by placing a resistor and a capacitor in series with a battery and a switch.

Activity 2: Measure the characteristic capacitor charge time using the oscilloscope (the Universal Interface). Sketch a plot of current over time.

Question 1: What is the characteristic time of the circuit? Is it $\tau = RC$?

Activity 3: While the capacitor is still charged, make an LRC circuit without a battery (add an inductor in series with a resistor and a charged capacitor), you must be quick to keep the capacitor charged since it discharges with the air.

Question 2: How long until the circuit damps the charge 1/e of the initial charge? Is this time consistent with the theoretical value (Ch 14.6)

Activity 4: Now connect the LCR to the Universal Interface's power supply and output an AC signal that resonates with the circuit?

Question 3: What is the maximum current you can get through the resistor? Is this in line with the theoretical estimate? (Ch 15.3).

Activity 5: Pass a constant current thought to an inductor (do not short it), then open the circuit abruptly and generate a kickback signal. Show me this signal (it will be a small peak).