

# JEE2300 INTRODUCTION TO ELECTRICAL NETWORKS

## SCHEDULE – SPRING 2011

Lectures: Mon, Wed 5:30pm to 7:00pm in Sever 102  
 Course Instructor: Darko Ivanovich, Urbauer 211, 314-537-4124 (C), darkoivanovich@msn.com  
 Course Graders/TAs: Marc T. Harris (mth3md@mail.umsi.edu)  
 Text: Nilsson, Riedel, Electric Circuits, 9th Edition, 2010

### TOPICS

Session 1		1/19	<b>Introduction:</b> (Chapter 1) El. Engineering: An Overview, SI Units, Circuit Analysis: An Overview, Voltage and Current, The Ideal Basic Circuit Element, Power and Energy, Chapter 1 Practical perspective
Session 2	H1	1/24	<b>Circuit Elements:</b> (Chapter 2) V&I sources, Resistance (Ohm's Law), Circuit Model Definition.
Session 3		1/26	Kirchhoff's Law's, Analysis of a Circuit Containing Dependent Sources, Practical Problems
Session 4	H2	1/31	<b>Resistive Circuits:</b> (Chapter 3) Series, Parallel, Voltage Divider and Current Divider
Session 5		2/2	Voltage and current division, Measuring Voltage and Current, Measuring Resistance – The Wheatstone bridge, Delta-to-Wye/Pi-to-Tee, Practical Problems
Session 6	H3	2/7	<b>Circuit Analysis:</b> (Chapter 4) Terminology, Node-Voltage, <b>PSpice Tutorial 1</b>
Session 7		2/9	Node-Voltage and Dependent Sources, Node-Voltage Method: Some Spec Cases, Mesh- Current
Session 8	H4	2/14	Mesh-Current and Dependent Sources, Mesh-Current Method: Some Special Cases, Node-Voltage Vs Mesh-Current
Session 9		2/16	Source Transformation, Thevenin and Norton Equivalents,
Session 10	H5	2/21	More on Deriving a Thevenin Equivalent, Max Power Transfer, Superposition, Practical Problems
Session 11		2/23	<b>Inductance, Capacitance:</b> (Chapter 6) L, C, Series-Parallel Combination of L and C
Session 12		2/28	Mutual Inductance, A Closer Look at Mutual Inductance, Practical Problems, Test#1 Review
Session 13	H6	3/2	<b>Test #1 (Chapters 1 thru 4)</b>
Session 14		3/7	<b>First-Order RL&amp;RC:</b> (Chapter 7) Natural Response of RL, RC Circuits
Session 15		3/9	Step Response of RL, RC Circuits, General Solution, Problems
Session 16	H7	3/21	Sequential Switching, Unbounded Response, Practical Problems
Session 17		3/23	<b>Natural &amp; Step of RLC:</b> (Chapter 8) Natural response of Parallel RLC circuit, The Forms of Natural response of Parallel RLC circuit
Session 18	H8	3/28	Step response of Parallel RLC circuit, Both responses of Serial RLC, Practical Problems
Session 19		3/30	<b>Sinusoidal Steady-State Analysis:</b> (Chapter 9) Source, Response, Phasor, Passive Circuit Elements in freq. domain
Session 20	H9	4/4	Kirchhoff's Law in freq. domain, Simplifications, Source Transformation and Thevenin- Norton, Problems
Session 21		4/6	Node-Voltage, Mesh-Current, Transformer, Ideal Transformer, Phasor Diagrams, Problems
Session 22		4/11	<b>Sinusoidal Steady-State Power:</b> (Chapter 10) Instantaneous, Average, Reactive, RMS, Test#2 Review
Session 23	H10	4/13	Complex Power, Power Calculations, Max. Transfer, Practical Problems
Session 24		4/18	<b>Test#2 (Chapters 6 thru 9)</b>
Session 25		4/20	<b>Operation Amplifier:</b> (Chapter 5) OP Amp Terminals, Inverting
Session 26	H11	4/25	Summing, Non-inverting, Difference Operation Amplifier
Session 27		4/27	More Realistic Model for the Operation Amplifier, <b>PSpice Tutorial 2</b>
Session 28		5/2	Final Exam Review
Session 29		5/??	<b>Final Exam</b> (Comprehensive exam)

**Grading Policy:**  
 Homework: 20%  
 Test #1: 25%  
 Test #2: 25%  
 Final Exam: 30%

**Homework:** Homework will typically be assigned on Monday or Wednesday in class and will be posted on the class website. Homework will be due the following Monday or Wednesday in the homework bin marked JEE2300 located outside the UMSL-WUSTL Joint Engineering Programs Office, Urbauer 211. The bin will be emptied by 5:30 PM the same day. Any late homework will bear no points, unless excused in advance by course instructor. Partial credit to homework solutions will be awarded valuing method(s) used and concept(s) applied.

**Computer Usage:** Some homework exercises might require the use of PSpice as a computer-aided design tool. PSpice is available at the Center for Engineering Computing (CEC). PSpice Tutorial sessions will be organized twice during the semester, as indicated above.

**Website:** All class info, class scores, and class tutorials will be posted on the course website.