SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE:	Fluid Power		
CODE NO. :	ELR826	**SEMESTER:**	
PROGRAM:	Industrial Electrician Apprenticeship Level III		
AUTHOR:	Frank Musso		
DATE:	March 2017	**PREVIOUS OUTLINE DATED:**	March 2016
APPROVED:	**Corey Meunier** **CHAIR**		**March 2017**
TOTAL CREDITS:	3		
PREREQUISITE(S):			
HOURS/WEEK:	3 hours per week		

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I. COURSE DESCRIPTION:

This course introduces the basic principles of fluid mechanics and the application of these principles to practical and applied problems. After completing this course the student should have a firm foundation in the area of Instrumentation, Process Control and fluid systems.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Perform unit conversions

Potential Elements of the Performance:

- Define the terms fluids and fluid mechanics
- Define units of force, energy and pressure in SI and English systems of units
- Perform unit conversions and calculations

2. Define, express and relate the properties of fluids and its laws

Potential Elements of the Performance:

- Pascal's Law – force/area/pressure
- Bernoulli's Law
- Gauge/atmospheric pressures
- Velocity characteristics
- Discuss aeration, cavitation, pump flow

3. Describe basic uses of fluids/gases through Hydraulic/pneumatic systems

Potential Elements of the Performance:

- Understand the functions of fluids in systems
- Be knowledgeable of the various types of fluids used and why
- Understand basic fluid conditioning monitoring needed
- Discuss proper filtering methods and ratings used today
- Discuss proper testing methods available

4. Be knowledgeable in the safety measures used in fluid systems
Such as hydraulics and pneumatics

Potential Elements of the Performance:

- List proper safety measures to be used when servicing hydraulic/
- Pneumatic systems
- Understand how to adjust valves using safe practices
- Be able to safely replace components on any system using safe work habits
- Understand safe lock out practices for systems
- Understand the dangers involved in various types of high pressure hydraulics

5. Understand basic system components

Potential Elements of the Performance:

- Reservoirs
- Pumps/Compressors
- Filters
- Directional valves
- Relief valves
- Pressure valves
- Actuators
- Accumulators and other system accessories
- Understand the operation of single and double acting cylinders

6. Identify factors affecting fluid flow and compute the head loss in
a fluid flow system

Potential Elements of the Performance:

- Characterize laminar and turbulent flow
- Understand frictional head loss
- Understand losses due to expansion, contraction and fittings
- Be able to select sizes and types of hydraulic piping

III. TOPICS:

1. Safety measures
2. Terms and symbols units
3. Fluid Properties
4. Safety Measures
5. Components
6. Lab activities

IV. EVALUATION PROCESS/GRADING SYSTEM:

Grading - Written Tests - **70%**
Quizzes, labs, assignments, attendance - **20%**
Assignments, attendance, & attitude **– 10%**
100%

Students who will be absent for a scheduled test must contact instructor in advance. Students absent without prior notification and a valid reason will be given a zero grade for the missed test.

Quizzes – quizzes can be held without notice, throughout the semester. Students who are absent, will receive a zero grade for that quiz

The following semester grades will be assigned to students:

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.

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.