

ECE 2040
 Course Outline
 Spring Semester 2001
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No.	Date	Topic	Notes	Text
1	1/5	Introduction; Voltage drops, currents, and power; Ideal resistors, inductors, and capacitors	1.1, 1.2	1.3—1.6, 2.5, 7.3, 7.6
2	1/8	Independent sources; Kirchoff's current law	1.3, 1.4.1	2.6, 3.3
3	1/10	Kirchoff's voltage law; elements in series and parallel	1.4.2, 1.4.3	3.3
4	1/12	Finding equilibrium solutions; dependent sources;	1.4.3, 1.4.4, 1.5	2.8
	1/15	Holiday (no class)		
5	1/17	Basic networks; writing sufficient KCL and KVL equations	2.1.1, 2.1.2, 2.1.3	
6	1/19	Exhaustive and Simplified Exhaustive Methods for circuit analysis	2.1.4	
7	1/22	Using Matlab to solve linear equations	2.2.1—2.2.4	
8	1/24	Superposition of sources; conservation of power	2.2.5, 2.5	5.4
9	1/26	Node method	2.3	4.3, 4.4, 4.5
	1/29	Quiz #1 (Lectures 1—6)		
10	1/31	Mesh Method	2.4	4.6, 4.7, 4.8
11	2/2	Two-terminal networks; determining v-l relations	3.1	

12	2/5	Resistors in series and parallel; voltage and current dividers; delta-wye transformations	3.2.1, 3.2.2	3.4, 3.5 3.6, 3.7 17.4
13	2/7	Thevenin and Norton equivalent circuits	3.2.3, 3.2.4 3.2.5	5.5, 5.6
14	2/9	Source transformations; Maximum power transfer		5.3, 5.7
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15	2/12	Operational amplifiers	4.1, 4.2	6.4, 6.5
16	2/14	Examples of operational amplifiers	4.3	6.6
17	2/16	Quick review of complex numbers; Laplace transforms	5.2, 5.3, 5.4	14.3
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	2/19	Quiz #2 (Lectures 6—14)		
18	2/21	Computing inverse Laplace transforms Partial fraction expansions	5.5.1	14.5, 14.12
19	2/23	Inverse Laplace transforms with singularity functions and repeated roots	5.5.2, 5.5.3	14.4
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20	2/26	First-order reactive circuits; differential equations and initial conditions	6.1	8.3, 8.7
21	2/28	Circuits in the Laplace domain;	6.2	14.6
22	3/2	Examples of Laplace domain circuit analysis; initial and final value theorems	6.2	14.7
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23	3/12	Inspection methods for first-order circuits with step inputs	6.3	8.3, 8.6
24	3/14	Impedances and admittances; Thevenin and Norton equivalents in the Laplace domain	6.4	14.8, 14.9
25	3/16	Node and mesh methods in the Laplace domain	6.5	
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26	3/19	Input/output viewpoint; system functions; poles and zeros; forces and transient responses	7.1	14.11
27	3/21	Linearity and time-invariance; impulse responses of circuits	7.2, 7.3	14.10

	3/23	Quiz #3 (Lectures 15—25)		
28	3/26	Review of sinusoids; sinusoidal steady state; example of sinusoidal response	8.1	10.3, 10.4 10.5
29	3/28	Responses to real sinusoids; relation to complex exponential time function response	8.2.1	10.6, 10.7 10.8
30	3/30	Circuit analysis in the complex amplitude domain	8.2.2	10.9
31	4/2	Node and mesh equations with complex amplitudes	8.3.3, 8.3.4	10.10
32	4/4	Power and energy with sinusoidal inputs; Maximum power transfer—reactive case		11.3, 11.8
33	4/6	System functions and frequency responses	9.2.2, 9.3	16.6
34	4/9	Frequency responses of first-order circuits	9.3.1	
35	4/11	Frequency responses of second-order circuits; Resonance; Q factor	9.3.2	
36	4/13	Bode plots of 1 st and 2 nd order circuits	9.4.1, 9.4.2	13.4
	4/16	Quiz #4 (Lectures 26—33)		
37	4/18	Compound Bode plots	9.4.3	
38	4/20	Frequency scaling; impedance scaling; filter transformations		16.3, 16.4
39	4/23	Classical approximations to ideal filter types; constructing filters with second-order sections		16.5
40	4/25	Catch-up		
41	4/27	Course summary; key points to remember		
	5/1	Final Exam (Period 6)	inclusive	