

CE 501: Surface Water Hydrology (3-0-0-3)

Course objectives: To develop technical skills for modelling and quantifying hydrological processes. Development of research capabilities so that the students completing the course shall be capable of pursuing further works on water management, integrated water resources management, urban water management, flood control, managing climate change impacts on the water cycle etc.

Introduction

Basic Concepts

Hydrologic Processes

Precipitation, Evaporation, Infiltration, Groundwater and stream flows. Reynolds Transport theorem.

Atmospheric water

Circulation, Water vapor, Precipitable water, Thunderstorm cell model.

Hydrograph analysis

Probability, risk and uncertainty analysis for hydrologic and hydraulic design.

Flood routing

Hydrologic and hydraulic routing - developing algorithms, Hydrologic real time forecasting.

Urban hydrology

Time series analysis.

Text Books and References:

1. Chow, V.T., Maidment, D.R., and Mays, L.W., "*Applied Hydrology*", McGraw Hill.
2. Todd, D.K., "*Ground Water Hydrology*", Wiley.
3. Singh, V.P., "*Elementary Hydrology*", Prentice Hall.
4. Raghunath, H.M., "*Hydrology – Principles, Analysis and Design*", Wiley Eastern Ltd.

Expected outcome: The students shall be able to formulate hydrological processes in mathematical terms; be able to work with and recognise the limitations of hydrological data; be able to employ mathematical and computational techniques to solve real life hydrological problems.
