

LESSON PLAN

Semester: 4TH		Year: 2ND	Course: B.Tech
		Sub: FLUID DYNAMICS	Total Credit:03
Branch : CE		Sub Code : CIPC2005	
Name of the Faculty:		BAL GOPAL GURU	
Designation :		Assistant Professor	
Department :		Civil Engineering	
Session		2024-25	
Recommended Books		Text book:	
		1. S. K. Som and G. Biswas, Fluid Mechanics and Fluid Machines, Tata. McGraw Hill Publishing Company	
		2. P. N. Modi and S. M. Seth, Hydraulic and Fluid Mechanics, Standard Book House, New Delhi	
		Reference Books:	
		1. R. K. Bansal, Fluid Mechanics and Hyd. Machines, Laxmi publisher, New Delhi	
		2. A.K. Jain, , Fluid Mechanics Khanna Publishers	
Sl. No.	Lecture No.	Topics to be covered	No. of Classes
MODULE-1			
1	Lecture-01	Introduction OF Boundary Layer Theory	11
2	Lecture-02	Thickness of boundary layer, boundary layer along a long thin plate and its characteristics	
3	Lecture-03	Boundary layer equations, momentum integral equations of the boundary layer	
4	Lecture-04	Laminar boundary layer, turbulent boundary layer, laminar sub-layer,	
5	Lecture-05	Boundary layer on rough surfaces, separation of boundary layer	
6	Lecture-06	Methods of controlling the boundary layer.	
7	Lecture-07	Introduction, Types of Drag	
8	Lecture-08	Dimensional analysis of drag and lift, drag on a(sphere, cylinder, flat plate and air foil),	
9	Lecture-09	Effect of free surface on drag, effect of compressibility on drag,	
10	Lecture-10	Development of lift on immersed body, induced drag on an air foil, of finite length	
11	Lecture-11	Polar diagram for lift and drag of an air foil.	
MODULE-2			
12	Lecture-12	Introduction to momentum equation	8
13	Lecture-13	Impulse momentum equation, momentum correction factor,	
14	Lecture-14	Application of impulse momentum equation	
15	Lecture-15	Force on a pipe bed, jet propulsion (orifice tank, ship), momentum theory of propellers	
16	Lecture-16	Angular momentum principle	
17	Lecture-17	Introduction to impact of free jets.	
18	Lecture-18	Force exerted by fluid jets on (stationary flat plate, moving flat plate, stationary curved vane, moving curved vane)	
19	Lecture-19	Torque exerted on a wheel with radial curved vane	
MODULE-3			
20	Lecture-20	Introduction, main components, types of reciprocating pumps	
21	Lecture-21	work done (single acting and double acting),coefficient of discharge, slip, percentage slip and negative slip	
22	Lecture-22	effects of acceleration of piston on velocity and pressure in suction and delivery pipes	
23	Lecture-23	indicator diagram, operating characteristic curves	
24	Lecture-24	Introduction,advantages,component parts,working,types of centrifugal pumps	
25	Lecture-25	work done by theimpeller,head,losses and efficiencies,minimum starting speed, loss of head due to reduced orincreased flow,diameter of impeller and pipes,specific speed	
26	Lecture-26	characteristic curves, cavitation,priming devices, troubles and remedies	
27	Lecture-27	Introduction,elements of hydraulic power plant,head and efficiencies of hydraulic turbine	
28	Lecture-28	classification.	

29	Lecture-29	Pelton wheel: work done and efficiencies,working proportions	10
30	Lecture-30	design of runner, multiple jetwheel.	
31	Lecture-31	reaction turbine, Francis turbine	
32	Lecture-32	work done and efficiencies, working proportions,	
33	Lecture-33	, design of runner, draft tube theory,	
34	Lecture-34	Kaplan turbine, workingproportions, Expression for specific speed in terms of known coefficients for different turbines,performance characteristic curves.	
35	Lecture-35	Classification, reaction, impulse, outward flow, inward flow & mixed flow turbines, Francis& Kaplan turbines	
36	Lecture-36	Pelton Wheel, Physical description and principle of operation	12
37	Lecture-37	Governingof turbine	
MODULE-4			
38	Lecture-38	Uniform flow in open channels	
39	Lecture-39	types, geometrical properties, velocitydistribution, uniform flow	
40	Lecture-40	most economical section	
41	Lecture-41	computation of uniform flow, specificenergy and critical depth	
42	Lecture-42	specific force, critical flow and its computation, application ofspecific energy to channel transitions	
43	Lecture-43	Non-uniform flow in open channel: Introduction, gradually varied flow	
44	Lecture-44	classification ofcannel bottom slopes, classification of surface profiles	
45	Lecture-45	characteristics of surface profiles,integration of varied flow equations, hydraulic jump	
46	Lecture-46	location of hydraulic jump, surges inopen channel	
47	Lecture-47	Flow over notches and weirs: Introduction, classification	
48	Lecture-48	sharp-crested weir, rectangularweir, triangular weir, trapezoidal weir, broad-crested weir.	
49	Lecture-49	Measurement of depth of flow: point gauge, hook gauge, float gauge	

Signature of Faculty Member

Signature of HOD

PRINCIPAL