

CE 304: Hydrology and Water Resources Engineering (3-0-0: 3)

Course objectives: To comprehend basic concepts of the water cycle with detail understanding of various essential components like, precipitation, evaporation/evapotranspiration, overland flow and surface storage and groundwater flow and storage.

Introduction

Hydrology - definition & scope, Hydrologic cycle and its components.

Precipitation

Formation and types, Forms, Measurement, Estimating missing precipitation data, Average precipitation over area, Depth-area-duration analysis, Abstractions from precipitation.

Runoff and Hydrograph

Runoff components, Factor effecting runoff, Hydrograph and its components, Base flow separation, Unit hydrograph–concept, derivation, limitations and use, S-hydrograph, Synthetic unit hydrograph, Instantaneous unit hydrograph.

Floods

Definition, Use of rational method and hydrograph method, Flood routing: reservoir routing and channel routing, Flood frequency analysis.

Ground water hydrology

Occurrence of ground water, Aquifers, Movement of ground water, Darcy's law, Yield from wells for confined and unconfined aquifers, Yield of an open well.

Text Books:

1. Chow, V.T., Maidment, D.R. and Mays, L.W., "Applied Hydrology", McGraw Hill.
2. Subramanya, K., "Engineering hydrology", McGraw Hill.

References:

1. Singh, V.P., "Elementary Hydrology", Prentice Hall.
2. Raghunath, H.M., "Hydrology – Principles, Analysis and Design", Wiley Eastern Ltd.
3. Todd, D.K., "Groundwater Hydrology", John Wiley & Sons.

Expected outcome: The student shall learn the principles and applications of hydrology and water resources systems including different components of hydrologic cycle, groundwater flow and different hydrologic forecasting approaches.
