

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



**SAULT  
COLLEGE**

**COURSE OUTLINE**

**COURSE TITLE:** INSTRUMENTATION III

**CODE NO.** ELR822 **SEMESTER:**

**PROGRAM:** CONSTRUCTION & MAINTENANCE ELECTRICIAN

**AUTHOR:** FRANK MUSSO

**DATE:** JAN **PREVIOUS OUTLINE DATED:** JAN  
2011 2010

**APPROVED:** *“Corey Meunier”*  
CHAIR \_\_\_\_\_  
DATE

**TOTAL CREDITS:**

**PREREQUISITE(S):**

**HOURS/WEEK:**

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**For additional information, please contact Corey Meunier, Chair**  
**School of Technology & Skilled Trades**  
**(705) 759-2554, Ext. 2610**

**I. COURSE DESCRIPTION:**

Upon successful completion of Instrumentation –3.05, the apprentice is able to: describe the use and list the requirements for instrumentation air supplies: explain the terminology of instrumentation systems: describe the operation and application of proportional 3-15 psi pneumatic systems: connect and adjust pneumatic control valves to I/P: calibrate typical pneumatic valves: 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.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

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

- Explain the principles of measured variable vs controlled variable,
- Feed back, open loop vs. closed loop, transducers
- Describe the use of and list requirements for instrumentation air supplies.
- Describe the construction and application of mechanical and electrical operated valves
- Identify the ISA and European symbols used for pneumatic control devices
- Describe the theory of operation and the typical application of proportional 3-15 psi pneumatic instrumentation systems
- Calibrate typical pneumatic valves
- Explain the operation and application of typical position measurement devices found in industry including shaft encoders, resolvers, proximity switches, LVDTs, and synchros
- Explain the principles of PID control
- Connect and test PID controlled process to demonstrate the effects of varying P,I and D.
- Revise and explain control loops on instrumentation drawings using ISA standards

**III. TOPICS:**

1. CONTROL ELEMENTS
2. PID TUNING
3. TYPES OF CONTROLS
4. PNEUMATIC SYSTEMS
5. VALVES
6. ISA AND EUROPEAN STANDARDS

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

Industrial Control Electronics: Devices, Systems & Applications  
by Bartlet

**V. EVALUATION PROCESS/GRADING SYSTEM:**

**Theory Tests and quizzes= 50%**

**Labs – 50% -**

The following semester grades will be assigned to students:

<b>Grade</b>	<b><u>Definition</u></b>	<i>Grade Point Equivalent</i>
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.	

**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.

