GOVERNMENT CO-ED POLYTECHNIC RAIPUR (C.G)
DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Session: JUL-DEC 2024 | Session start as per university calendar:

Course Name: Fluid Power Engineering | Course code : 2037575(037)

Name of Subject Teacher: MR. HEMSAGAR GUPTA | Lecturer plan Theory = 80

Discipline: Mechanical	Semester: 5th					
Lecture No.	**Unit No.**	**Topic to be covered under this unit**	**Total hours**	**Planned Date**	**Execution Date**	**Remarks if any**
1	Introduction to Fluid Power Systems	1.1 Power transmission modes and their comparison,	14	22/08/24	22/08/24	
2		Transmission of forces in fluid – Pascal's law		22/08/24	22/08/24	
3		Multiplication of forces		22/08/24	22/08/24	
4		Factors affecting the fluid flow – gravity, atmospheric pressure, applied forces, inertia & friction,		23/08/24	23/08/24	
5		Application and advantages of fluid power.		24/08/24	24/08/24	
6		1.2 Basic components of a fluid power system – Reservoir or Receiver, Pump or compressor, Piping, tubing or hose,		24/8/24	24/08/24	
7		Directional control valve and Actuating device.		26/08/24	27/08/24	
8		ISO Symbols used in Hydraulic & Pneumatic system.		27/08/24	27/08/24	
9		1.3 Oil, Hydraulic & Pneumatic systems: General layout, symbols used		27/08/24	29/08/24	
10		Oil, Hydraulic & Pneumatic systems: General layout, symbols used		29/08/24	29/08/24	

11		Applications, Merits, Limitations.		29/08/24	29/08/24	
12		1.4 Hydraulic Fluids-Functions and properties		29/08/24	05/09/24	
13		Types, ISO and SAE grades of oils		30/08/24	05/09/24	
14		Selection of hydraulic fluids.		02/09/24	05/09/24	
15		2.1 Pumps: Classification of pumps		05/09/24	07/09/24	
16		Comparison of positive (Hydrodynamic) & non-positive displacement (Hydrostatic) pumps		05/09/24	07/09/24	
17		Construction and working of Gear , vane, Screw, piston pumps(axial and radial),		05/09/24	09/09/24	
18		Performance characteristics and Selection of pumps		06/09/24	10/09/24	
19		2.2 Actuators:Classification of actuators		09/09/24	10/09/24	
20		Construction and working of hydraulic actuators		10/09/24	12/09/24	
21		Linear and rotary actuators (Motors) used for hydraulic applications.		10/09/24	12/09/24	
22	Elements of Hydraulic Systems	2.3 Control Valves for hydraulic system:Classification-Direction control valves-Check valve, 2/2,3/2,4/2,4/3,5/2,5/3,D.C.	15	12/09/24	12/09/24	
23		2.3 Control Valves for hydraulic system:Classification-Direction control valves-Check valve, 2/2,3/2,4/2,4/3,5/2,5/3,D.C.		12/09/24	13/09/24	
24		Valves used in Hydraulics, Standard centre positions		12/09/24	14/09/24	
25		Methods of actuation		13/09/24	14/09/24	
26		Pressure control valves- relief, unloading, sequence, counterbalance, pressure reducing valves		16/09/24	17/09/24	

27		2.4 Flow control valves- Non compensated, Pressure and temperature compensated		19/09/24	17/09/24	
28		2.5 Seals, Filters, Pipes, Hoses, Reservoirs,		19/09/24	19/09/24	
29		2.6 Accumulators and Pressure intensifiers.		19/09/24	19/09/24	
30	Oil Hydraulic Circuits	3.1 Control of single and Double acting Hydraulic cylinders.	18	20/09/24	19/09/24	
31		Control of single and Double acting Hydraulic cylinders.		23/09/24	20/09/24	
32		Control of single and Double acting Hydraulic cylinders.		26/09/24	21/09/24	
33		3.2 Speed control double acting cylinder - Meter-in		26/09/24	21/09/24	
34		Meter-out		26/09/24	24/09/24	
35		Bleed Off circuit.		27/09/24	24/09/24	
36		3.3 Unloading circuits		28/09/24	26/09/24	
37		Regenerative circuits		28/09/24	26/09/24	
38		Counterbalance valve & circuit		30/09/24	26/09/24	
39		speed control of bidirectional hydraulic motor		01/10/24	27/09/24	
40		braking and replenishing of hydraulic motor		01/10/24	28/09/24	
41		synchronizing circuits		03/10/24	28/09/24	
42		Sequencing Circuits.		03/10/24	30/09/24	
43		3.4 Applications,ISO Symbols used in hydraulic circuits.		03/10/24	01/10/24	
44		3.5 Hydraulic circuits for Milling machine		04/10/24	01/10/24	
45		Hydraulic circuits for Shaper machine		05/10/24	03/10/24	
46		3.6 Common troubles in hydraulic systems, their causes and remedies.		05/10/24	03/10/24	

