Approximate conversion between *Circuits Analysis and Design* (Ulaby, et al) and *Fundamentals of Electric Circuit Analysis* (Alexander and Sadiku).

Circuit Analysis and Design **Ulaby, Maharbiz, Furse**	*Fundamentals of Electric Circuits* **Alexander and Sadiku**
2020 Textbook	Approximate chapter in Alexander and Sadiku
1 Circuit Terminology	**1 Basic Concepts**
1-1 Historical Timeline	1.1 Introduction, Applications
1-2 Units, Dimensions, Notation	1.2 Systems of Units
1-3 Circuit Representation	2.3 Nodes, Branches and Loops
1-4 Electric Charge and Current	1.3 Charge and Current
1-5 Voltage and Power	1.4 Voltage 1.5 Power and Energy
1-6 Circuit Elements	1.6 Circuit Elements
2 Resistive Circuits	**2 Basic Laws**
2-1 Ohm's Law	2.2 Ohm's Law
2-2 Kirchoff's Law	2.4 Kirchoff's Laws
2-3 Equivalent Circuits	2.5 Series Resistors and Voltage Division 2.6 Parallel Resistors and Current Division
2-4 Wye-Delta	2.7 Wye-Delta Transformations
3 Analysis Techniques	**3 Methods of Analysis** **4 Circuit Theorems**
3-1 Linear Circuits	
3-2 Node-Voltage Method	3.2 Nodal Analysis 3.3 Nodal Analysis with Voltage Sources
3-3 Mesh Current Method	3.4 Mesh Analysis 3.5 Mesh Analysis with Current Sources
3-4 By Inspection Methods	3.6 Nodal and Mesh Analysis by Inspection
3-5 Linear Circuits and Source Superposition	4.2 Linearity Property 4.3 Superposition
3-6 Thévenin and Norton Equivalent Circuits	4.4 Source Transformation 4.5 Thévenin's Theorem 4.6 Norton's Theorem 4.7 Derivations of Thévenin's and Norton's
3-7 Comparison of Analysis Methods	
3-8 Maximum Power Transfer	4.8 Maximum Power Transfer
4 Operational Amplifiers	**5 Operational Amplifiers**
4-1 Op-Amp Characteristics	5.2 Operational Amplifiers
4-2 Negative Feedback	5.2 Operational Amplifiers
4-3 Ideal Op-Amp Model	5.3 Ideal Op Amp
4-4 Inverting Amplifier	5.4 Inverting Amplifier
4-5 Inverting Summing Amplifier	5.6 Summing Amplifier
4-6 Difference Amplifier	5.5 Noninverting Amplifier 5.7 Difference Amplifier
4-7 Voltage Follower/Buffer	5.5 Noninverting Amplifier
4-8 Op-Amp Signal Processing Circuits	5.8 Cascading OpAmp Circuits

5 RC and RL First Order Circuits	6 Capacitors and Inductors 7 First-Order Circuits
5-1 Nonperiodic Waveforms	
5-2 Capacitors	6.2 Capacitors 6.3 Series and Parallel Capacitors
5-3 Inductors	6.4 Inductors 6.5 Series and Parallel Capacitors
5-4 Response of RC Circuit	7.2 Source-free RC Circuit 7.5 Step Response of RC Circuit
5-5 Response of RL Circuit	7.3 Source-free RL Circuit 7.5 Step Response of RC Circuit
5-6 RC OpAmp Circuits	6.6 Applications (Integrator, Differentiator, Analog Computer) 7.7 First-order OpAmp Circuits
	7.4 Singularity Functions
6 RLC Circuits	8 Second Order Circuits
6-1 Initial and Final Conditions	8.2 Finding Initial and Final Values
6-2 Introducing the Series RLC Circuit	-
6-3 Series RLC Overdamped Response	8.3 Source-Free Series RLC Circuit 8.5 Step Response of a Parallel RCL Circuit
6-4 Series RLC Critically Damped Response	8.3 Source-Free Series RLC Circuit 8.5 Step Response of a Parallel RCL Circuit
6-5 Series RLC Underdamped Response	8.3 Source-Free Series RLC Circuit 8.5 Step Response of a Parallel RCL Circuit
6-6 Summary of the Series RLC Response	8.3 Source-Free Series RLC Circuit 8.5 Step Response of a Parallel RCL Circuit
6-7 The Parallel RLC Circuit	8.4 Source-Free Parallel RLC Circuit 8.6 Step Response of a Parallel RLC Circuit
6-8 General Solution for Any Second-Order	8.7 General Second-Order Circuit
	8.8 Second Order OpAmp Circuits
7 ac Analysis	9 Sinusoids and Phasors 10 Sinusoidal Steady State Analysis
7-1 Sinusoidal Signals	9.2 Sinusoids
7-2 Review of Complex Algebra	9.2 Sinudoids
7-3 Phasor Domain	9.3 Phasors
7-4 Phasors Domain Analysis	9.3 Phasors
7-5 Impedance Transformations	9.4 Phasor Relationships for Circuit Elements
7-6 Equivalent Circuits	9.5 Impedance and Admittance 9.7 Impedance Combinations
7-7 Phasor Diagrams	9.4 Phasor Relationships for Circuit Elements
7-8 Phase-Shift Circuits	9.6 Kirchoff's Law in the Frequency Domain
7-9 Phasor Domain Analysis Circuits	9.6 Kirchoff's Law in the Frequency Domain 10.2 Nodal Analysis 10.3 Mesh Analysis 10.4 Superposition Theorem 10.5 Source Transformation 10.6 Thevenin. And Norton Equivalent
7-10 ac OpAmp Ciruits	10.7 OpAmp AC Circuits
7-11 OpAmp Phase Shifter	9.8.1 Phase Shifters

8 ac Power	11 AC Power Analysis
8-1 Periodic Waveform	11.2 Instantaneous and Average Power
8-2 Average Power	11.2 Instantaneous and Average Power 11.3 Maximum Average Power Transfer 11.4 Effective or RMS Value
8-3 Complex Power	11.5 Apparent Power and Power Factor 11.6 Complex Power
8-4 The Power Factor	11.5 Apparent Power and Power Factor 11.6 Complex Power
8-5 Maximum Power	11.3 Maximum Average Power Transfer
-	11.7 Conservation of AC Power 11.8 Power Factor Correction