



COURSE OUTLINE

ELR109

Prepared: A. Gooderham Approved: Corey Meunier

Course Code: Title	ELR109: AC CIRCUIT ANALYSIS & MACHINES
Program Number: Name	4026: ELECTRICAL TN-PROC
Department:	ELECT./INSTRUMENTATION PS
Semester/Term:	18W
Course Description:	This course is an analytical study of series, parallel and series-parallel A.C. impedance networks, network theorems and polyphase circuits. Concurrently an introduction to A.C. and D.C. motors and generators together with their control methods is studied using complex math.
Total Credits:	5
Hours/Week:	5
Total Hours:	75
Prerequisites:	ELR100
This course is a pre-requisite for:	ELN213, ELN229, ELN237, ELR215, ELR232, ELR251, ELR309
Vocational Learning Outcomes (VLO's): Please refer to program web page for a complete listing of program outcomes where applicable.	4026 - ELECTRICAL TN-PROC #1. Interpret and produce electrical and electronics drawings including other related documents and graphics. #2. Analyze and solve routine technical problems related to electrical systems by applying mathematics and science principles. #6. Verify acceptable functionality and apply troubleshooting techniques for electrical and electronic circuits, components, equipment, and systems under the supervision of a qualified person. #8. Use computer skills and tools to solve routine electrical related problems. #13. Perform tasks in accordance with relevant legislation, policies, procedures, standards, regulations, and ethical principles. #16. Select electrical equipment, systems and components to fulfill the requirements and specifications under the supervision of a qualified person.
Essential Employability Skills (EES):	#1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience. #2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.

- #3. Execute mathematical operations accurately.
- #4. Apply a systematic approach to solve problems.
- #5. Use a variety of thinking skills to anticipate and solve problems.
- #6. Locate, select, organize, and document information using appropriate technology and information systems.
- #7. Analyze, evaluate, and apply relevant information from a variety of sources.
- #8. Show respect for the diverse opinions, values, belief systems, and contributions of others.
- #9. Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.
- #11. Take responsibility for ones own actions, decisions, and consequences.

General Education Themes: Personal Understanding
 Science and Technology

Course Evaluation: Passing Grade: 50%, D

Other Course Evaluation & Assessment Requirements: If a student misses a test or surprise quiz (maximum 5% of final grade) without contacting the instructor, the Deans office or the switchboard prior to the test or quiz, a mark of zero will be granted without a re-write option.

Surprise Quizzes may be given for a maximum of 5% of the final grade and are attributed toward the next test percentage value.

No rewrites are given for any test attempted.

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
Review Assignment	1%
Test1	33%
Test2	33%
Test3	33%

Books and Required Resources: Fundamentals of Electric Circuits by Bell
 Publisher: Oxford Edition: 7
 ISBN: 978-0-19-542524-6

Course Outcomes and Course Outcome 1.

Learning Objectives:

Analyse a DC circuit containing capacitors and resistors, to determine charge and discharge characteristics

Learning Objectives 1.

Completion of RC cct questions regarding time constants
Completion of RC cct questions requiring the solution of the time for threshold voltage or current level achievement
Completion of test

Course Outcome 2.

Determine the impedance and operation of single-phase AC circuits using phasors and complex math.

Learning Objectives 2.

Completion of complex math questions including the j operator
Completion of basic trigonometry questions
Completion of polar and rectangular conversions
Analysis of single-phase circuit operation using complex math, to find impedance(s), voltage and current values
Completion of test

Course Outcome 3.

Analyse a three-phase cct with respect to type (Delta or Wye) and solve for both line and phase voltages and currents.

Learning Objectives 3.

Completion of three-phase cct questions regarding line and phase values
Completion of three-phase cct questions having combinations of delta and wye generators and impedance loads
Completion of three-phase transformer connections and values
Analysis of ideal vs real transformer model calculations, including no-load vs full-load phasor diagrams using R, L and C loads
Investigate the characteristics of 3-phase synchronous AC generators
Completion of test

Date:

Tuesday, January 2, 2018

Please refer to the course outline addendum on the Learning Management System for further information.