



Course Details:

- Course Title:** Automation and fluid control Lab (0640531), Fifth year
- Prerequisite:** Pneumatic and Hydraulic system (0640435)
- Credit Hours:** 1 credit hours (16 weeks per semester, approximately 44 contact hours).
- Class Time:** Section 1; Sun (13:10-16:00) and Section 2; Mon (8:15-11:00).
- Textbook:** Laboratory notes and manual
- References:**
- Fluid Power Hydraulics Fundamentals Student Manual 30794-00.
 - Fluid Power Electrical Control of Pneumatic Systems, Student Manual 31300-00.
 - Fluid Power Pneumatics Fundamentals, Student Manual 31290-00.
 - Fluid Power Electrical Control of Hydraulic Systems, Student Manual 31228-00.

- Course Description:**
1. Understand the basic principles of pneumatics systems.
 2. Define the relationship between flow rate, velocity, and power.
 3. Introduced the basic types of Pneumatic and hydraulic circuits, Identification and operation of basic Pneumatic and hydraulic components.
 4. Design an electrical circuits and ladder diagrams for pneumatic and Hydraulic applications.

Website: <http://www.philadelphia.edu.jo/academics/waraydah/page.php?id=3>

Instructor: **Name: Eng. Walaa S. Araydah**
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Office hours: Sun, Tues, Thurs: 11:15-1:15

Course Outlines:

Week	Topic	
1	Introduction to pneumatic and Hydraulic systems	
2	Pneumatic	Pneumatic Pressure vs. Force Relationship
		Pressure drop vs. Flow Relationship
3	Hydraulic	Pressure limitation
		Pressure vs. Force Relationship
4	Pneumatic	Directional Control Valve of pneumatic system
		Directional and Speed Control of Cylinders
5	Hydraulic	Flow rate and velocity
6	Indirect Control Using Pilot-Operated Valves	

7	Basic Electrically Controlled Pneumatic Circuits
8	Basic Memory and Priority Electro-pneumatic Circuits
9	Basic Electrically Controlled Hydraulic Circuits
10	Counter Electro-Pneumatic Applications
11	Hydraulic Sequencing of Cylinders
12	Pneumatic Application using PLC (200)

Course Learning Outcomes with reference to ABET Student Outcomes:

Upon successful completion of this course, student should:

1.	Understand the principle of pneumatic and hydraulic energy and their controlled applications.	[a, b, c,d , k]
2.	Understand the basic principle of Pneumatic and hydraulic systems.	[a, b, c, d, k]
3.	To implement electrical circuit and ladder diagram using PLC to control the pneumatic and hydraulic systems.	[a, b, c, d, k]
4.	Realize how to deal with some practical problems and how to solve it	[a, b, c, d, k]

Assessment Guidance:

Evaluation of the student performance during the semester (total final mark) will be conducted according to the following activities:

Quizzes: (3-5) quizzes of (10-15) minutes will be conducted during the semester. The materials of the quizzes are set by the lecturer.

Reports: 11 report.

Final Exam: The students will undergo a scheduled final exam at the end of the semester covering the whole materials taught in the course.

Grading policy:

First Exam	"Quizzes (5%), reports (15%) " 20%
Second Exam	"Quizzes (5%), reports (15%) " 20%
Third Exam	"Quizzes (5%), reports (10%) and performances (5%) " 20%
Final Exam	"Practical 30% and Theoretical 10% " 40%
Total: 100%	

Attendance Regulation:

The semester has in total 45 credit hours. Total absence hours from classes must not exceed 15% of the total credit hours. Exceeding this limit without a medical or emergency excuse approved by the deanship will prohibit the student from sitting the final exam and a zero mark will be recorded for the course. If the excuse is approved by the deanship the student will be considered withdrawn from the course.

October, 2019