



## COURSE OUTLINE: ELR213 - ELECT. CONTROLS II

Prepared: Randy Clouthier

Approved: Corey Meunier, Chair, Technology and Skilled Trades

<b>Course Code: Title</b>	ELR213: ELECTRICAL/ELECTRONIC CONTROLS II
<b>Program Number: Name</b>	4039: MECH. ENG. TN-MANUFA
<b>Department:</b>	ELECT./INSTRUMENTATION PS
<b>Semesters/Terms:</b>	19F
<b>Course Description:</b>	This course covers the basic knowledge of electrical and electronic controls. Students will learn about safely removing and resetting electrical and electronic devices such as fuses, circuit breakers and about lockouts and shutoff procedures. The student will appreciate diagnostic testing and applications of electronic devices in control systems
<b>Total Credits:</b>	1
<b>Hours/Week:</b>	1
<b>Total Hours:</b>	15
<b>Prerequisites:</b>	ELR111
<b>Corequisites:</b>	There are no co-requisites for this course.
<b>Substitutes:</b>	MCH315
<b>Vocational Learning Outcomes (VLO's) addressed in this course:</b>	<b>4039 - MECH. ENG. TN-MANUFA</b> VLO 3 Comply with current health and safety legislation, as well as organizational practices and procedures. VLO 6 Analyze and solve mechanical problems by applying mathematics and fundamentals of mechanical engineering.
<b>Please refer to program web page for a complete listing of program outcomes where applicable.</b>	
<b>Essential Employability Skills (EES) addressed in this course:</b>	EES 4 Apply a systematic approach to solve problems.
<b>Course Evaluation:</b>	Passing Grade: 50%, D
<b>Other Course Evaluation &amp; Assessment Requirements:</b>	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.



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NR Grade not reported to Registrar's office.  
W Student has withdrawn from the course without academic penalty.

**Course Outcomes and Learning Objectives:**

Course Outcome 1	Learning Objectives for Course Outcome 1
1. To develop the student's basic knowledge concerning electrical and electronic theory.	1.1 Review the use of basic electrical testing instruments 1.2 Review and safely demonstrate the troubleshooting, removal, and resetting of electrical and electronic overload devices such as: - Fuses - Circuit breakers - Ground fault circuit interrupters GFCI 1.2 Review and safely demonstrate the following: - Basic general lock-out and tag-out equipment and procedures - General shut off procedures
Course Outcome 2	Learning Objectives for Course Outcome 2
2. To develop the student's basic knowledge concerning control systems.	2.1 Introduce open and closed loop control systems. 2.2 Differentiate between analog and digital signals 2.3 Describe, briefly, the devices used in a control system such as: - Limit switches - Proximity switches - Photo cells - Inductive and capacitive sensors - Solenoids - Linear variable differential transformers (LVDT) - Vibration transducers - Displacement, velocity and accelerometer devices 2.4 Thermal devices such as: - Thermostats - Thermocouples - Bimetallic strip devices - Metal resistance thermometers - Thermistors - Thermal expansion devices 2.5 Miscellaneous transducers such as: - Bourdon tube - Pressure switches - Diaphragm - Bellows - Piezoelectric - Strain gauge

**Evaluation Process and Grading System:**

Evaluation Type	Evaluation Weight
Assignments / Attendance	20%
Tests (2 equally weighted)	80%

**Date:**

August 27, 2019

**Addendum:**

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

