NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)

LESSON PLAN

SUBJECT: FLUID MECHANICS AND FLUID POWER(AEPC207-TH:4)

Name of the Faculty- Er.Subhrajyoti Rout

Branch- Automobile Engineering   **Session-** 2025-26

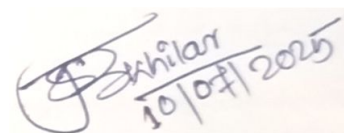**Semester-** 3rd   **Examination-** 2025 (W)

CHAPTER WISE DISTRIBUTION OF PERIODS

Unit	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
I	PROPERTIES OF A FLUID AND HYDROSTATICS	9	12
II	KINEMATICS AND DYNAMICS OF FLUID MECHANICS	6	9
III	FLOW THROUGH ORIFICES AND NOTCHES, PIPES	9	11
IV	Turbines and Pumps	12	15
V	FLUID POWER	9	13
	Total	**45**	**60**

sign of the faculty   Sign of H.O.D

Name of the programme: Diploma in AUTOMOBIL	Semester: 3rd	Name of the Teaching Faculty: Er.Subhrajyoti Rout	
		Academic Year : 2025-26	Examination : 2025 (W)
Course Code: AEPC207 TH:4	Course Year: Second Year	No. of Classes Alloted Per Week :	4
		Planned Classes Required to Complete the Course	60
Week	Class Day	Topics to be Covered	
1st	1st	**PROPERTIES OF A FLUID AND HYDROSTATICS**:Definition of a fluid, classification of fluids	
	2nd	various fluid properties such as density, specific weight, specific gravity	
	3rd	viscosity and surface tension and state the units, fluid pressure, total pressure (hydrostatic force) and location of centre of pressure on vertical, horizontal	
	4th	viscosity and surface tension and state the units, fluid pressure, total pressure (hydrostatic force) and location of centre of pressure on vertical, horizontal	
2nd	1st	inclined and curved surfaces by fluid, working of various measuring devices for pressure	
	2nd	the principle of manometers of simple, differential and inverted types, principle of buoyancy and floatation.	
	3rd	the principle of manometers of simple, differential and inverted types, principle of buoyancy and floatation.	
	4th	Simple numericals on Manometer	
3rd	1st	Simple numericals on Manometer	
	2nd	**KINEMATICS AND DYNAMICS OF FLUID MECHANICS:** Various types of flow, circulation and vorticity, stream-line	
	3rd	path line and streak-line, various energies of fluid, law of conservation of mass	
	4th	energy equation -Bernoulli's theorem	
4th	1st	the limitations of same-application of Bernoulli's equation	
	2nd	the working of venturimeter, pitot tube, equation of flow rate and velocity with respect to venturimeter	
	3rd	pitot tube respectively, the working of flowmeter: current meter, Simple numericals.	
	4th	**FLOW THROUGH ORIFICES AND NOTCHES, PIPES:Definition** –orifice,orifice coefficient such as Cc, Cv, Cd	
5th	1st	Relationship between orifice coefficients, weir and notch, Discharge over rectangular notch and weir	
	2nd	Triangular notch. Simple numericals.	

Week	Class Day	Topics to be Covered
5th	3rd	triangular notch. Simple numericals.
	4th	Definition of a pipe. laws of fluid friction, Equation of loss of head through pipe due to friction
6th	1st	fluid friction, Equation of loss of head through pipe due to friction, Darcy's formula and Chezy's formula, hydraulic gradient and total energy line
	2nd	fluid friction, Equation of loss of head through pipe due to friction, Darcy's formula and Chezy's formula, hydraulic gradient and total energy line
	3rd	Nozzle and its application, Power transmission through nozzle the condition of maximum power transmission through nozzle
	4th	Nozzle and its application, Power transmission through nozzle the condition of maximum power transmission through nozzle
7th	1st	Expression for diameter of nozzle for maximum power transmission
	2nd	Expression for diameter of nozzle for maximum power transmission
	3rd	**Turbines and Pumps::** Classification of hydraulic turbines
	4th	Selection of turbine on the basis of head and discharge available
8th	1st	Selection of turbine on the basis of head and discharge available
	2nd	Construction and working principle of Pelton wheel
	3rd	Construction and working principle of Pelton wheel
	4th	Francis and Kaplan turbines. Draft tubes – types and construction, Concept of cavitation in turbines
9th	1st	Francis and Kaplan turbines. Draft tubes – types and construction, Concept of cavitation in turbines
	2nd	Calculation of Work done, Power, efficiency of turbines. Simple numerical
	3rd	Calculation of Work done, Power, efficiency of turbines. Simple numerical
	4th	Calculation of Work done, Power, efficiency of turbines. Simple numerical
10th	1st	Calculation of Work done, Power, efficiency of turbines. Simple numerical
	2nd	**Centrifugal Pumps:** Principle of working and applications
	3rd	**Centrifugal Pumps:** Principle of working and applications
	4th	**Centrifugal Pumps:** Principle of working and applications
11th	1st	Types of casings and impellers, Concept of multistage, Priming and its methods
	2nd	Types of casings and impellers, Concept of multistage, Priming and its methods
	3rd	Manometric head, Work done, Manometric efficiency, Overall efficiency. Simple numericals

Week	Class Day	Topics to be Covered
11th	4th	Manometric head, Work done, Manometric efficiency, Overall efficiency. Simple numericals
12th	1st	Manometric head, Work done, Manometric efficiency, Overall efficiency. Simple numericals
	2nd	Manometric head, Work done, Manometric efficiency, Overall efficiency. Simple numericals
	3rd	**Reciprocating Pumps:** Construction, working principle and applications of single and double acting reciprocating pumps
	4th	**Reciprocating Pumps:** Construction, working principle and applications of single and double acting reciprocating pumps
13th	1st	**Reciprocating Pumps:** Construction, working principle and applications of single and double acting reciprocating pumps
	2nd	Concept of Slip, Negative slip, Cavitation and separation. Simple numericals
	3rd	Concept of Slip, Negative slip, Cavitation and separation. Simple numericals
	4th	Concept of Slip, Negative slip, Cavitation and separation. Simple numericals
14th	1st	**FLUID POWER**: Definition of fluid power, classification
	2nd	FLUID POWER: Definition of fluid power, classification
	3rd	hydraulic power and pneumatic power, Hydraulic Systems -Basic principle of enclosed hydraulic system
	4th	hydraulic power and pneumatic power, Hydraulic Systems -Basic principle of enclosed hydraulic system
15th	1st	Pascal's law, Oil hydraulic system – reservoir, filter pressure limiting valves, direction control valves
	2nd	Pascal's law, Oil hydraulic system – reservoir, filter pressure limiting valves, direction control valves
	3rd	flow control valves, actuators (linear and rotary), accumulator
	4th	hydraulic circuits - extension and retraction of linear actuator, motion of rotary actuator, holding a job, hydraulic press etc.

sign of the faculty   **Sign of H.O.D**