GOVT. POLYTECHNIC SUNDER NAGAR

LESSON PLAN : FLUID MECHANICS & HYDRAULIC MACHINERY **(SESSION: AUGUST-DEC. 2025)**

MECHANICAL ENGINEERING (SEMESTER - 5TH)

S.NO.	MONTH	WEEK	DATE	CONTENT (THEORY)	REMARKS
1	AUG.	1st	NIL	**UNIT-I**	
		2nd	4,5,8,9	Properties of fluid : Density, Specific gravity, Specific Weight, Specific Volume, Dynamic Viscosity, Kinematic Viscosity, Surface tension, Capillarity, Vapour Pressure, Compressibility.	9(HOLIDAY)
		3rd	11,12,15,16	Fluid Pressure & Pressure Measurement: Fluid pressure, Pressure head, Pressure intensity, Concept of	15,16(HOLIDAY)
		4th	18,19,22,23	vacuum and gauge pressures, atmospheric pressure, absolute pressure, Simple and differential manometers,	
		5th	25,26,29,30	Bourdan pressure gauge, (Simple problems on Manometers only).	
2	SEPT.	1st	1,2,5,6	**Unit-II:**	
		2nd	8,9,12,13	Fluid Flow: Types of fluid flows, Path line and Stream line, Continuity equation, Bernoulli's theorem for ideal fluid, Principle of operation of Venturimeter, Orifice meter and Pitot tube, Derivations for discharge,	13(HOLIDAY)
		3rd	15,16,19,20	coefficient of discharge and simple numerical problems.	
		4th	22,23,26,27	Flow Through Pipes: Laminar and turbulent flows; Darcy's equation and Chezy's equation for frictional losses (Formula for the above terms withoutproof), Minor losses in pipes, Hydraulic gradient and total	
		5th	29,30	gradient line, Simple Numerical problems to estimate losses only.	
3	OCT.	1st	3,4	**Unit-III:**	
		2nd	6,7,10,11	Impact of jets: Impact of jet on fixed vertical, moving vertical flat plates, Impact of jet on curved vanes with special reference to turbines , Simple Numerical on work done and efficiency.	7,11(HOLIDAY)
		3rd	13,14,17,18		
		4th	20,21,24,25	**Unit-IV:**	20(HOLIDAY)
		5th	27,28,31	Hydraulic Turbines: Layout of hydroelectric power plant, Features of Hydro electric power plant, Classification of hydraulic turbines, Selection of turbine on the basis of head and discharge available,	
4	NOV.	1st	1	Construction and working principle of Pelton wheel, Francis and Kaplan turbines, Draft tubes – types and construction, Concept of cavitation in turbines, Calculation of Work done, Power, efficiency of turbines, Unit	
		2nd	3,4,7,8	quantities (Formula only) and simple numerical.	8(HOLIDAY)
		3rd	10,11,14,15	**Unit-V:**	
		4th	17,18,21,22	Centrifugal Pumps (Problems omitted): Principle of working and applications, Types of casings and impellers, Concept of multistage, Concept of Priming and, Cavitation, Manometric head, Work done,	
		5th	24,25	Manometric efficiency, Overall efficiency. Reciprocating Pumps (Problems omitted): Construction, working principle and applications of single and double acting reciprocating pumps, Concept of Slip, Negative slip, Cavitation and separation.	

31/8/2025

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(Lect. Mech. Engg.)

