

Course name	ECE 20700 Electronic Measurement Techniques
Credit and contact hours	(1 cr.) Lab 3
Course coordinator's name	Steven Rovnyak
Textbook	Lab manual available in Canvas
Course information	<p>ECE 20700 Electronic Measurement Techniques (1 cr.) C: ECE 20100. Lab 3. Experimental exercises in the use of laboratory instruments. Voltage, current, impedance, frequency, and waveform measurements. Frequency and transient response. Use of operational amplifiers in instrumentation systems.</p> <p>Prerequisites/ Co-Requisite C: ECE 20100</p> <p>Required, Elective, or Selected Elective: EE Required, CE Required</p>
Goals for the course	<p>Upon successful completion of the course, students should be able to</p> <ol style="list-style-type: none"> 1. Perform measurements of voltages and currents in electric circuits using basic laboratory measurement equipment, such as oscilloscopes, function generators, and digital multi-meters. 2. Measure the phase difference between two sinusoidal signals using the oscilloscope. [6] 3. Make measurements to verify Kirchhoff's Current Law and Kirchhoff's Voltage Law in a resistive circuit. [6] 4. Assemble and test basic op-amp circuits such as inverting and summing amplifiers. [6] 5. Verify the predicted step response of R-L, R-C, and R-L-C circuits. [1,6] 6. Draw a phasor diagram for voltages in an R-L-C circuit with a sinusoidal source. 7. Make a diagram of voltage magnitude versus frequency on a log-log scale for an AC circuit. [1] 8. Conduct an experiment using a function generator, a resistor and a voltage meter to roughly estimate the value of a capacitor or an inductor. [1,6]
List of topics to be covered	<ol style="list-style-type: none"> 1. Ohm's Law 2. Kirchhoff's Laws and equivalent resistance 3. Voltage/current dividers and meter loading 4. Nodal analysis 5. Mesh analysis 6. Equivalent circuits and maximum power 7. Periodic signals and operational amplifiers 8. Applications of operational amplifiers 9. First order transient circuits

	10. Second order transient circuits 11. AC phasor analysis 12. First order AC circuits 13. Second order AC circuits
Syllabi approved by	Steven Rovnyak
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