

HYDROLOGY

1. **Introduction:** Hydrological cycle, components of hydrologic cycle, storage, water balance.
2. **Atmospheric Water System and climate:** Characteristics of Atmosphere, Atmospheric circulation patterns, weather systems, water vapour, precipitable water, hydrologic characteristics of climatic regions.
3. **Precipitation:** Precipitation types, measurements, analysis, mean precipitation, Intensity duration frequency (IDF) and depth- area-duration (DAD) analysis.
4. **Hydrologic Abstractions:** Interception and depression storage; Evaporation: Evaporation processes, Influencing factors, wind-temperature-humidity and solar radiation measurement and estimation; Evapotranspiration: measurement and estimation; Infiltration: Infiltration processes, factors affecting infiltration, measurement of infiltration, empirical and analytical models of infiltration.
5. **Hydrometry:** Gauge and discharge sites, site suitability, river stage, flow velocity measurement, discharge measurements, area-velocity method, tracer techniques, stage-discharge relation.
6. **Runoff: Factor** affecting, runoff characteristics of stream, impact of forest type and forest cover on runoff, hydrograph-unit hydrograph, S-hydrograph, IUH, Clark and Nash IUH;flow duration analysis, flow mass analysis, estimation of peak runoff, time-area method of runoff computation.
7. **Frequency Analysis:** Random variables, Probability distribution functions: normal, log-normal, Gumbel, Pearson type-3 uniform distributions; Frequency analysis; Goodness of fit measures.
8. **Groundwater:** Types of aquifers, , ground water recharge, Darcy's Law, Flow and storage parameters, well hydraulics.
9. **Soil and water conservation,** Basics of soil and water conservation, suitability & site selection for different types of water conservation measure, Planning and design of Water conservation and rainwater harvesting measures, soil erosion, sediment yield assessment at watershed scale, impacts of forest fire on hydrologic regime of watershed and water quality.