

Electrical Circuits: ENGN/PHYS 207 Fall 2018
[Last updated: 05 Dec 2018]

Date	Topic	Text Reading
06-Sep	“Hellos!”, syllabus review, and circuits applications	
07-Sep	Voltage and Current	1.2.1 – 1.2.3
10-Sep	Ohm’s Law	1.2.4
12-Sep	Kirchoff’s Laws, Series & parallel equivalent resistors; voltage dividers	1.3, 1.6.1
13-Sep	LAB 1: Basic DC Circuits: goniometer	1.3.3
14-Sep	Recap Lab 1 concepts; Scientific Writing Examples Discussion	
17-Sep	Workshop: Drawing schematics in software; Matlab graphing	
19-Sep	Nodal voltage and Ground; analyze Wheatstone Bridge	
20-Sep	LAB 2: Wheatstone Bridge: monitoring motion with pencil-drawn resistors	
21-Sep	Power dissipation; wires as continuous resistors	1.4
24-Sep	Phasor Math; Impedance	2.1 – 2.2
26-Sep	More Phasor Math; Capacitors and Impedance Z_c	1.2.6, 2.6, 3.2.1
27-Sep	Review Written Reports: individual meetings	
28-Sep	Low pass filter; Transfer function $H(\omega)$; audio applications	2.4 – 2.5
01-Oct	LPF: magnitude and phase response, cutoff frequency f_o Midterm exam #1 OUT. Due 5pm Sunday Oct 07	
03-Oct	High Pass Filter;	3.3.1; 3.7
04-Oct	LAB 3: RC filters: audio and biomedical applications, filter cascade design rules	
05-Oct	Band-pass filter; decibel gain $G(\omega)$	3.2.2-3, 3.3.2
09-Oct	Band pass filter workshop/in-class problems	2.1, 2.8
10-Oct	Band pass filter workshop/in-class problems part II	
11-Oct	No lab: Reading Days	
12-Oct	No class: Reading Days	
15-Oct	Intro to Op-amps; Golden Rules	6.3
17-Oct	Op-amp configs: inverting, non-inverting	6.3.2, 6.3.3
18-Oct	LAB 4: Op-amps: audio applications	6.5.2

Date	Topic	Text Reading
19-Oct	Difference Amp and Instrumentation Amp	6.3.4
22-Oct	Instrumentation Amp: Part 2	
24-Oct	Op-amp linear model: where the golden rules come from	6.2
25-Oct	LAB 5: Instrumentation Amp and Arduino for Vibrational Sensor Learn to Solder!	
26-Oct	Patching conceptual gaps – open Q&A	
29-Oct	Active Filters – LPF and HPF	6.5.2
31-Oct	Active Filters – BPF	
01-Nov	LAB 6. Biomedical Sensing: EMG circuit	
02-Nov	Design considerations for EMG circuit	
05-Nov	Op-amp input-output limitations with single supply power (+5V/gnd)	6.4.4
07-Nov	Diode curve and practical LED circuits	4.6
08-Nov	Continue Lab 6 (finish EMG proof of concept)	
09-Nov	Semiconductor physics – pn junction	4.4
12-Nov	Diodes/PN junction review (song/poem lyrics)	4.6.1
14-Nov	Rectifiers; Peak detectors; RC Smoothing: Hardware vs. Software solutions	4.6.1
15-Nov	Finish Lab 6 (Smoothing and Arduino servo motor control)	
16-Nov	Photodiode; Photovoltaics	website
Nov 19 – 23	<i>No class: Happy Thanksgiving--enjoy time with your family and friends!</i>	
26-Nov	Transistors: BJT as digital switch	7.2
28-Nov	Optoelectronics; Final Design Project OUT. Begin design work.	
29-Nov	No formal lab. Work on Final Design Project	
30-Nov	Inductors and Z _L	1.2.7
03-Dec	RLC resonance; Transmission Line Reflections: Impedance matching	3.5
05-Dec	RFID technology and Transformers. Final Exam Out. Due Dec 12 noon.	Website
06-Dec	No lab. Work on Final Design Project	
07-Dec	Electrical Safety at Home	website
Dec 08 – 14	Course survey/feedback. Doughnuts! FINALS WEEK: Final Design Project Due Dec 14, 9am.	

