FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

Faculty of Engineering & Technology

Fluid Systems Control

Information :

Course Code :	MPR 479	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours

Department : Specialization of Mechatronics Engineering

Instructor Information :

Title	Name	Office hours
Professor	Abdelaziz Morgan Abdelaziz Ahmed	9
Assistant Lecturer	Moustafa Raafat Aziz Shousha	
Assistant Lecturer	Rana Mohamed Abdel Rahman Saleh	8

Area Of Study :

This courseaims to:
Enrich the student's basic theoretical knowledge about the pneumatic and hydraulic control systems.
Train students to build a sequential control system based on pneumatic and hydraulic components.

Description :

Basic characteristics, analysis and design of hydraulic and pneumatic Systems; Control devices; Directional, pressure and flow control valves; Motion control:
pneumatic, hydraulic and electro-mechanical actuation systems; Pneumatic and hydraulic motors; Pneumatics and electro-pneumatics circuits; Fans and compressors;
Power transmission and power amplification Sequence diagram; Applied circuits for direct and indirect control.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Describe different components of pneumatic and hydraulic systems.
2 -	Select the appropriate components for a specific control operation.
3 -	Explain the sequence of operations according to the sequence diagram.
4 -	Identify different electro-pneumatic components.
b.Intellectual Skills: :	
1 -	Evaluate the performance of different types of pump used in hydraulic systems.
2 -	Analyze various sequential control circuits according to the sequence diagram using the available software.
3 -	Develop the ladder diagram of the PLC for a certain application.
c.Professional and Practical Skills: :	
1 -	Construct the hydraulic and pneumatic circuits for a certain application.

2 -	Analyze the motion of the actuating cylinders during the experiments of sequential control applications.
d.General and Transferable Skills: :	
1 -	Work coherently and successfully as a part of a team in assignments
2 -	Write reports in accordance with the standard scientific guidelines.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction to hydraulics and pneumatics : essential components for both circuits	4	2	2
Actuating cylinders	2	2	0
Directional valves	9	6	3
Pressure control valves	4	3	1
Flow control valves	4	3	1
Memory and delay circuits	6	2	4
Sequence diagram	5	3	2
Electro-pneumatics	21	12	9
Applications to mechanical and electrical circuits	3	3	0

Teaching And Learning Methodologies :

Interactive Lecturing
Problem solving
Experiential learning

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments, Participation	20.00		
Final Exam	40.00	16	
First Midterm Exam	15.00	5	
Quizzes	10.00		
Second Midterm Exam	15.00	10	

Recommended books :

Andrew Parr ñHydraulics and Pneumatics A technician's and engineer's guideò, Butterworth-Heinemann, Second editions, 2006.
Bolton, W; ñMechatronics: Electronic Control Systems in Mechanical and Electrical Engineeringò, Pearson; 6 edition, 2016