II B.Tech II Sem

15ACE16-HYDROLOGY AND WATER RESOURCES ENGINEERING

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Objective:

To make students understand the various hydrological processes, estimate the surface and ground-water resources of a drainage basin and to estimate the hydrologic extremes i.e. floods and droughts and their management.

UNIT I

Hydrologic Processes

Introduction – Hydrometeorology - Hydrologic cycle - Precipitation and its types - measurements - evaporation, evapotranspiration, infiltration and other abstractions.

UNIT II

Surface Runoff

Drainage basins – hydrologic losses and rainfall excess – hydrograph analysis – unithydrograph – S-curve Synthetic unit hydrograph – Rainfall-runoff models - SCS method – stream flow measurements.

UNIT III

Groundwater

Groundwater concepts – properties and types of aquifer – saturated flow – steady state one dimensional flow – steady state well hydraulics – unsteady groundwater flow – Theis method and Jacobs method – Ground Water Estimation by GEC norms - geophysical exploration -sea water intrusion.

UNIT IV

Reservoir Planning And Management

Single and multipurpose projects – dams – types – fixation of storage capacity – Strategies for reservoir operation – reservoir sedimentation.

UNIT V

Floods And Droughts

Definition of floods and droughts – frequency analysis – flood control measures – Inter basin water transfer – drought indices - drought prone area programme – artificial recharge – rain water harvesting.

Text Books:

1. Subramanya .K. Engineering Hydrology, Tata McGraw Hill, 2003.
2. Raghunath .H.M., Hydrology, Wiley Eastern Ltd., 2004.

References:

1. Linsley, R.K. and Franzini, J.B., Water Resources Engineering, McGraw Hill International Book Company, 2000

2. Ven Te Chow, Maidment, D.R. and Mays, L.W., Applied Hydrology, McGraw Hill International Book Company, 1998.

3. Todd.D.K., Ground Water Hydrology John Wiley and Sons, New York, 2000.