

Hydropower Structures

Course Name	Hydropower Structures
Course Name as on Certificate	Hydropower Structures
Certificate Type	Certificate of Completion by IITM Pravartak and L&T EduTech
Certificate Issued by	IIT MADRAS and L&T EduTech
Course Objectives	<p><u>Course Overview</u> This unique course on Hydropower Structures which provides, insight into hydropower engineering, hydropower projects in India and the components of hydropower structures. The course content includes investigation of the geological and hydrological parameters in developing hydropower projects. Headworks, intake structures, spillways, water conducting system, and other miscellaneous structures in hydropower projects are explained in detail in the course. The hydraulic and structural design are worked out for various components of real-time hydropower projects. The course briefs of embankment dams (earth and rockfill dams). The logistic planning and site infrastructure development, construction methods and planning of headworks, underground works, powerhouse and shaft are discussed. This course will help the learners to develop as a hydropower engineer to build the durable and economical hydropower structures.</p> <p><u>Course Objectives</u></p> <ul style="list-style-type: none"> • To comprehend the components of hydropower structures and their Structural Behavior • To decide the hydropower scheme and workout the hydraulic and Structural design of suitable headworks • To work out the hydraulic design of river diversion scheme as per the site characteristics • To carryout hydraulic and structural design of Barrage, Intake structure, Head race tunnel, Pressure pipes etc
Eligibility	Students pursuing Diploma/ UG /PG Programs in Civil Engineering
Pre Requisites	Fluid Mechanics and Machinery , Applied Hydraulics
Target Segment	Students pursuing Diploma/ UG / PG Programs in Civil Engineering Faculties / Working Professionals in the above domain & other aspiring learners

Course Content	See Enclosed Programme details – as Annexure 1		
Pedagogy	Online Self paced E-Learning Content		
Assessment	One Final Assessment		
Programme Faculty	L&T Industry Experts		
Duration	Units : 5 Hours : 28		
Class Schedule	Self-Paced		
Programme Highlights/USPs	<ul style="list-style-type: none"> • Hydropower projects • Storage Headwork • Diversion Headwork • Diversion Structures • Intake Structures • Water Conducting System • Energy dissipators • Hydraulic and Structural design of components • Tunnels, Cavern • Hydro and Electromechanical components • Construction methods and planning 		
Programme Faculty	<p>Ashutosh Mohod Engineering Manager at L&T Construction's Hydel EDRC</p> <p>With an M.Tech in Structural Engineering from NIT Jamshedpur, he specializes in the design of various civil structures. Notably, he has presented a paper on "BUCKLING ANALYSIS OF COMPOSITE LAMINATED PLATE" at the Structural Engineering Convention 2014 held at IIT Chennai. Ashutosh's expertise and dedication make him a valuable asset in the realm of civil engineering, particularly in hydel projects</p>		
Total Fees		Total Fees (Rs.)	
	Total Programme Fee	Rs 5,100/- inclusive of tax	

ANNEXURE 1

Proposed Course outline / programme / plan – Unit wise syllabus details.

Unit – I : Hydropower Engineering

Introduction – History of hydropower Engineering – Hydropower projects --Headworks and classification - Components – Diversion structures – Intake Structures – Water Conducting System – Power house

Hydrology – water availability studies, design flood studies, flood routing, sediment transport, head loss through water conductor system, assessment of power potential, Geology and Geotechnical Investigation

Unit – II : - Headworks

Storage headwork - diversion Headwork – components – overflow section – non-overflow section – energy dissipators – river training works – cross drainage works

Hydraulic design of dams, barrage, desilting basin

Unit – III : Hydraulic and Structural Design

River Diversion Scheme – structural analysis – Hydraulic design of coffer dam

Power Intake Structures – Hydraulic design, stability and structural analysis

Head Race Tunnel – Structural Design, Surge Shaft – Hydraulic and Structural Design

Pressure shaft, Head Race Tunnel - Structural Design

Unit - IV : Tunnels, Cavern, Power House

Tunnels and Cavern - Overview - Types of Tunneling- Ventilation- Lighting - Mucking & hauling – Safety, Power House - Components - Design steps and data collection – Design loads – Stability Analysis and Design, Miscellaneous structure in hydropower projects

Unit – V : Hydro and Electromechanical components and Construction methods and planning

Hydromechanical Components - Hydro-mechanical equipment - Introduction - Types of gates and their selection – Trash rack

Electromechanical components - Main Turbine- Generator Equipment - Electrical Balance of Plant (eBoP)

Equipment - Mechanical Balance of Plant (mBoP) Equipment

Construction methods and planning