



COURSE OUTLINE: ELR309 - NUMERIC & NETWK ANAL

Prepared: Juhani Paloniemi

Approved: Corey Meunier, Chair, Technology and Skilled Trades

Course Code: Title	ELR309: NUMERICAL AND NETWORK ANALYSIS
Program Number: Name	4029: ELECTRICAL TY-PROCES
Department:	ELECT./INSTRUMENTATION PS
Semesters/Terms:	19W
Course Description:	An in-depth study of A.C. and D.C. circuits using network theorems, differential equations and Laplace transforms.
Total Credits:	7
Hours/Week:	5
Total Hours:	75
Prerequisites:	ELR109, MTH577
Corequisites:	There are no co-requisites for this course.
Vocational Learning Outcomes (VLO's) addressed in this course: Please refer to program web page for a complete listing of program outcomes where applicable.	4029 - ELECTRICAL TY-PROCES VLO 2 Analyze and solve complex technical problems related to electrical systems by applying mathematics and science principles.
Essential Employability Skills (EES) addressed in this course:	EES 3 Execute mathematical operations accurately. EES 4 Apply a systematic approach to solve problems.
Course Evaluation:	Passing Grade: 50%, D
Other Course Evaluation & Assessment Requirements:	Grade Definition Grade Point Equivalent A+ 90 - 100% 4.00 A 80 - 89% B 70 - 79% 3.00 C 60 - 69% 2.00 D 50 - 59% 1.00 F (Fail) 49% and below 0.00 CR (Credit) Credit for diploma requirements has been awarded. S Satisfactory achievement in field /clinical placement or non-graded subject area. U Unsatisfactory achievement in field/clinical placement or non-graded subject area. X A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course. NR Grade not reported to Registrar's office. W Student has withdrawn from the course without academic penalty.
Books and Required	Network Analysis for ELR309 by Doug Faggetter



SAULT COLLEGE | 443 NORTHERN AVENUE | SAULT STE. MARIE, ON P6B 4J3, CANADA | 705-759-2554

Resources:	Publisher: AK Graphics - Sault College							
Course Outcomes and Learning Objectives:	Course Outcome 1	Learning Objectives for Course Outcome 1						
	Analyze a resistive circuit using Nodal analysis and Mesh analysis.	Using a matrix solution of the network equations, determine the voltage and current in the elements of a resistive circuit.						
	Course Outcome 2	Learning Objectives for Course Outcome 2						
	Analyze First-Order circuits.	Write and solve a differential equation for a network with resistors a capacitor. Write and solve a differential equation for a network with resistors and an inductor.						
	Course Outcome 3	Learning Objectives for Course Outcome 3						
	Analyze Second-Order circuits using differential equations.	Write and solve a differential equation for a Second-Order circuit with resistors, inductors and capacitors. Solve the differential equation for a Second-Order circuit with excitation by initial conditions, excitation by a source and excitation by initial conditions and a source. Write complementary, particular and complete solutions. Solve for the under-damped case, critically-damped case and over-damped case.						
	Course Outcome 4	Learning Objectives for Course Outcome 4						
	Analyze First-Order and Second-Order circuits using Laplace transforms.	Define the Laplace transform. Analyze a circuit with a transformed network if excited by a source. Analyze a circuit by transforming the differential equation if the circuit is excited by initial conditions and a source.						
Evaluation Process and Grading System:	<table> <tr> <th>Evaluation Type</th><th>Evaluation Weight</th><th>Course Outcome Assessed</th></tr> <tr> <td>Tests (4 evenly weighted)</td><td>100%</td><td></td></tr> </table>		Evaluation Type	Evaluation Weight	Course Outcome Assessed	Tests (4 evenly weighted)	100%	
Evaluation Type	Evaluation Weight	Course Outcome Assessed						
Tests (4 evenly weighted)	100%							
Date:	August 20, 2018							
	Please refer to the course outline addendum on the Learning Management System for further information.							