WASHINGTON STATE UNIVERSITY
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School of Engineering and Computer Science

ECE 260: Circuit Modeling and Analysis I
Master Syllabus

Catalog Data:	**ECE 260: Circuit Modeling and Analysis I**; 4 credits (3-3) Circuit modeling, analysis, component models, theory and simulation tools; application of network theory to solve linear and non-linear circuits under static and dynamic operation. Typically offered in Spring.
Class Schedule:	3 lecture hours per week, for one semester.
Laboratory Schedule:	One 3-hour lab session per week, for one semester.
Prerequisites by Course:	ECE 101; MATH 315 or c//
Prerequisites by Topic:	1. Calculus, linear algebra, differential equations, complex variables 2. Understanding of voltage, current, charge concepts
Typical Texts:	Alexander and Sadiku, *Fundamentals of Electric Circuits, 5/e*, McGraw-Hill, 2013, ISBN 978-0-07-338057-5 Antoch, *Experiments with Electric Circuit*s, ZAP Studio LLC, 2010, ISBN 978-1-935422-11-2
Course Coordinator:	Dr. John Lynch
Course Objectives:	Students will: 1. Apply the principles of lumped circuit models to electronic circuits. 2. Analyze the DC behavior of resistive circuits using superposition, Thévenin's theorem and Norton's theorem. 3. Analyze the transient response of circuits including capacitive and inductive components. 4. Use circuit simulation tools to predict the behavior and response of circuits constructed in the laboratory.
Topics Covered:	1. Current, voltage and power 2. Types of circuit elements 3. Ohm's and Kirkoff's laws 4. Node and mesh analysis 5. Source transformations 6. Linearity and superposition 7. Norton and Thévenin theorems 8. Inductance and capacitance 9. RL and RC circuits 10. Circuit simulation 11. Unit step forcing function 12. RLC circuits 13. Sinusoidal analysis and phasors 14. Average and RMS power 15. Three-phase circuits
Lab Experiments and Activities:	Students will perform experiments to explore the topics listed above on physical circuits and/or circuit simulation software such as PSpice.

Course Outcomes:	Students will be able to:			
	Assessment for Student Outcomes	1-d. Apply mathematics, scientific and/or engineering principles toward solving circuit problems. 3-a. Produce lab reports using appropriate formats and grammar with discipline-specific conventions. 6-c. Conduct analysis and interpretation of data from circuit experiments. 6-d. Draw conclusions by evaluating experimental results with respect to circuit theory.		
	Other	1-a. Demonstrate knowledge of fundamental circuit principles. 1-c. Use appropriate circuit models to formulate solutions. 6-a. Identify constraints, assumptions, and models for circuit experiments. 6-b. Use appropriate equipment and techniques for circuit experiments.		
Relationship of Course to Program:		Meets: Educational Objectives 1, 2, 4 Student Outcomes 1, 3		
Prepared by:		Dr. John Lynch	Date:	Revised 03/2018; 3/21/18 (mb) Rev, 5-23-19 JL