

I. COURSE DESCRIPTION:

This course introduces the student to the principles of Instrumentation and Process Control. The measurement of process variables such as temperature and pressure will be studied in detail and applied in the practical component of the course.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. *Describe Instrumentation and Process Control and understand Related terminology.***Potential Elements of the Performance:**

- Explain what Instrumentation is.
- Explain what Process Control is.
- Describe the major components of a process control loop.
- Draw the block diagram of a process control loop.
- Understand instrumentation units, symbols and terminology.(I.S.A.)

2. *Understand temperature measurement, devices and applications.***Potential Elements of the Performance:**

- Understand the difference between temperature and heat.
- Convert from one temperature scale to another.
- Describe the physical and operating characteristics of filled system thermometers, thermocouples, resistance temperature detectors and thermistors.
- Calibrate and explain the operation of thermocouple and RTD transmitters
- Describe methods of measuring temperature.
- Select, install and calibrate temperature measurement devices

3. *Understand pressure measurement, devices and applications.***Potential Elements of the Performance:**

- Define the term fluids and fluid mechanics
- Derive units of force, energy and pressure in SI and English units
- Perform unit conversions and calculations
- Define the term density, weight density and specific gravity
- Derive the relationship between mass density and weight density
- Express pressure as equivalent liquid column
- Differentiate between gauge, absolute and vacuum pressure

- Describe methods of measuring pressure
- Select install and calibrate pressure measurement devices

III. TOPICS:

1. INTRODUCTION AND OVERVIEW
2. TEMPERATURE MEASUREMENT AND APPLICATIONS
3. PRESSURE MEASUREMENT AND APPLICATIONS

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Lab Volt Process Control Training Manuals

V. EVALUATION PROCESS/GRADING SYSTEM:

The final grade will be derived as follows:

Two theory tests and quizzes	60%
One practical test and lab reports	30%
Attendance and work ethics	<u>10%</u>
TOTAL	100%

The following semester grades will be assigned to students:

Grade	<u>Definition</u>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	
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.	

VI. SPECIAL NOTES:Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.