COURSE OUTLINE: ELR720 - ELECTRICAL THEORY 2

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Course Code: Title	ELR720: ELECTRICAL THEORY - LEVEL 2
Program Number: Name	6521: CONST & MTCE ELE INT
Department:	ELEC. APPRENTICES
Academic Year:	2022-2023
Course Description:	This course covers magnetism, direct current machines, alternating current circuit theory and single phase transformers.
Total Credits:	8
Hours/Week:	6
Total Hours:	60
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Essential Employability Skills (EES) addressed in this course:	EES 3 Execute mathematical operations accurately. EES 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 6 Locate, select, organize, and document information using appropriate technology and information systems. EES 7 Analyze, evaluate, and apply relevant information from a variety of sources. EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others. EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals. EES 11 Take responsibility for ones own actions, decisions, and consequences.
General Education Themes:	Science and Technology
Course Evaluation:	Passing Grade: 50%, D A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.
Other Course Evaluation & Assessment Requirements:	There are no make-up tests, assignments or extra work allowed for any reason. Any material covered during any absence legitimate or not is the responsibility of the student. Deadlines will be specified for submission of assignments for grading. Late assignments will not be accepted and a grade of 0 will be assigned. 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W Student has withdrawn from the course without academic penalty.
Cell Phones will turned off and put away during tests.
Smart Watches will be removed and put away during tests
If your phone or watch rings during a test, the test will be immediately collected and a score of 0 will be assessed.

Books and Required Resources:

Delmar`s Standard Textbook by Delmar
Publisher: Nelson Canada Edition: 7
ISBN: 978-0-17-665681-2

Course Outcomes and Learning Objectives:

Course Outcome 1	**Learning Objectives for Course Outcome 1**
1.1 Magnetism 1.2 Magnetic Induction 1.3 Basic Trigonometry and Vectors 1.4 Alternating Current (AC) 1.5 Inductance in AC circuits	1.1 Describe magnetic flux and flux density. 1.2 Solve problems associated with magnetic energy, including magnetic potential difference, flux density, reluctance, permeance, and permeability. 1.3 List and explain the factors that affect the magnitude and direction of induced EMF in single conductors and in coils. 1.4 Describe factors which affect inductance and perform related calculations. 1.5 State Fleming hand rules. 1.6 State and apply Lenz`s law. 1.7 Describe the creation and effects of eddy currents. 1.8 Describe a sine wave, calculate RMS average, maximum and instantaneous values. 1.9 Explain and calculate frequency, electrical and mechanical degrees.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
Resistive-Inductive Series Circuits 2.1 Capacitors 2.2 Capacitors in AC Circuits 2.3 Resistive-Capacitive Series Circuits 2.4 Resistive-Inductive-Capacitive Series Circuits	2.1 Describe capacitance and the characteristics of a capacitor connected to a DC source. 2.2 Describe the characteristics of a capacitor connected to an AC source. 2.3 Calculate the capacitive reactance, voltage, current, power and phase relationships of a capacitive circuit. 2.4 Calculate the values for RL/RC/RLC series circuits. 2.5 Describe and calculate resonant circuits and phase relations
Course Outcome 3	**Learning Objectives for Course Outcome 3**

3.1 Resistive-Inductive Parallel Circuits 3.2 Resistive-Capacitive Parallel Circuits 3.3 Resistive-Inductive-Capacitive Parallel Circuits 3.4 Single Phase Transformers 3.5 DC Generators 3.6 DC Motors	3.1 Explain and calculate RL/RC parallel circuits. 3.2 Label, describe and calculate values for RLC parallel circuits. 3.3 Describe the method for testing RLC parallel circuits. 3.4 Explain and calculate RLC parallel circuits. 3.5 Explain and calculate the efficiency of AC loads as related to power factor correction. 3.6 Explain the effects of power factor correction and calculate power factor correction for single-phase loads. 3.7 Describe the principles of operation of various types of single phase transformers. 3.8 Determine and perform calculations involving turns/voltage/current ratios for single phase transformers 3.9 Describe the construction, operation and characteristics of permanent magnet, separately excited, shunt , series and compound (cumulative and differential) DC motors and generators. 3.10 Draw connection diagrams for all types of DC motors and generators.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments	15%
Quizes	5%
Test1	25%
Test2	30%
Test3	25%

Date: July 11, 2022

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