47		Common troubles in hydraulic systems, their causes and remedies.		07/10/24	03/10/24	
48		4.1 Air Compressors –Recall Types,		08/10/24	04/10/24	
49		construction & working of Reciprocating compressors		08/10/24	05/10/24	
50		construction & working Rotary compressors		10/10/24	05/10/24	
51		Selection of compressor.		10/10/24	07/10/24	
52		4.2 Air treatment-Air receiver, Moisture separator and Air dryer,		10/10/24	08/10/24	
53		FRL unit, Pressure regulator		11/10/24	08/10/24	
54		4.3 Pneumatic actuators: Pneumatic Cylinders		14/10/24	10/10/24	
55		Single & double acting cylinders		19/10/24	10/10/24	
56		Air Motors – Vane, Georotor,		19/10/24	10/10/24	
57		Turbine and Piston motor		21/10/24	14/10/24	
58		Electrical actuators for pneumatic systems		22/10/24	19/10/24	
59		Comparison between Air, Hydraulic and Electric actuators.		22/10/24	19/10/24	
60	Elements of Pneumatic Systems	4.4 Pneumatic control valves: Classification-Direction control valves - 2/2,3/2,4/2,4/3,5/2,5/3	15	24/10/24	22/10/24	
61		Pneumatic control valves: Classification-Direction control valves - 2/2,3/2,4/2,4/3,5/2,5/3		24/10/24	22/10/24	
62		Pressure control valves- relief, unloading, sequence,		24/10/24	24/10/24	
63		counterbalance, pressure reducing valves,		25/10/24	24/10/24	
64		Flow control valves- Non compensated, Pressure and temperature compensated,		28/10/24	24/10/24	
65		Dual (twin)pressure valve, Shuttle valve, Quick exhaust valve, Time delay valve.		31/10/24	25/10/24	

	4.5 Accessories: Pipes, hoses, fittings, Seals and gaskets, Accumulators, heat exchanger, muffler.		01/11/24	08/11/24	
	Accessories: Pipes, hoses, fittings, Seals and gaskets, Accumulators, heat exchanger, muffler.		04/11/24	09/11/24	
Pneumatic Circuits	5.1 Direct/Indirect Control of single and Double acting Air cylinders.	18	07/11/24	09/11/24	
	Direct/Indirect Control of single and Double acting Air cylinders.		07/11/24	11/11/24	
	Direct/Indirect Control of single and Double acting Air cylinders.		07/11/24	14/11/24	
	5.2 Actuation of Pneumatic motor (Air Motor)		08/11/24	14/11/24	
	5.3 Speed control of double acting cylinder and Bi-directional Air motor.		11/11/24	14/11/24	
	Speed control of double acting cylinder and Bi-directional Air motor.		14/14/24	16/11/24	
	5.4 Sequencing circuits.		14/11/24	16/11/24	
	5.5 Time delay operation.		14/11/24	25/11/24	
	5.6 Hydro-pneumatic applications Air-Oil reservoir		15/11/24	26/11/24	
	Air-Oil cylinder, Air-Oil Intensifier.		18/11/24	26/11/24	
	5.7 Pneumatic sensors.		21/11/24	28/11/24	
	5.8 Common troubles in pneumatic systems, their causes and remedies.		21/11/24	28/11/24	
	Common troubles in pneumatic systems, their causes and remedies.		22/11/24	28/11/24	

HOD

Principal
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