



COURSE OUTLINE: ELR822 - INSTRUMENTATION 3

Prepared: Randy Clouthier

Approved: Corey Meunier, Chair, Technology and Skilled Trades

Course Code: Title	ELR822: INSTRUMENTATION - LEVEL 3
Program Number: Name	6522: CONST & MTCE ELE ADV
Department:	ELEC. APPRENTICES
Semesters/Terms:	20W
Course Description:	Upon successful completion of Instrumentation III, the apprentice is able to: describe: explain the terminology of instrumentation systems: explain the principles of On/Off control: identify the four basic elements of control: explain automatic control: Explain the operation and application of position measurement devices: Explain the principles of PID control: Revise and explain loops on instrumentation drawings. /understand pneumatic systems.
Total Credits:	4
Hours/Week:	3
Total Hours:	30
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:	<div>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.</div> <div>EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication.</div> <div>EES 3 Execute mathematical operations accurately.</div> <div>EES 4 Apply a systematic approach to solve problems.</div> <div>EES 5 Use a variety of thinking skills to anticipate and solve problems.</div> <div>EES 6 Locate, select, organize, and document information using appropriate technology and information systems.</div> <div>EES 7 Analyze, evaluate, and apply relevant information from a variety of sources.</div> <div>EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others.</div> <div>EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.</div> <div>EES 10 Manage the use of time and other resources to complete projects.</div> <div>EES 11 Take responsibility for ones own actions, decisions, and consequences.</div>
Course Evaluation:	Passing Grade: 50%, D
Other Course Evaluation & Assessment Requirements:	EVALUATION PROCESS/GRADING SYSTEM: Theory tests 50% Labs written portion 20% Labs Practical tests 20% Assignments & quiz 10% Total 100%



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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.
Smart watches and similar devices are not allowed during tests and quizzes.

Books and Required Resources:

Lab Volt Process Control Training Manual by Sault College

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
Explain the principles of measured variable vs controlled variable. Feed back, open loop vs. closed loop, transducers.	
Course Outcome 2	Learning Objectives for Course Outcome 2
Describe the use of and list requirements for instrumentation air supplies.	
Course Outcome 3	Learning Objectives for Course Outcome 3
Describe the construction and application of mechanical and electrical operated valves.	
Course Outcome 4	Learning Objectives for Course Outcome 4
Identify the ISA and European symbols used for pneumatic control devices.	
Course Outcome 5	Learning Objectives for Course Outcome 5
Describe the theory of operation and the typical application of proportional 3-15 psi pneumatic instrumentation systems.	



	Course Outcome 6	Learning Objectives for Course Outcome 6
	Explain the operation and application of typical position measurement devices found in industry including shaft encoders, resolvers, proximity switches, LVDTs, and synchros.	
	Course Outcome 7	Learning Objectives for Course Outcome 7
	Explain the principles of PID control.	
	Course Outcome 8	Learning Objectives for Course Outcome 8
	Connect and test PID controlled process to demonstrate the effects of varying P,I and D.	
	Course Outcome 9	Learning Objectives for Course Outcome 9
	Revise and explain control loops on instrumentation drawings using ISA standards.	
Date:	February 27, 2020	
Addendum:	Please refer to the course outline addendum on the Learning Management System for further information.	