

## FOR ENGINEERING DIPLOMA LEVEL CORE SUBJECT

For the branches in Civil, Electrical, Mechanical, Industrial, Agriculture, Environmental, Production, Electric

1. Subject Code: Course Title: Water Resources Engineering

2. Contact Hours: L: T: P:

3. Examination Duration (Hrs.): Theory : Practical :

4. Relative Weightage : CWS PRS MTE ETE  
PRE

5. Credit:

6. Semester:

Autumn

Spring

Both

7. Pre-requisite: NIL

8. Subject Area:

9. Details of Course:

10. Details of Course:

Sl. No.	Particulars	Contact Hours
1.	Government Hydropower policies, environmental issues, SWOT-(Strength weakness opportunity threatening) of hydropower projects, type of clearance required for Hydropower project, master plan, topography, catchments area, types of streams, allotment of site-(Open bid, Mou, Joint venture).	3
2.	Survey & investigation, PFR-(Pre-feasibility report), DPR (Detailed Project Report), Process of development of site (announcement, allotment, clearance, agreement, commissioning).Types of survey- Topographical, metrological, hydrological, ecological, geological. Arial Rainfall Measurement, Type of flow measurement Devices-(Notch, weir, flume), dilution method, and Flow duration curve (important), flood – discharge estimation kripitech formula, dickens formula, English formula, hydrograph, unit hydrograph.	4
3.	Financial institution, SOI Map, Cost / Estimation – wheeling charges, Banking, Moratorium, PPA-(Power purchase agreement), SERC-(State electricity regulatory commission) Hydrological cycle.	2
4.	WATER RESOURCES PLANNING—Water Resources in India, Purpose & Classification of Water Resources Development Projects, Functional Requirements of Multipurpose Projects, Strategies for the Future.	2
5.	HYDROLOGY—Hydrologic Cycle, Precipitation, Runoff, Hydrograph Analysis.	4

Sl. No.	Particulars	Contact Hours
6.	PRECIPITATION & PRECIPITATION LOSSES—Forms & Types of Precipitation, Rainfall in India, Measurement of Rainfall, Design Storm, Evaporation & its Estimation, Reducing Reservoir Evaporation, Evapotranspiration, Interception, Storage in Depression, Infiltration, Watershed Leakage.	5
7.	GROUND WATER—Subsurface Zoning, Water Bearing Material, Aquifers, Steady, unsteady & Ground Water flow. Well Hydraulics, Well Losses, Stream & Seawater Intrusion, Groundwater Investigation.	5
8.	STREAM FLOW—Terminology, Factors Influencing Runoff, Runoff Computation, Runoff Simulation Models, Storage, Discharge Measurements.	4
9.	HYDROGRAPHS—Concepts & Components, Unit Hydrograph, S- Hydrograph, Distribution Graph.	3
10.	DESIGN FLOODS—Introduction, Design Floods, Flood Estimations, Analysis of Regional Flood Frequency.	3
11.	RESERVOIR PLANNING & DAM PLANNING—Investigation, Site Selection, Zones of Storage, Storage Capacity, Sedimentation & Control, Single & Multipurpose Reservoir, Flood Routing. Classification of DAMS, Factors Influencing selection of Dam, Site Selection.	6
12.	SPILLWAYS & DIVERSION HEADWORKS—General, Types, Energy Dissipation, Indian Standards Criteria, Gates, Outlet works. Diversion Headwork Components, Weirs, Khoslas Theory, Silt Control, Site Selection, Effect of Weir on Regime of River.	
13.	WATER POWER ENGINEERING—General, Classifications, Principle Components, Site Selection of Hydro-Power Plants, Turbines Power House, Water Power Potential Assessment, Design of Hydel Channel.	
14.	REMOTE SENSING APPLICATION on WATER RESOURCES—Satellite Imageries, Geo-Investigation, Forest Cover, Weather Forecasting.	4

### Suggested Readings:

- (1) H.R.Arakeri, Donahue, Roy—PRINCIPLES of SOIL CONSERVATION & WATER MANAGEMENT.
- (2) R.K.Sharma—A TEXT BOOK of HYDROLOGY & WATER RESOURCES. (Contd.-next page)
- (3) H.Bower—GROUND WATER HYDROLOGY
- (4) CENTRAL WATER COMMISSION,INDIA—(1988)-WATER SOURCES of INDIA, Publication No.30/88,CWC, New Delhi
- (5) K.R.Karant—GROUND WATER ASSESSMENT DEVELOPMENT & MANAGEMENT
- (5) Indian Institute of Remote.Sensing,.Publications on WATER RESOURCES.
- (6) K.C.Patra—HYDROLOGY & WATER RESOURCES ENGINEERING

