

Montgomery County Community College
EGR 214
Linear Electrical Systems II
4-3-3

COURSE DESCRIPTION:

This course introduces the concepts of linear systems theory as applied to electrical networks, AC steady state analysis, frequency response, two-port models, Fourier series, and Laplace transforms. This course is subject to a course fee. Refer to <http://mc3.edu/adm-fin-aid/paying/tuition/course-fees> for current rates.

REQUISITES:

Previous Course Requirements

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
<p>3. Examine the characteristics of a balanced, three-phase circuit, including basic wye and delta three-phase connections, in order to calculate voltage, current, and complex power in the same.</p>	<p>Lecture Problem-Solving Assignments Design of Experiments</p>	<p>Section Examination Design of Experiments Review</p>
<p>4. Examine the variable-</p>		

- d. Effective or Rms Values
 - e. The Power Factor
 - f. Complex Power
 - g. Power Factor Correction
 - h. Single-Phase Three-Wire Circuits
 - i. Safety Considerations
 - j. Application Examples
 - k. Design Applications
- 2. Magnetically Coupled Networks**
- a. Mutual Inductance
 - b. Energy Analysis
 - c. The Ideal Transformer
 - d. Safety Considerations
 - e. Application Examples
 - f. Design Applications
- 3. Polyphase Circuits**
- a. Three-Phase Circuits
 - b. Three-Phase Connections
 - c. Source/Load Connections
 - d. Power Relations
 - e. Power Factor Correction
 - f. Application Examples
 - g. Design Examples
- 4. Variable Frequency Network Performance**
- a. Variable Frequency Response Analysis
 - b. Sinusoidal Frequency Analysis
 - c. Resonant Circuits
 - d. Scaling
 - e. Filter Networks
 - f. Application Examples
 - g. Design Examples
- 5. The Laplace Transform**
- a. Definition
 - b. Two Important Singularity Functions
 - c. Transform Pairs
 - d. Properties of the Laplace Transform

- f. Steady-State Response
 - g. Application Examples
 - h. Design Examples
- 7. Fourier Analysis Techniques**
- a. Fourier Series
 - b. Fourier Transforms
 - c. Application Examples
 - d. Design Examples

LEARNING MATERIALS:

Present selected text:

Irwin, J.D. and Nelms, R.M. (2011). *Basic Engineering Circuit Analysis* (10th ed.). Wiley.

Simulation software – Multisim

Other learning materials may be required and made available directly to the student and/or via the College's Libraries and/or course management system.

COURSE APPROVAL:

Prepared by: Dr. David Brookstein, Dean for STEM

Date: 3/9/2013

VPAA/Provost or designee Compliance Verification:

Victoria L. Bastecki-Perez, Ed.D.

Date: 4/16/2013

Revised by: Gayathri Moorthy, Ph.D.