

# Department of Civil Engineering

II B.Tech IISEM,2015-16(A)

## LESSON PLAN

### HYDRAULICS AND HYDRAULIC MACHINERY

B.ESWARA RAO

period	date	unit	Topic	Teaching methodology	Cumulative periods
5,6	21.12.15	1	Introduction of the chapter and its importance and applications, Dimensions, Dimensional Homogeneity	CT	2
3,4	22.12.15	1	Methods of dimensional analysis – Rayleigh method	CT	4
5,6	28.12.15	1	Buckingham $\pi$ –method, Number of dimensionless groups in a complete set of variables	CT	6
3,4	29.12.15	1	Superfluous and omitted variables.	CT	8
5,6	04.01.16	2	Open channel flow, Introduction and applications, Types of flows - Type of channels, Velocity distribution – Energy and momentum correction factors	CT	10
3,4	05.01.16	2	Chezy's, Manning's; and Bazin formulae for uniform flow	CT	12
5,6	11.01.16	2	Most Economical sections, Critical flow: Specific energy	CT	14
5,6	18.01.16	2	critical depth, computation of critical depth – critical sub-critical and super critical flows	CT	16
3,4	19.01.16	2	Non uniform flow-Dynamic equation for G.V.F., Mild	CT	18
5,6	25.01.16	2	Critical, Steep, horizontal and adverse slopes, surface profiles-direct step method, Rapidly varied flow	CT	20
5,6	01.02.16	2	Hydraulic jump, energy dissipation	CT	22
3,4	02.02.16	3	Basics of turbo machinery, Hydrodynamic force of jets on stationary flat	CT	24
5,6	08.02.16	3	Inclined and curved vanes, jet striking centrally and at tip	CT	26
3,4	09.02.16	3	Velocity triangles at inlet and outlet, expressions for work done, efficiency	CT	28
5,6	15.02.16	3	Angular momentum principle, Applications to radial flow turbines	CT	30
3,4	16.02.16	4	Hydraulic Turbine, Layout of a typical Hydropower installation – Heads and efficiencies	Demonstration at lab	32
5,6	22.02.16	4	classification of turbines pelton wheel-	CT	34



			Francis turbine		
3,4	23.02.16	4	Kaplan turbine-working, working proportions	CT	36
5,6	29.02.16	4	velocity diagram, work done and efficiency, hydraulic design	CT	38
3,4	01.03.16	4	Draft tube – theory and function efficiency	CT	40
5,6	07.03.16	4	Governing of turbines-surge tanks	CT	42
3,4	08.03.16	4	specific turbines-unit speed-unit quantity-unit power-specific speed	CT	44
5,6	14.03.16	4	specific turbines-unit speed-unit quantity-unit power-specific speed	CT	46
3,4	15.03.16	4	Geometric similarity, cavitations	CT	48
5,6	21.03.16	5	Centrifugal pump, Pump installation details-classification	CT	50
3,4	22.03.16	5	work done, Manometric head-minimum starting speed losses and efficiencies	CT	52
5,6	28.03.16	5	specific speed multistage pumps-pumps in parallel	CT	54
3,4	29.03.16	5	Characteristic curves	CT	56
5,6	04.04.16	5	Pumps in parallel, performance of pumps	CT	58
5,6	11.04.16	5	NPSH- Cavitation	CT	60
3,4	12.04.16	5	Tutorial	CT	62

NOTE: C.R- Class Room Teaching (Black board, PPT)



Signature