## CE443 SURFACE WATER HYDROLOGY (3L-0T-0P:3Cr, 3Hr)

Introduction: Hydrologic Cycle, Water Budget Equation, Residence Time, Hydrologic data sources, History of Hydrology, Hydrology in ancient India

Precipitation and Abstraction: Forms of precipitation, Measurement of precipitation, Monsoon in India, Estimation of missing precipitation data, Consistency test, Depth area duration relationships, Frequency of point rainfall, Evaporation, Transpiration, Infiltration, Infiltration Indices

Streamflow measurement: Stage measurement, Velocity measurement, Bed load measurement and suspended load measurement, Indirect methods, Stage-Discharge relationship

Runoff: Runoff, interflow, groundwater flow, Runoff characteristics, SCS-CN Method, Estimating reservoir capacity

Hydrograph: Flood hydrograph, Factors affecting hydrograph, Components of hydrograph, Base flow separation, Unit hydrograph, Method of superimposition, S-curve, Synthetic unit hydrograph, Instantaneous unit hydrograph

Flood Analysis: Rational method, Empirical Formulas, Flood Frequency Analysis, Regional Flood Frequency Analysis, Risk and Reliability

Flood Routing: Reservoir routing, Channel routing, Conceptual model.

## COURSE OUTCOME

1. Apply the knowledge of science to analyse the hydrologic cycle and the various forms of precipitation and abstractions.
2. Identify and analyse precipitation and the runoff characteristics.
3. Design, develop and analyse the componentsof hydrographs using various methods.
4. Apply the knowledge of mathematics and engineering to estimate the magnitude of flood.

## TEXT BOOKS

1. Chow, V. T., Maidment, D. R., Mays, L. W., Applied Hydrology, McGraw Hill, 1988.
2. Haan, C. T., Statistical Methods in Hydrology, Iowa State University Press, 1977.
3. Subramanya, K., Engineering Hydrology, Fifth Edition, McGraw-Hill, 2020.

## REFERENCE BOOKS

1. Mays, L. W., Water Resources Engineering, John Willey and Sons, US, 2001.
2. Viessman, W., and Lewis, G.L., Introduction to Hydrology, Fifth Edition, PHI Learning Private Limited, New Delhi, 2003.
3. Wilfried Brutsaert., Hydrology: An Introduction by, Cambridge University Press, 2012.