



# COURSE OUTLINE

## ELR826

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<b>Course Code: Title</b>	ELR826: FLUID POWER
<b>Program Number: Name</b>	
<b>Department:</b>	ELEC. APPRENTICES
<b>Semester/Term:</b>	18W
<b>Course Description:</b>	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.
<b>Total Credits:</b>	3
<b>Hours/Week:</b>	3
<b>Total Hours:</b>	0
<b>Course Evaluation:</b>	Passing Grade: 50%, D
<b>Other Course Evaluation &amp; Assessment Requirements:</b>	<p>Grading - Witten Tests - 70%                      Quizzes, labs, assignments, attendance - 20%                      Assignments, attendance, &amp; attitude - 10%                      100%</p> <p>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.</p> <p>Quizzes - quizzes can be held without notice, throughout the semester. Students who are absent, will receive a zero grade for that quiz</p> <p>The following semester grades will be assigned to students:</p> <p>Grade                      Definition                      A+ 90 - 100%                      A 80 - 89%                      B 70 - 79%                      C 60 - 69%</p>

D 50 - 59%  
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W Student has withdrawn from the course without academic penalty.

**Course Outcomes and Learning Objectives:**

**Course Outcome 1.**

Perform unit conversions.

**Learning Objectives 1.**

- 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

**Course Outcome 2.**

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

**Learning Objectives 2.**

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

**Course Outcome 3.**

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

**Learning Objectives 3.**

- 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

**Course Outcome 4.**

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

## **Learning Objectives 4.**

- 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

## **Course Outcome 5.**

Understand basic system components.

## **Learning Objectives 5.**

- 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

## **Course Outcome 6.**

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

## **Learning Objectives 6.**

- 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

**Date:**

Thursday, March 1, 2018

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