



COURSE OUTLINE: ELR622 - INSTRUMENTATION I

Prepared: Randy Clouthier

Approved: Corey Meunier, Chair, Technology and Skilled Trades

Course Code: Title	ELR622: INSTRUMENTATION - LEVEL 1
Program Number: Name	6520: CONST & MTCE ELE BAS 6540: IND.ELECT. - BASIC
Department:	ELEC. APPRENTICES
Academic Year:	2023-2024
Course Description:	This course is an introduction to instrumentation symbols and terminology. Temperature and pressure measurement will be studied in detail.
Total Credits:	3
Hours/Week:	3
Total Hours:	24
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Vocational Learning Outcomes (VLO's) addressed in this course:	6520 - CONST & MTCE ELE BAS VLO 1 Const and Maint Electrician - Basic
Please refer to program web page for a complete listing of program outcomes where applicable.	6540 - IND.ELECT. - BASIC VLO 1 Industrial Electrician - Basic
Essential Employability Skills (EES) addressed in this course:	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. EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication. 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 10 Manage the use of time and other resources to complete projects. EES 11 Take responsibility for ones own actions, decisions, and consequences.



Course Evaluation:	Satisfactory/Unsatisfactory & A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.								
Other Course Evaluation & Assessment Requirements:	<p>The student must pass both the written tests and the practical tests to pass the course.</p> <p>Smart watches, smart phones and similar devices are not allowed during tests or quizzes and must be removed. Smart phones are not acceptable for use as a calculator during a test or quiz.</p> <p>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</p> <p>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.</p>								
Books and Required Resources:	Lab Volt Process Control Training Manual by Sault College Publisher: AK Graphics LABVOLT ELN229 (Sault Coll)								
Course Outcomes and Learning Objectives:	<table border="1"> <thead> <tr> <th data-bbox="508 942 800 977">Course Outcome 1</th> <th data-bbox="808 942 1435 977">Learning Objectives for Course Outcome 1</th> </tr> </thead> <tbody> <tr> <td data-bbox="508 986 800 1133">1. Describe Instrumentation and Process Control and understand related terminology.</td> <td data-bbox="808 986 1435 1133">1.1 Explain what Instrumentation is. 1.2 Explain what Process Control is. 1.3 Describe the major components of a process control loop. 1.4 Draw the block diagram of a process control loop. 1.5 Understand instrumentation units, symbols and terminology (I.S.A.).</td> </tr> <tr> <th data-bbox="508 1142 800 1177">Course Outcome 2</th> <th data-bbox="808 1142 1435 1177">Learning Objectives for Course Outcome 2</th> </tr> <tr> <td data-bbox="508 1185 800 1437">2. Understand temperature measurement, devices, and applications.</td> <td data-bbox="808 1185 1435 1437">2.1 Understand the difference between temperature and heat. 2.2 Convert from one temperature scale to another. 2.3 Describe the physical and operating characteristics of filled system thermometers, thermocouples (T/C), resistance temperature detectors (RTD) and thermistors. 2.4 Calibrate and explain the operation of thermocouple and RTD transmitters. 2.5 Describe methods of measuring temperature. 2.6 Select, install, and calibrate temperature measurement devices.</td> </tr> </tbody> </table>	Course Outcome 1	Learning Objectives for Course Outcome 1	1. Describe Instrumentation and Process Control and understand related terminology.	1.1 Explain what Instrumentation is. 1.2 Explain what Process Control is. 1.3 Describe the major components of a process control loop. 1.4 Draw the block diagram of a process control loop. 1.5 Understand instrumentation units, symbols and terminology (I.S.A.).	Course Outcome 2	Learning Objectives for Course Outcome 2	2. Understand temperature measurement, devices, and applications.	2.1 Understand the difference between temperature and heat. 2.2 Convert from one temperature scale to another. 2.3 Describe the physical and operating characteristics of filled system thermometers, thermocouples (T/C), resistance temperature detectors (RTD) and thermistors. 2.4 Calibrate and explain the operation of thermocouple and RTD transmitters. 2.5 Describe methods of measuring temperature. 2.6 Select, install, and calibrate temperature measurement devices.
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	Course Outcome 3	Learning Objectives for Course Outcome 3
	3. Understand pressure measurement, devices, and applications.	3.1 Define the term fluids and fluid mechanics. 3.2 Derive units of force, energy and pressure in SI and English units. 3.3 Perform unit conversions and calculations. 3.4 Describe methods of measuring pressure.

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments and Quizzes	10%
Labs	20%
Practical Tests	20%
Written Tests	50%

Date: May 30, 2023

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