

K L UNIVERSITY
WATER POWER ENGINEERING (11 – CE 343)

Pre – requisite: 11 - CE 304

Syllabus

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Water Power Engineering

General – Conventional Source of Energy, Status of Electrical Power in the World and India, Advantages and dis-advantages of hydro-electric power over other conventional sources, Place of hydropower in the power system, Investigation and studies for hydro power development. Estimation of Water Power Potential – Mass Curve, Flow Duration Curve, Firm Power & Secondary Power, Power Duration Curve (Available Power) Power Plant Economics – Types, Factors affecting outline design, Useful Life, Connected Load, Maximum Demand, Demand Factor, Load Factor, Load Curve, Base & Peak Load, Plant Capacity Factor, Plant Use Factor, Diversity Factor, Economic Load Sharing between Base Load & Peak Load Power Stations., Cost of Electrical Energy, Energy Rates (Tariff) **Hydro-electric Power Plant:** Classification of Hydro-electric Power Plants – Run-off -River Plant, Valley Dam Plant, Diversion Canal Plant, High Head Diversion Plant – General Arrangements & Different Layouts Storage and Pondage, Pondage Factor Pumped Storage Plants – Essential Requirements, Necessity, Advantages. Problems in Operation, Layout and Principles of power generation - components of power plant – Single and two basin systems – Turbines for tidal power - Estimation of energy – Maximum and minimum power ranges **Water Conveyance System** Types of intakes – Low pressure and High pressure intakes – losses in intakes – low pressure conduit – classification of penstocks – design criteria for penstocks – Economic diameter of penstocks – anchor blocks – conduit valves – types of valves, bends and manifolds, Water hammer analysis-Variou methods., **Power House:** Surge tanks – types – design principles of surge tanks ,Types of powerhouse – surface power house – underground powerhouse – relative advantages - components of powerhouse. **Tidal Power** Basic principale, Lacation of tidal plant, Double basin system, modes of generation, construction aspects. Estimate the Energy and power.

TEXT BOOKS:

1. Water Power Engineering: Barrows, Tata Mc. Graw Hill Co., New Delhi
2. A text Book of Water Power Engineering R.K.Sharma & T.K.Sharma, S. Chand.
3. Hydroelectric Hand Books: Creager and Justin, John Willey & Sons, New

REFERENCE BOOKS:

1. Water Power Engineering: M.M.Dandekar, K.N. Sharma, Vikas Publishing House Pvt., Ltd.,
2. Water Resources- Environment Planning & development by A.K. Bisws, Tata Mc Graw Hill.
3. Irrigation Engineering and Hydraulic structures by S. K. Garg; Khanna Publishers, Delhi