New Jersey Institute of Technology
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NEWARK COLLEGE OF ENGINEERING

SYLLABUS AND COURSE INFORMATION

Course Name:	Circuit Analysis: Transform Methods
Course Number:	ECET 300
Course Structure:	3-0-3 (lecture hr/wk – lab hr/wk – course credits)
Course Description:	The principles, theorems and techniques of circuit analysis are reviewed. The technique of waveform and circuit transforms is introduced. Laplace transforms are studied and applied in the solution of circuit problems with a variety of input functions. Fourier analysis also is introduced. Extensive use of computer simulation software.
Prerequisites:	(ECET 303 or ECE 232) and (Math 238 or Math 112)
Corequisites:	Math 322 or Math 222
Required, Elective, or Selected Elective:	Required
Required Materials:	**Text:** Name: Transform Circuit Analysis for Engineering and Tech Author: William D. Stanley Year: 2002 ISBN: 978-0-13-060259-6

Course Outcomes: By the end of the course students are able to:

1. Demonstrate the proper use of MATLAB to perform data analysis and graphing to solve technical problems.
2. Use Laplace Transforms to solve various RLC circuit problems.
3. Identify the best circuit theory to apply to various RLC circuits to solve for voltage and current measurements, and utilize these theories to solve these circuit problems.
4. Simulate a circuit with the use of Multisim to obtain a prior understanding of a circuit's behavior, and incorporate these results in a laboratory report.
5. List the differences between time and frequency analysis.
6. Theoretically and experimentally generate a Bode plot, as well as simulate these results with Multisim.
7. Write an effective laboratory report according to acceptable criteria.
8. Demonstrate solutions of differential equations using transforms
9. Calculate integration and differentiation of various waveforms using graphical methods.
10. Demonstrate the relationship between various signals and their spectrum.

New Jersey's Science & Technology University

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Class Topics:

Complex Numbers	Elementary Functions
Addition of Sinusoids	Shifted Functions
Impulse Functions	Differentiation and Integration
Laplace Transforms	Capacitors and Inductors
Inverse Laplace Transforms	System Considerations
Steady State Analysis	Bode Plots
Fourier Series and Transforms	

Student Outcomes: The Course Learning Outcomes support achievement of the following Student Outcomes from the ETAC of ABET Criterion 3 requirements.

Student Outcome a: An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities.
Related Course Learning Outcomes: 4 & 6

Student Outcome b: An ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies.
Related Course Learning Outcomes: 2 & 3

Student Outcome f: An ability to identify, analyze, and solve broadly-defined engineering technology problems.
Related Course Learning Outcomes: 4

Student Outcome p: The ability to utilize differential and integral calculus, as a minimum, to characterize the performance of electrical/electronic systems.
Related Course Learning Outcomes: 8, 9, & 10

Academic Integrity: NJIT has a zero-tolerance policy regarding cheating of any kind and student behavior that is disruptive to a learning environment. Any incidents will be immediately reported to the Dean of Students. Please visit the Dean of Students website at http://www.njit.edu/doss for a list of student policies relating to academic integrity and student conduct.

Modification to Course: The Course Outline may be modified at the discretion of the instructor or in the event of extenuating circumstances. Students will be notified in class of any changes to the Course Outline.

Prepared By: Daniel Brateris

Course Coordinator: Daniel Brateris