COURSE OUTLINE: ELR309 - NUMERIC & NETWK ANAL

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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 andLaplace 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 W Student has withdrawn from the course without academic penalty.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

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:

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.