HOD (ME) 01/8/2025

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S.NO.	MONTH	WEEK	DATE	CONTENT (PRACTICAL) GROUP-I	REMARKS
1	AUG.	1st	NIL	.....	
		2nd	6	Measurement of pressure head by employing. i) Piezometer tube ii) U- tube manometer iii) Differential U- tube Manometer.	
		3rd	13	Measurement of pressure head by employing. i) Piezometer tube ii) U- tube manometer iii) Differential U- tube Manometer.	
		4th	20	Verification of Bernoulli's theorem.	
		5th	27	Determination of Coefficient of Discharge of Venturimeter.	
2	SEPT.	1st	3	Determination of Coefficient of Discharge, coefficient of contraction and coefficient ofvelocity of Orifice meter	
		2nd	10	Determination of coefficient of friction of flow through pipes.	
		3rd	17	Determination of minor losses of flow through pipes.	
		4th	24	Calibration of pressure gauge using dead weight pressure gauge tester.	
		5th	NIL	.....	
3	OCT.	1st	1	Conduct performance test on centrifugal pump.	
		2nd	8	Study a single acting reciprocating pump.	
		3rd	15	Study of Pelton wheel and Francis/Kaplanturbinewith the help of models.	
		4th	22	Study of Pelton wheel and Francis/Kaplanturbine with the help of models.	
		5th	29	REPEAT IF ANY	
4	NOV.	1st	NIL	.....	
		2nd	5	REPEAT IF ANY	5(HOLIDAY)
		3rd	12	REPEAT IF ANY	
		4th	19	REPEAT IF ANY	
		5th	26	REPEAT IF ANY	

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MECHANICAL ENGINEERING (SEMESTER - 5TH)

S.NO.	MONTH	WEEK	DATE	CONTENT (PRACTICAL) GROUP-II	REMARKS
1	AUG.	1st	NIL	.....	
		2nd	7	Measurement of pressure head by employing. i) Piezometer tube ii) U- tube manometer iii) Differential U- tube Manometer.	
		3rd	14	Measurement of pressure head by employing. i) Piezometer tube ii) U- tube manometer iii) Differential U- tube Manometer.	
		4th	21	Verification of Bernoulli's theorem.	
		5th	28	Determination of Coefficient of Discharge of Venturimeter.	
2	SEPT.	1st	4	Determination of Coefficient of Discharge, coefficient of contraction and coefficient ofvelocity of Orifice meter	
		2nd	11	Determination of coefficient of friction of flow through pipes.	
		3rd	18	Determination of minor losses of flow through pipes.	
		4th	25	Calibration of pressure gauge using dead weight pressure gauge tester.	
		5th	NIL	.....	
3	OCT.	1st	2	.....	2(HOLIDAY)
		2nd	9	Conduct performance test on centrifugal pump.	
		3rd	16	Study a single acting reciprocating pump.	
		4th	23	Study of Pelton wheel and Francis/Kaplanturbine with the help of models.	
		5th	30	Study of Pelton wheel and Francis/Kaplanturbine with the help of models.	
4	NOV.	1st	NIL	.....	
		2nd	6	REPEAT IF ANY	
		3rd	13	REPEAT IF ANY	
		4th	20	REPEAT IF ANY	

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31/8/25

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LESSON PLAN FOR -THEORY OF MACHINES & MECHANISMS (SESSION :- AUG -DEC 2025)					
MECHANICAL ENGINEERING (SEMESTER - 5th)					
S.NO.	MONTH	WEEK	DATE	DESCRIPTION OF PRACTICAL / JOB	REMARKS
1	AUG	1st	[illegible]	Cams and Followers: Concept; Definition and application of Cams and Followers; Classification of Cams and Followers; Different follower motions and their displacement diagrams like uniform velocity, SHM, uniform acceleration and Retardation	UNIT I
		2nd	[illegible]	Drawing of profile of radial cam with knife-edge and roller follower without offset for reciprocating motion (graphical method for uniform velocity and SHM only).	
		3rd	[illegible]		
		4th	[illegible]	Power Transmission (Derivations omitted): Types of Drives: Belt Drives - flat belt, V– belt & its applications; Material for flat and V-belt; Angle of lap, Belt length, Slip and Creep	UNIT II
		5th	[illegible]	-----	
2	SEPT	1st	[illegible]	Determination of Velocity Ratio, Ratio of tight side and slack side tension; Centrifugal tension and Initial tension; Condition for maximum power transmission (Formula without proof) (Simple numerical)	
		2nd	[illegible]	Chain Drives–Advantages & Disadvantages; Gear Drives – Spur gear terminology; Types of gears and gear trains; Train value & Velocity ratio for simple and compound gear train	1st Class Test
		3rd	[illegible]	Flywheel and Governors(Problems omitted): Flywheel - Concept, function and application of flywheel with the help of turning moment diagram for single cylinder 4-Stroke I.C. Engine	UNIT III
		4th	[illegible]	Co-efficient of fluctuation of energy, Coefficient of fluctuation of speed and its significance Governors-Types and explanation with neat sketches (Centrifugal, Watt and Porter);	
		5th	[illegible]	Concept, function & Terminology of Governors; Comparison between Flywheel and Governor.	
3	OCT	1st	[illegible]	Brakes, Clutches & Bearings (Problems and derivations omitted): Function of brakes; Types of brakes; Comparison between brakes and dynamometers	UNIT IV
		2nd	[illegible]	Construction and working of i) shoe brake, ii) Band Brake, iii) Disc Brake	
		3rd	[illegible]	Concept of Self Locking & Self energizing brakes	2nd Class Test
		4th	[illegible]	Clutches- Function of Clutch and its application; Construction and working of i)Single plate clutch, ii) Multi plate clutch, iii) Centrifugal Clutch and iv) Cone clutch; Bearings – i) Simple Pivot, ii) Collar Bearing, iii) Conical pivot.	16-18 Diwali Vacation
		5th	[illegible]	Balancing & Vibrations(Problems omitted): Concept of balancing; Balancing of single rotating mass;	UNIT V
4	NOV	1st	[illegible]		
		2nd	[illegible]	House Test	House Test
		3rd	[illegible]	Graphical method for balancing of several masses revolving in same plane	
		4th	[illegible]	Vibrations, its type and concept of damping ;Causes of vibrations in machines; their harmful effects and remedies	
		5th	[illegible]		

