

Office of The Principal  
Government Polytechnic, Jashpur

District- jashpur (Chhattisgarh) – 496338

Website-www.gpjashpur.ac.in, E-mail: govtpolyjashpur@gmail.com

**LESSON PLAN SESSION JUL – DEC 2023**

SUBJECT: **FLUID POWER ENGINEERING** SEMESTER: **5<sup>TH</sup>**

BRANCH: - **MECHANICAL ENGINEERING**

UNIT NUMBER	NAME OF THE TOPIC	NO OF CLASS REQUIRED	REMARK
<b>Unit 01:</b> Introduction to Fluid Power Systems.	1.1.1 Power transmission modes and comparison, Fluid Power. Transmission of forces in fluid – Pascal’s law. Factors affecting the fluid flow Application and advantages of fluid power.	02	
	1.2.1 Basic components of a fluid power 1.2.2 ISO Symbols used in Hydraulic & Pneumatic System.	02	
	1.3.1 Hydraulic & Pneumatic system General layout 1.3.2 Symbols used, Applications, Merits, Limitations	02	
	1.4.1 Hydraulic Fluids-Function and properties, Types, ISO and SAE grades of oils, Selection of hydraulic fluids.	01	
<b>Unit 02:</b> Elements of Hydraulic Systems.	2.1.1 Pumps: Classification of pumps, Comparison of positive & non-positive Displacement pumps. 2.1.2 Construction and working of Gear , vane, Screw, piston pumps Performance characteristics and Selection of pumps	03	
	2.2.1 Actuators and it’s Classification, Construction and working of hydraulic actuators, Linear and rotary actuators (Motors) used For hydraulic applications.	02	
	2.3.1 Direction control valves- Check valve, 2/2, 3/2, 4/2, 4/3, 5/2, 5/3, D.C. Valves used in Hydraulics. 2.3.2 Pressure control valves- relief, unloading, sequence, counterbalance, pressure reducing valves	03	
	2.4.1 Flow control valves- Non compensated, Pressure and temperature compensated	02	
<b>Unit 03:</b> Oil Hydraulic Circuits	3.1.1 Control of single and Double acting Hydraulic cylinders. 3.1.2 Speed control double acting cylinder -Meter in, Meter-out, Bleed Off circuit.	02	
	3.2.1 Unloading circuits, Regenerative circuits, Counterbalance valve & circuit, 3.2.2 Speed control of bidirectional hydraulic motor, braking and replenishing of hydraulic motor, synchronizing circuits, Sequencing Circuits.	03	
	3.3.1 Applications, ISO Symbols used in hydraulic circuits. 3.3.2 Hydraulic circuits for Milling machine and Shaper machine. 3.3.3 Common troubles in hydraulic systems, their causes and remedies	03	
<b>Unit 04:</b> Elements of Pneumatic Systems	4.1.1 Air Compressors –Recall Types, construction & working of Reciprocating & Rotary compressors, Selection of compressor 4.1.2 Air treatment-Air receiver, Moisture separator and Air dryer, FRL unit, Pressure regulator.	02	
	4.2.1 Pneumatic actuators- Single & double Acting cylinders. 4.2.2 Air Motors -Vane, Georotor, Turbine and Piston motor. Electrical Actuators for pneumatic systems. Comparison between Air, Hydraulic and Electric actuators.	03	

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	4.3.1 Pneumatic Direction control valves - 2/2,3/2,4/2,4/3,5/2,5/3, 4.3.2 Pressure control valves- relief, unloading, sequence, counterbalance, pressure reducing valves.	03	
	4.4.1 Flow control valves- None compensated, Pressure and temperature compensated, Dual (twin) pressure valve, Shuttle valve, Quick exhaust valve, Time delay valve	02	
Unit 05: Pneumatic Circuits	5.1 Direct/Indirect Control of single and Double acting Air cylinders 5.2 Actuation of Pneumatic motor (Air Motor)	02	
	5.3 Speed control of double acting cylinder and Bidirectional Air motor. 5.4 Sequencing circuits 5.5 Time delay operation.	02	
	5.6 Hydro-pneumatic applications Air-Oil reservoir, Air-Oil cylinder, Air-Oil Intensifier 5.8 Pneumatic sensors, Common troubles in pneumatic systems, their causes and remedies.	02	
Total Class Required		41	

  
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