



COURSE OUTLINE

ELR111

Prepared: J. Paloniemi, Mark Allemang Approved: Corey Meunier

Course Code: Title	ELR111: ELECTRIC AND ELECTRONIC CONTROLS
Program Number: Name	4039: MECH. ENG. TN-MANUFA
Department:	ELECT./INSTRUMENTATION PS
Semester/Term:	18S
Course Description:	This course introduces the student to the fundamentals of electricity and electrical controls. Safety issues, provincial and national codes relating to electrical installations, and characteristics of electric circuits are also introduced.
Total Credits:	1
Hours/Week:	1
Total Hours:	15
Substitutes:	ELR100, ELR130, ELR206
This course is a pre-requisite for:	ELR213
Vocational Learning Outcomes (VLO's):	4039 - MECH. ENG. TN-MANUFA #1. Complete all work in compliance with current legislation, standards, regulations and guidelines. #3. Comply with current health and safety legislation, as well as organizational practices and procedures.
<small>Please refer to program web page for a complete listing of program outcomes where applicable.</small>	
Essential Employability Skills (EES):	#3. Execute mathematical operations accurately. #4. Apply a systematic approach to solve problems. #11. Take responsibility for ones own actions, decisions, and consequences.
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W Student has withdrawn from the course without academic penalty.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 (2 or 3 equally weighted)	100%

Course Outcomes and Learning Objectives:

Course Outcome 1.

List and describe the purpose of various codes associated with electrical installations.

Learning Objectives 1.

Describe the purpose and scope of the Canadian Electrical Code (CSA Standard C22.1).
Describe the purpose and scope of the Ontario Electrical Safety Code and how it is related to the Canadian Electrical Code.

Course Outcome 2.

Describe the purpose and function of electrical components as they relate to safety.

Learning Objectives 2.

Describe the purpose and function of fuses.
Describe the purpose and function of circuit breakers.
Describe the purpose, function and limitations of isolating switches.
Describe the purpose and function of lock-outs.
Describe the purpose and function of shut-off procedures.

Course Outcome 3.

Describe atomic theory and electricity.

Learning Objectives 3.

List and describe the components of an atom.
Define molecule, element and compound.
Describe static charges and electromotive force.
List sources of electromotive force.
Describe the characteristics of conductors, insulators and semiconductors.
Define voltage, current and resistance.
Describe alternating current (ac) and direct current (dc) listing sources and applications of each.
Describe the characteristics of a simple electric circuit.
State and perform calculations using Ohm's Law.

Course Outcome 4.

Analyze simple series and parallel circuits with a direct current supply.

Learning Objectives 4.

Describe characteristics and applications of series circuits.

Use Ohm's Law to solve for current, voltages and resistances in series circuits.

Describe characteristics and applications of parallel circuits.

Use Ohm's Law to solve for voltage, currents and resistances in parallel circuits.

Describe applications of series-parallel circuits.

Course Outcome 5.

Identify, select and use electrical test instruments safely.

Learning Objectives 5.

Describe how voltage is measured in an electric circuit and how the type (ac or dc) and magnitude of the voltage affects the type of meter used, how the meter is used and how the meter is set up.

Describe how current is measured in an electric circuit and how the type (ac or dc) and magnitude of the current affects the type of meter used, how the meter is used and how the meter is set up.

Describe how resistance of components and circuits is measured.

Describe how insulation of electrical components and circuits is tested and how the test equipment can differ from a standard ohm-meter.

Describe the consequences of incorrectly connecting or applying various electrical test instruments.

Course Outcome 6.

Describe the principles of grounding as it pertains to safety.

Learning Objectives 6.

Describe how electrical systems are grounded.

Define bonding.

Describe how grounding and bonding are related and how they differ.

Describe how grounding and bonding assist the operation of protective devices such as fuses and circuit breakers.

Describe how grounding and bonding reduce the risk and severity of electric shock.

Date:

Monday, April 23, 2018

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