ITT Technical Institute

ET446T

Advanced Circuit Analysis II

Onsite Course

SYLLABUS

Credit hours: 4

Contact/Instructional hours: 60 (36 Theory Hours, 24 Lab Hours)

Prerequisite(s) and/or Corequisite(s):

Prerequisites: ET445T Advanced Circuit Analysis I

Course Description:

A continuation of transform circuit analysis, including transfer functions and Fourier techniques. Laboratory includes applications to support the analysis of analog circuits.

STUDENT SYLLABUS: ADVANCED CIRCUIT ANALYSIS II

Instructor: _____
Office hours: _____
Class hours: _____

Major Instructional Areas

- Linear systems
- Transfer function
- Stability
- Sinusoidal Steady-State Analysis and Phasor Representation of Voltages and currents
- Steady state impedance
- Complete Sinusoidal steady-state circuit solutions
- Relationship between Laplace domain and phasor domain
- Steady-state transfer function
- Bode plot forms
- Second-order low-pass function
- DC and RMS values of periodic signals
- Synthesis of complex waveforms
- Fourier series
- Fourier transform

Course Objectives

Upon successful completion of this course, the student should be able to:

1. Determine the transfer function [F(s)] for a circuit, given its schematic with component values.
2. Derive a system's output expression (as a time function) given its input expression and transfer function (or sufficient information to derive the transfer function).
3. Determine the stability of a system, given its transfer function and output equation or a pole-zero diagram.
4. Determine the composite transfer function of a system of individual functions.
5. Perform a steady-state phasor form analysis of a given circuit, and graph and analyze its Bode plot for its breakpoint decibel amplitude response and its phase response.
6. Describe the damping of a second-order circuit by determining and analyzing its natural-response frequency and damping ratio.
7. Analyze a given waveform for symmetry conditions and specify what limits these conditions dictate for the spectrum of the waveform.

Teaching Strategies

Curriculum is designed to promote a variety of teaching strategies that support the outcomes described in the course objectives and that foster higher cognitive skills. Delivery makes use of various media and delivery tools in the classrooms.

Student Textbook

- Stanley, William D. 2006. *Network Analysis with Applications, Custom 2nd Edition. Boston, MA: Pearson Custom Publishing.*
- Snyder, Gary. 2011. *Multisim Circuit Files for Advanced Circuit Analysis I and II CD, Custom 1st Edition. Boston, MA: Pearson Custom Publishing.*
- National Instruments. 2011. *Multisim Guide, Custom 1st Edition. Boston, MA: Pearson Custom Publishing.*

Course Outline

Unit	Topic (Lecture Period)	Chapters	Lab and Other Coverage
1	Transfer Functions	7	Lab, Homework Exercises
2	Transfer Functions (contd.)	7	Lab, Homework Exercises
3	Exam I Sinusoidal Steady-State Analysis	8	Lab, Homework Exercises
4	Sinusoidal Steady-State Analysis (contd.)	8	Lab, Homework Exercises
5	Frequency Response Analysis and Bode Plots	9	Lab, Homework Exercises
6	Frequency Response Analysis and Bode Plots (contd.)	9	Lab, Homework Exercises
7	Exam II Waveform Analysis	10	Lab, Homework Exercises
8	Waveform Analysis (contd.)	10	Lab, Homework Exercises
9	Fourier Analysis	11	Lab, Homework Exercises
10	Fourier Analysis (contd.)	11	Lab, Homework Exercises
11	Exam III Review and Final Project		The final project will be based on the content covered in Chapters 7-11.

Evaluation Criteria and Grade Weights

- Homework 30%
- Lab Assignments 25%
- Exam 1 10%
- Exam 2 10%
- Exam 3 10%
- Final Project 15%
-

Final grades will be calculated from the percentages earned in class as follows:

A	90 - 100%	4.0
B+	85 - 89%	3.5
B	80 - 84%	3.0
C+	75 - 79%	2.5
C	70 - 74%	2.0
D+	65 - 69%	1.5
D	60 - 64%	1.0
F	<60%	0.0