

20CE4601C- HYDROPOWER ENGINEERING

Course Category:	Professional Elective	Credits:	3												
Course Type:	Theory	Lecture-Tutorial- Practical:	3-0-0												
Prerequisites:	20CE3301 - Mechanics of Fluids	Continuous Evaluation:	30												
	20CE3301 - Applied mechanics	Semester End Evaluation:	70												
	20CE3403 - Hydraulics & Hydraulic machines 20BS1104 - Applied physics	Total Marks:	100												
Upon successful completion of the course, the student will be able to:															
Course Outcomes	CO1	Differentiate various power plants	K2												
	CO2	Calculate the efficiency of hydro power plants	K3												
	CO3	Understand the requirements and components of power plants	K2												
	CO4	Understand the problems involved in the water supply to the plants	K2												
	CO5	Know the advantages and components of the power house	K2												
Contribution of Course Outcomes towards achievement of Program Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	CO1	2	2		2								1	2	2
	CO2	2	2		2								2	1	2
	CO3	3	3		1								1	2	2
	CO4	2	2		2								2	1	2
	CO5	2	2		2								2	1	2
	2	2		2								2	2	2	
	1- Low			2-Medium						3-High					
Course Content															
Unit-1	Pumped Storage Power Plant: Classification of Hydropower Plants – Advantages of Pumped storage plants – Reversible Pump turbines – Power duration curves – Problems of operation – Numerical Problems.													CO1	
Unit-2	Electrical Load on Hydraulic Turbines: Load curve – Load factor – Power factor – Capacity factor– Utilization factor - Load duration curve – Firm power and Secondary power – Numerical Problems.													CO2	
Unit-3	Penstocks and Accessories: Classification of Penstocks – Design criteria for Penstocks – Economical Diameter of Penstocks – Anchor Blocks – Conduit Valves.													CO3	
Unit-4	Water Hammer and Surge: Water Hammer – Resonance in Penstocks – Channel Surges – Surge Tanks.													CO4	
Unit-5	Planning of Power Houses: Power house Structure – Types of Underground Power Stations – Advantages and Components of Underground Power house – Types of Layout.													CO5	
Learning Resources															
Text Books	<ol style="list-style-type: none"> M.M.Dandekar and K.N.Sharma, Water Power Engineering, Vikas Publications, New Delhi. P.N. Modi and S.M. Seth, Hydraulics and Fluid Mechanics and Hydraulic Machines, Standard Book House, Delhi 														
Reference Books	<ol style="list-style-type: none"> A.K. Jain, Fluid Mechanics, 12/e, Khanna publishers, Delhi Rajput .R.K, “Fluid Mechanics and Hydraulic Machines”, S.Chand and Company Ltd M. Franck White, Fluid Mechanics, Tata McGraw Hill, 2017. K. Subramanya, Theory and Applications of Fluid Mechanics, Tata McGraw Hill, 2001. 														
e- Resources & other digital material	<ol style="list-style-type: none"> http://www.digimat.in/nptel/courses/video/108105058/L10.html https://nptel.ac.in/content/storage2/courses/108108078/pdf/chap5/teach_slides05.pdf 														