

Design Studio – Week 5

Today you will:

- Discuss the process of designing your RLC circuit
- Build and test a prototype of your circuit design
- Observe additional ways to use and test a filter circuit

Assignments:

- Exercise worksheet for RLC circuit prototype and test
- Project 1 technical report (continued from last week)

Project 1 Review



Improve

Last week you designed, built, and tested an RLC filter circuit.

Did it work, i.e. did it meet the requirements?

Was it an improvement over the RC filter?

What was difficult about the design process?

What would you do differently next time?

Engineering Tools – Function Generator

When developing your prototype, you'll have to use a source that can output a sine wave – a function generator.



The other settings aren't needed (turn them off).

Turn on the device power to start.

Adjust and measure the output amplitude.

Engineering Tools – Multimeters

AC circuit measurements can be done with the multimeter, measuring current and frequency.

The AC voltage measurement here will be reported in “volts RMS”.

Remember for sines:
 $V_{rms} = \text{magnitude} / \sqrt{2}$

Turn the dial here to measure voltage.


Press the SELECT button to toggle between DC and AC measurements.



Turn the dial here to measure frequency.

In most cases, you can check the accuracy of the frequency reading once at the beginning of your test.

Project 1 Prototype and Test



Create

We're now going to build a breadboard prototype and test it.

One team at a time can come to the front and get the resistors, inductors, and capacitors they need for their design.

Follow along with the exercise worksheet to test your circuit once it has been built.

Your instructor is here to help answer guiding questions and troubleshoot any problems that your team identifies.

When you finish your measurements, don't disconnect your circuit and put away the components just yet.