



**Philadelphia University**  
**Faculty of Engineering, Department of Mechatronics Engineering**  
**Course Syllabus**

## Course Details:

**Course Title:** Automation and fluid control Lab (0640531)

**Prerequisite:** Pneumatic and Hydraulic system (0640435)

**Credit Hours:** 1 credit hours (14 weeks first semester, approximately 28 contact hours)

**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:** **Email:** waraydah@philadelphia.edu.jo  
**Office:** Engineering building, Mechatronics Department, room 64212, ext: 2591.  
**Office hours:** Sun, Mon, 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	

<b>11</b>	Hydraulic Sequencing of Cylinders
<b>12</b>	Pneumatic Application using PLC (200)
<b>13</b>	Free lab
<b>14</b>	<b>Final Exam</b>

## Course Learning Outcomes with reference to ABET Student Outcomes:

Upon successful completion of this course, student should:

1.	Understand the basic principles and components of pneumatic and hydraulic systems and their applications.	[1]
2.	Ability to implement traditional control circuit and ladder diagram using PLC in pneumatic and hydraulic systems.	[6]

### 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:

Reports	40%
Quizzes	20%
Final Exam	40%
Total:	100%

### Attendance Regulation:

The semester has in total 28 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.