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LESSON PLAN : ADVANCED MANUFACTURING PROCESSES (SESSION: AUG.-NOV. 2025)

MECHANICAL ENGINEERING (SEMESTER - 5th)

S.NO.	MONTH	WEEK	DATE	CONTENT (THEORY)	REMARKS
1	AUG.	2nd	4,5,6,7	**UNIT-I: Jigs & Fixtures:** Definition of jig; Types of jigs: Leaf jig, Box and Handle jig, Template jig, Plate jig, Indexing jig, Universal jig, Vice jigs; General consideration in the design of drill jigs; Drill bush; Types of fixtures: Vice fixtures, Milling fixtures, Boring fixtures, Grinding fixtures; Basic principles of location; Locating methods and devices; Basic principles of the clamping; Types of clamps: Strap clamps, Cam clamps, Screw clamps, Toggle clamps, Hydraulic and Pneumatic clamps.	
		3rd	11,12,13,14		
		4th	18,19,20,21		
		5th	25,26,27,28		
2	SEPT.	1st	1,2,3,4	**Unit-II: Plastic Processing:** Processing of plastics; Moulding processes: Injection moulding, Compression moulding, transfer moulding; Extruding; Casting; Fabrication methods-Sheet forming, Blow moulding, Laminating plastics (sheets, rods & tubes),Reinforcing; Applications of Plastics.	
		2nd	8,9,10,11		
		3rd	15,17,18		
		4th	22,23,24,25	**Unit-III: Modern Machining Processes:** Principle, Description and applications of Ultrasonic Machining, Electric Discharge Machining, Wire cut EDM, Abrasive Jet Machining, Laser Beam Machining, Electro Chemical Machining.	
		5th	29,30		
3	OCT.	1st	1		
		2nd	6,8,9		
		3rd	13,14,15	**Unit-IV: CNC Milling Machines:** Vertical and horizontal machining center: Constructional features, Axis identification, Electronic control system. Automatic tool changer and tool magazine. CNC programming: Preparatory functions (G code) , miscellaneous functions (M code), Part programming.	
		4th	21,22,23		
		5th	27,28,29,30		
4	NOV.	1st	1		
		2nd	3,4,6	**Unit-V: Special Purpose Machines (SPM):** Concept, General elements of SPM, Productivity improvement by SPM, Principles of SPM design. Maintenance of Machine Tools: Types of maintenance, Repair cycle analysis, Repair complexity, Maintenance manual, Maintenance records, Housekeeping. Iqntroduction to Total Productive Maintenance(TPM).	
		3rd	10,11,12,13		
		4th	17,18,19,20		
		5th	24,25,26		

Workshop Supdt.

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