

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

