The University of Jordan
School of Engineering
Department of Mechatronics Engineering
first semester 2025-2026

Course:	Hydraulic and pneumatic systems lab 0908447 (1 Cr.)
Instructor:	Eng. Safaa Al-Wreadat *Office: Mechatronics Engineering Department, Basement Floor* *Email* : **fpe.lab.engsafaa@gmail.com**
Course Website:	`https://elearning.ju.edu.jo/`
Catalog Data:	1 Credit hours. The course aims to provide students with a solid understanding of the principles, and concepts used in the analysis of hydraulic and pneumatic fluid power systems and the skills needed to design control and operation of those systems with competitive levels of efficiency, safety and environmental footprint. Learn how to analyze fluid power components and circuits, and how to design and simulate fluid power circuits for applications. In this course, you will be introduced to the fluid power components, circuits, and systems. You will learn the sym bols of common hydraulic components; and how to design and predict the performance of fluid power circuits.
Prerequisites by Course:	Hydraulic and pneumatic systems .
Textbook :	Hydraulic and pneumatic lab Handout
References:	• Notes and slides on the ELearning JU webspace.
Schedule & Duration:	16 Weeks, 16 Labs (180 minutes each) plus exams.
Instructional Methods	1. Pre-lab 2. Conducting experiemtns (Lab Work)
Material:	Lab Handouts , and an access to Personal Computer with FluidSim/Automation Studio
Minimum College Facilities:	Lab with whiteboard and projection display facilities, and computational facilities with FluidSim/Automation Studio.
Course Outcomes:	1. Identify the basic components of fluid power systems, their operational principles and performance characteristic's [2]. 2. Design and construct fluid power circuits to satisfy certain functions, taking into consideration the aspects of efficiency, economy, safety and noise [6.2]. 3. Select fluid power circuit components and size them to satisfy given operational, safety and reliability constraints [2] 4. Analyze fluid power circuits, and to predict their performance, efficiency and safety [2]

ABET SO:

1- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

2- An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

3- An ability to communicate effectively with a range of audiences

4- An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

5- An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

6- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

7- An ability to acquire and apply new knowledge as needed, using appropriate learning strategie

Course Topics:

	Topic Description
1.	Experiment 1: Introduction to FluidSIM or Automation studio Program
2.	Experiment 2 : Pneumatic Control of a Double-acting Cylinder
3.	Experiment 3 : Electro pneumatics Control Technology
4.	Experiment 4 : Introduction to Hydraulic Trainer
5.	Experiment 5 : Sequential control of a 2 double acting cylinder
6.	Experiment 6:Electro pneumatics Sequential control of a 2 double acting cylinder
7.	**(Mid term exam week)**
8.	Experiment : Regenerative and Parallel Circuits
9.	Experiment 8 :Pneumatic sequential control of a 3 double acting cylinder
10.	Experiment 9 : Electro pneumatic sequential control of a 3 double acting cylinder
11.	**(practical exam)**

Ground Rules:

- **Attendance:**

Students are expected to attend EVERY CLASS SESSION and they are responsible for all material, announcements, schedule changes, etc., discussed in class. The university policy regarding the attendance will be strictly adhered to.

- **Make up Examinations**

There will be no makeup exams for any exam that will be taken during the course. exceptions to this rule is restricted only to the following cases:-

1. Death of only first order relatives (father, mother, sister, or brother).
2. Hospital entry (in-patient) during thr time of the examination.

Any other cases will be given the zero mark in the corresponding exam.

Assessments:

Pre Lab, In Lab work , (computerized / practical) exam, and final exam

Grading policy:

Pre Lab	**10%**
In Lab Work	**10%**
Midterm Exam	**30%**
Computerized/ Practical Exam	**10%**
Final Exam	**40%**
Total	**100 %**

Last Updated:

Feb 2025