



Hashemite University
College of Engineering
Department of Mechatronics
Corse 110405511- Pneumatic and Hydraulic Systems
(3 Credit Hours)

Instructor

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Office hours:	

Grading info

Mid	30
HW+Quizes	30
Final	40

Class Info

Days	S T Th
Time	8:00-9:00
Location	MS Teams

Course

Course Number:	110405511
Prerequisite:	Automatic Control 110405331
Textbook:	Esposito, Anthony, Fluid Power with Applications, 7th Ed, Prentice Hall
Course Description (as in the catalog):	The aim of the course is to acquire the necessary technical information related to pneumatic and hydraulic drives technology .The course includes: Pneumatic and hydraulic drives components with their specifications and functions such as Pneumatic and hydraulic sources, pneumatic actuators pneumatic and hydraulic control elements, different kinds of valves, pneumatic and hydraulic symbols. Calculation relationships. Proportional and servo- valves. Design of hydraulic and pneumatic drives.
Specific Outcomes of Instruction (Course Outcomes):	<ul style="list-style-type: none"> • Learn the basics of fluid power systems, their usage, advantages, and disadvantages. • Learn about the different hydraulic fluids • Realize the environmental impact for Hydraulic oils and the alternatives. • Apply basic fluid calculations, using Pascal’s and Bernoulli’s equations • Learn about the different component of the fluid power system and their application, pumps, valves, motors, and cylinders. • Design a simple fluid power circuit. • Analyze a fluid power circuit.
Important material	Automation Studio ®

References: Automation Studio Help Files, Course Handouts

Major Topics Covered and Schedule in Weeks:

Topic	# Weeks	# Contact hours
Introduction to fluid power systems	1	3
Basic fluid properties	2,3	5
Power calculation of a fluid power system	3,4,5	6
Losses in a hydraulic system	6,7	4
Pumps, types and calculations	8	3
Cylinders	9	3
Hydraulic Motors	10	3
Valves, DCV, PCV, FCV	11,12	6
Design and analysis of a fluid power system	13,14	6
Pneumatic and Air preparation	15	3
Total	15	45

Course Policy

- A
- B
- C

Student Outcomes (SO) Addressed by the Course:

#	<i>Outcome Description</i>	<i>Contribution</i>
(a)	an ability to apply knowledge of mathematics, science, and engineering	<i>H</i>
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	<i>H</i>
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	<i>M</i>
(f)	an understanding of professional and ethical responsibility	<i>L</i>
(g)	an ability to communicate effectively	
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	<i>L</i>
(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	<i>L</i>

H=High, M= Medium, L=Low