



# SURFACE WATER HYDROLOGY

**PROF. RAJIB MAITY**

Department of Civil Engineering  
IIT Kharagpur

**TYPE OF COURSE** : New | Core | UG

**COURSE DURATION** : 12 Weeks (24 Jan' 22 - 15 Apr' 22)

**EXAM DATE** : April 23, 2022

**INTENDED AUDIENCE** : Students belonging to Civil Engineering discipline can take this course

**INDUSTRIES APPLICABLE TO** : DHI Water & Environment

**COURSE OUTLINE :**

Surface water hydrology is one of the core courses in civil engineering that covers a wide range of topics related to different components, at or near earth's surface of the global hydrological cycle. The spread of knowledge base is wide and relevant topics are multiple in this major field of study. To provide a comprehensive learning strategy, this course is sub-divided into three major modules, namely Hydrological Processes, Hydrological Analysis and Hydrological Design. The first module starts with the fundamental concept of hydrology and hydrologic cycle and its importance on earth. This module ends with an overall discussion on the importance of this subject in the context of climate change as a part of motivation. Next module focuses on different important components of the hydrologic cycle, starting with the most vital one i.e., precipitation and gradually discussing evaporation, evapotranspiration, infiltration, run-off, streamflow, flood etc. All necessary theoretical concepts of each process, their physical modelling and their real-life measuring arrangements are discussed elaborately. Necessary schematics diagrams and practical photographs are used along with illustrative examples to make the theoretical concepts clear. More real-life applications are considered in the last module in which Hydrological design concepts are developed.

**ABOUT INSTRUCTOR :**

Prof. Rajib Maity is Associate Professor in Department of Civil Engineering, Indian Institute of Technology, Kharagpur, India. His research area includes hydroclimatology, stochastic hydrology, climate impacts on water resources, hydrologic time series analyses and forecasting etc. He has published two books and more than 140 research articles in different peer reviewed journals and conferences and chapters in books. His most recent book on 'Statistical methods in Hydrology and hydroclimatology' is published with Springer. Some of his professional recognitions include Fellow, Royal Meteorological Society, UK, A K Singh Chair faculty, Faculty Excellence Award (IIT Kharagpur), Humboldt Fellowship (Experienced Researchers), (Germany), James Rennel MoES Fellow, Prof. R. J. Garde Research Award, ASCE 2011 Outstanding Reviewer (USA), Emerging Leaders Fellowship (Australia), BOYSCAST Fellowship, IEI Young Engineers Award, DAAD fellowship for IIT faculty (Germany), International ICE WaRM Fellowship (Australia), Prof. N. S. Govinda Rao Memorial Gold Medal, IISc. He is an associate editor of the ASCE Journal of Hydrologic Engineering, American Society of Civil Engineers (ASCE), ISH Journal of Hydraulic Engineering (Taylor and Francis), and former associate editor of Journal of Earth System Sciences (Springer).

**COURSE PLAN :**

**Week 1:** Introduction to Hydrological Processes.

**Week 2:** Hydrologic Analysis of Precipitation.

**Week 3:** Abstraction from Precipitation.

**Week 4:** Streamflow measurement.

**Week 5:** Hydrologic Analysis of Run-off.

**Week 6:** Analysis of Hydrograph-I.

**Week 7:** Analysis of Hydrograph-II.

**Week 8:** Floods and Flood Routing-I.

**Week 9:** Floods and Flood Routing-II.

**Week 10:** Hydrologic Frequency Analysis.

**Week 11:** Applications of Frequency Analysis.

**Week 12:** Hydrologic Design of Reservoir Capacity.