Prepared: Juhani Paloniemi Approved: Corey Meunier

Course Code: Title	ELR309: NUMERICAL AND NETWORK ANALYSIS
Program Number: Name	4029: ELECTRICAL TY-PROCES
Department:	ELECT./INSTRUMENTATION PS
Semester/Term:	18W
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
Vocational Learning Outcomes (VLO's): **Please refer to program web page for a complete listing of program outcomes where applicable.**	**4029 - ELECTRICAL TY-PROCES** #2. Analyze and solve complex technical problems related to electrical systems by applying mathematics and science principles.
Essential Employability Skills (EES):	#3. Execute mathematical operations accurately. #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W Student has withdrawn from the course without academic penalty.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Tests (4 evenly weighted)	100%

Books and Required Resources:

Network Analysis for ELR309 by Doug Faggetter
Publisher: AK Graphics - Sault College

Course Outcomes and Learning Objectives:

Course Outcome 1.

Analyze a resistive circuit using Nodal analysis and Mesh analysis.

Learning Objectives 1.

Using a matrix solution of the network equations, determine the voltage and current in the elements of a resistive circuit.

Course Outcome 2.

Analyze First-Order circuits.

Learning Objectives 2.

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.

Analyze Second-Order circuits using differential equations.

Learning Objectives 3.

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.

Analyze First-Order and Second-Order circuits using Laplace transforms.

Learning Objectives 4.

	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.
Date:	Tuesday, January 2, 2018
	Please refer to the course outline addendum on the Learning Management System for further information.