

GOVERNMENT POLYTECHNIC GARIYABAND

GARIYABAND (C.G.)

LESSON PLAN

SESSION - JULY-DEC 2024

NAME OF FACULTY : Prakash Vibhor Baghel

COURSE : Diploma in Engineering

SUBJECT :- Fluid Power Engineering

DESIGNATION : Lecturer (Mechanical)

DEPARTMENT : Mechanical Engineering

COURSE CODE :

SEMESTER : V

2037575(037)

SESSION STARTS FROM : 20/08/2024

TOTAL CLASS PER WEEK:- 03

Unit No.	Lecture No.	Topics to be covered	Planned Date	Execution Date	Remark
1	1	Unit1.0 Introduction to Fluid Power Systems Power transmission modes and their comparison, Concept of Fluid Power, Transmission of forces in fluid – Pascal's law, multiplication of forces,	20/08/2024	20/08/2024	
	2	Factors affecting the fluid flow – gravity, atmospheric pressure, applied forces, inertia & friction, Application and advantages of fluid power.	22/08/2024	22/08/2024	
	3	Tutorial Class	24/08/2024	24/08/2024	
	4	Basic components of a fluid power system – Reservoir or Receiver, Pump or compressor, Piping, tubing or hose,	27/08/2024	27/08/2024	
	5	Directional control valve and Actuating device. ISO Symbols used in Hydraulic & Pneumatic system.	29/08/2024	29/08/2024	
	6	Tutorial Class	31/08/2024	31/08/2024	
	7	Oil, Hydraulic & Pneumatic systems: General layout, symbols used, Applications, Merits, Limitations.	03/09/2024	03/09/2024	
	8	Hydraulic Fluids-Functions and properties, Types, ISO and SAE grades of oils, Selection of hydraulic fluids	05/09/2024	05/09/2024	
	9	Tutorial Class	07/09/2024	07/09/2024	

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Unit No.	Lecture No.	Topics to be covered	Planned Date	Execution Date	Remark
2	10	Unit2.0 Elements of Hydraulic Systems Pumps: Classification of pumps, Comparison of positive (Hydrodynamic) & non-positive displacement (Hydrostatic) pumps,	10/09/2024	10/09/24	
	11	Construction and working of Gear, vane, Screw pumps	12/09/2024	12/09/24	
	12	Tutorial Class	14/09/2024	13/09/24	
	13	Construction and working of piston pumps(axial and radial), Performance characteristics and Selection of pumps	17/09/2024	14/09/24	
	14	Actuators: Classification of actuators, Construction and working of hydraulic actuators,	19/09/2024	19/09/24	
	15	Tutorial Class	21/09/2024	18/09/24	
	16	Linear and rotary actuators (Motors) used for hydraulic applications. Control Valves for hydraulic system: Classification-Direction control valves- Check valve, 2/2,3/2,4/2,4/3,5/2,5/3,	24/09/2024	24.09.24	
	17	D.C. Valves used in Hydraulics, Standard centre positions, Methods of actuation,	26/09/2024	24.09.24	
	18	Tutorial Class	28/09/2024	26.09.24	
	19	Pressure control valves-relief, unloading, sequence, counter balance, pressure reducing valves	01/10/2024	28.09.24	
	20	Flow control valves- Non compensated, Pressure and temperature compensated Seals, Filters, Pipes, Hoses, Reservoirs, Accumulators and Pressure Intensifiers.	03/10/2024	01/10/24	
21	Tutorial Class	05/10/2024	03/10/24		

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Unit No.	Lecture No.	Topics to be covered	Planned Date	Execution Date	Remark
3	22	Unit3.0 Oil Hydraulic Circuits Control of single and Double acting Hydraulic cylinders.	08/10/2024	04.10.24	
	23	Speed control double acting cylinder-Meter-in, Meter-out, Bleed Off circuit	10/10/2024	05.10.24	
	24	Tutorial Class	15/10/2024	08.10.24	
	25	Unloading circuits, Regenerative circuits, Counter balance valve & circuit,	17/10/2024	10.10.24	
	26	speed control of bidirectional hydraulic motor, braking and replenishing of hydraulic motor,	19/10/2024	15.10.24	
	27	Tutorial Class	22/10/2024	19.10.24	
	28	Synchronizing circuits, Sequencing Circuits.	24/10/2024	22.10.24	
	29	Applications, ISO Symbols used in hydraulic circuits.	26/10/2024	24.10.24	
	30	Tutorial Class	05/11/2024	26.10.24	
	31	Hydraulic circuits for Milling machine and Shaper machine.	09/11/2024	05.11.24	
	32	Common troubles in hydraulic systems, their Causes and remedies	12/11/2024	08.11.24	
	33	Tutorial Class	14/11/2024	09.11.24	

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Unit No.	Lecture No.	Topics to be covered	Planned Date	Execution Date	Remark
4	34	Unit4.0 Elements of Pneumatic Systems Air Compressors–Recall Types, construction & working of Reciprocating & Rotary compressors, Selection of compressor.	16/11/2024	17/11/24	
	35	Air treatment-Air receiver, Moisture separator and Air dryer, FRL unit, Pressure regulator.	19/11/2024	16/11/24	
	36	Tutorial Class	21/11/2024	19/11/24	
	37	Pneumatic actuators: Pneumatic Cylinders - Single & double acting cylinders, Air Motors –Vane, Gear motor, Turbine and Piston motor.	23/11/2024	21/11/24	
	38	Electrical actuators for pneumatic systems, comparison between Air, Hydraulic and Electric actuators.	26/11/2024	22/11/24	
	39	Tutorial Class	28/11/2024	23/11/24	
	40	Pneumatic control valves: Classification-Direction controlvalves- 2/2,3/2,4/2,4/3,5/2,5/3, Pressure control valves- relief, unloading, sequence, counter balance, pressure reducing valves,	30/11/2024	29/11/24	
	41	Flow control valves- Non compensated, Pressure and temperature compensated, Dual (twin) pressure valve, Shuttle valve, Quick exhaust valve, Time delay valve. Accessories: Pipes, hoses, fittings, Seals and gaskets, Accumulators, heat exchanger, muffler.	03/12/2024	30/11/24	
	42	Tutorial Class	05/12/2024	11/12/24	

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Unit No.	Lecture No.	Topics to be covered	Planned Date	Execution Date	Remark
5	43	Units.0 Pneumatic Circuits Direct/Indirect Control of single and Double acting Air cylinders, Actuation of Pneumatic motor (Air Motor)	07/12/2024	12/12/2024	
	44	Speed control of double acting cylinder and Bi-directional Air motor. operation.	10/12/2024		
	45	Tutorial Class	12/12/2024		
	46	Sequencing circuits, Time delay, Hydro-pneumatic applications Air-Oil reservoir, Air-Oil cylinder, Air-Oil Intensifier,	14/12/2024		
	47	Pneumatic sensors, Common troubles in pneumatic systems, their causes and remedies	17/12/2024		
	48	Tutorial Class	19/12/2024		

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