

# COLLEGEWIDE COURSE OUTLINE OF RECORD

## EECT 211, AC CIRCUIT ANALYSIS

COURSE TITLE: AC Circuit Analysis

COURSE NUMBER: EECT 211

PREREQUISITES: EECT 121 Electronics Circuit Analysis and MATH 137 Trigonometry with Analytic Geometry.

SCHOOL: Technology

PROGRAM: Electronics and Computer Technology

CREDIT HOURS: 4

CONTACT HOURS: Lecture: 3 Lab: 2

DATE OF LAST REVISION: Spring, 2014

EFFECTIVE DATE OF THIS REVISION: Fall, 2014

COURSE DESCRIPTION: AC circuits, including the  $j$  operator, phasors, reactance, and impedance are studied. Circuit laws, network theorems, and the fundamental concepts of Fourier analysis are applied and used in the study of topics such as passive filters, IC filters, amplifiers, resonant circuits, single phase and three phase circuits. Computer aided analysis of circuits is used.

MAJOR COURSE LEARNING OBJECTIVES: Upon successful completion of this course the student will be expected to:

1. Use complex numbers, the  $j$  operator, and phasors to analyze AC electrical circuits.
2. Analyze series, parallel, and series-parallel passive and active AC circuits.
3. Analyze multi-loop, multi-source AC circuits using mesh analysis.
4. Calculate parameters associated with an amplifier's frequency response, gain bandwidth and slew rate.
5. Derive frequency response transfer functions for simple passive and active networks.
6. Apply Fourier analysis techniques to calculate the response of passive and active networks to non-sinusoidal signals.
7. Analyze and design series and parallel resonant circuits.
8. Compute real, reactive, and apparent power, and the power factor.
9. Analyze three-phase Y and delta networks.
10. Evaluate the performance of each of the circuits described above, using appropriate standard laboratory measurement procedures, and simulations.

COURSE CONTENT: Topical areas of study include –

Sinusoidal waveforms

Complex numbers & phasors

Series circuits

Parallel circuits

Impedance combination

Mesh analysis

Introduction to ac power

Power factor and correction

Filter terminology  
Low and high pass filters  
Op amps frequency response

Introduction to three phase systems  
Y connected loads  
Delta connected loads

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