



**Jordan University of Science and Technology**  
**Faculty of Engineering**  
**Mechanical Engineering Department**

ME541 Fluid Power Control - JNQF Level: 7

Second Semester 2023-2024

**Course Catalog**

3 Credit Hours. 3 Credit Hours. Introducing the concept of Fluid Power Control and how it compares to other power systems. Fluid properties, mechanics and governing laws. Pumps, actuators and physical phenomenon related to them. Discussion of valves. Exposing the students to fundamentals and specific cases of control valves such as Direction, Pressure and Flow control valves. Emphasizing on the design and control of hydraulic and pneumatic circuits

**Teaching Method:** On Campus

**Text Book**

<b>Title</b>	Fluid Power Engineering by
<b>Author(s)</b>	M. Galal Rabie, The McGraw-Hill Companies
<b>Edition</b>	7th Edition
<b>Short Name</b>	Ref #1
<b>Other Information</b>	Class Notes

**Course References**

Short name	Book name	Author(s)	Edition	Other Information
Ref #2	Fluid Power with applications	Anthony Esposito	4th Edition	
Ref #3	Fluid Power Control	Blackburn, J. F., G. Reethof, and J. L. Shearer	1st Edition	
Ref #4	Oil Hydraulic Power and its Industrial Applications	Ernst, W.	1st Edition	

**Instructor**

Name	<b>Prof. Ghassan Tashtoush</b>
Office Location	M5 L2

Office Hours	
Email	gtash@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Mon, Wed : 13:00 - 14:30 Room: C2006

Prerequisites		
Line Number	Course Name	Prerequisite Type
254621	ME462 Automatic Control	Prerequisite / Study
253431	ME343 Fluid Mechanics	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	Introduction to hydraulics and pneumatics	From Ref #1
Week 2	Fluids for hydraulic systems	From Ref #1
Week 3	Distribution systems and their components	From Ref #1
Weeks 4, 5, 6	Pumps, classifications and properties	From Ref #1
Weeks 7, 8	Actuators	From Ref #1
Weeks 9, 10, 11	Valves	From Ref #1
Week 12	Circuits analysis and design	From Ref #1
Weeks 13, 14, 15	Pneumatic systems	From Ref #1
Week 16	Fluid logic control systems	From Ref #1

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Demonstrate a good understanding of the basic components of hydraulic systems, and the ability to choose appropriate fluids and distribution components based on desired application [2SO1, 1SO7] [1L7K1]	20%	
Describe the different designs of hydraulic pumps and their displacement correlations and perform calculations that involves volumetric and mechanical efficiencies of hydraulic pumps [1SO1, 1SO7] [1L7S1, 1L7S2]	14%	
Describe the different designs of hydraulic actuators and their displacement correlations and perform calculations that involves volumetric and mechanical efficiencies of hydraulic actuators [1SO1, 1SO7] [1L7C1, 1L7C2]	13%	

Demonstrate a good understanding of the working principles of directional control valves, pressure control valves and flow control valves and perform basic analysis and design of hydraulic circuits [1SO1, 1SO2, 1SO7] [1L7S3, 1L7C1]	33%	
Demonstrate a good understanding of the basic components of pneumatic systems and perform basic analysis and design of pneumatic circuits [1SO1, 1SO2, 1SO7] [1L7C4]	12%	
Demonstrate a good understanding of fluid logic control and their components in a fluid power system [1SO1, 1SO7] [1L7C4]	8%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
45.83	15					39.17

Relationship to NQF Outcomes (Out of 100%)						
L7K1	L7S1	L7S2	L7S3	L7C1	L7C2	L7C4
20	7	7	16.5	23	6.5	20

Evaluation	
Assessment Tool	Weight
First Exam	30%
Second Exam	30%
Final examination	40%

Date Printed: 2024-02-26