University of Toledo
Electrical Engineering Technology
Master Syllabus

Course Title: Network Analysis **Course Code & Number:** EET-3250

Credit Hour Total: 4 **Weekly Contact Hours Lecture Hours:** 4 **Lab Contact Hours:** 0

Prerequisites: Reactive Circuits (EET 1020) and Differential Equations (ENGT 3020)

Text: W.D. Stanley, Transform Circuit Analysis for Engineering & Technology, 5th Ed, Prentice Hall. 2002

Course Coordinator: Evans

A. Course Description

This course consists of analysis of electrical wave-forms and first order time domain circuits, transient analysis of reactive circuits using Laplace transforms, system transfer functions, Bode plots and the interpretations of Fourier series and transforms.

B. Related Program Outcomes:

ABET/Student OutcomesEET

a. An understanding of the analytical skills associated with electrical engineering technology, as evidenced by the ability to perform analyses of the transient behavior of RLC circuits with Laplace transforms.

d. An ability to use creativity in the design of electrical systems as evidenced by the use of simulation software to iteratively solve a circuit design problem regarding transient behavior.

f. An ability to identify, analyze and solve technical problems associated with Electrical Engineering Technology as evidence by the ability to create a transfer function for an electrical system based on computer simulations of the system step response.

g. An ability to communicate effectively, as evidenced by written reports.

EET Program Outcomes

None

C. Course Objectives:

1. Become proficient in the use of mathematical waveform models.
2. Become proficient in the use of Laplace transform techniques to analyze the transient behavior of reactive circuits.
3. Become proficient in the determination and manipulation of electrical system transfer functions.
4. Become proficient in the creation of Bode plots.
5. Apply mathematical models to the science of electric circuit analysis.
6. Creatively use computer simulation models to solve electric circuit problems.

7. Identify and solve time domain, transform domain, and frequency domain electric circuit problems.
8. Communicate the results of circuit analyses in written reports.

D. Course Outline – Major Content Areas

- Waveform analyses.
- Time domain circuit models
- Transient circuit analysis with differential equations in the time domain.
- Laplace transforms and inverse Laplace transforms.
- Transform domain circuit models.
- Transient circuit analysis with Laplace transforms.
- Transfer functions.
- Sinusoidal steady state behavior and Bode plots.
- Fourier analysis.

E. Major Laboratory Topics

- There is no laboratory associated with this course, but students are given two electrical problems to solve with the assistance of simulation software, one involving the design of a circuit for a desired transient behavior, and the other involving the determination of a circuit transfer function based on the circuit step response. Students are expected to submit their results in written reports.