

WATER RESOURCES ENGINEERING (3-0-0)

Module-I

Precipitation, its Measurement and Analysis: Hydrologic cycle, catchment area and watershed, Rainfall and its characteristics, Rain gauges, Non-Recording and Recording type, Average rainfall over a catchment, Evapo-transpiration, Pan evaporation, Pan coefficient, Infiltration, W-Index and -Index.

Discharge Measurement: Stream gauging, Flow rating curve, Use of current meters for velocity measurement, Dye-dilution method of discharge measurement, Estimation of discharge.

Module-II

Hydrograph: Characteristics of a Run off hydrograph, Unit hydrograph, S-hydrograph, Instantaneous Unit hydrograph, Synthetic Unit hydrograph, Duration Curve, Mass flow hydrograph.

Flood Control: Flood flows, Frequency studies, Statistical analysis for flood prediction, Method of flood control, Flood routing, Reservoir routing and Channel routing, River training works

Module-III

Open Channel Flow: Definition, Uniform flow, Chezy's Kutter's equation, Most economical section, specific energy, critical, subcritical, supercritical flow, Non-uniform flow, Gradual varied flow, Hydraulic jump,

Dock and Harbours: Natural and artificial harbours, Selection of site, study of winds, tides and wave actions, Accretion and denudation, Principle of construction of Breakwaters, Quays and jetties, Dry, Wet and Floating Docks.

Reference Books:

1. Engg. Hydrology by K. Subramanian Tata-McGraw-Hill
2. Hydrology and Water Resources Engineering by K. C. Patra, Narosa Publishing House, New Delhi
3. Dock and Harbours by Srinivasan
4. Hydrology by H.M. Raghunath, New age Int. Publication, New Delhi
5. Hydrology by P.J.R. Reddy, University Science Press, New Delhi