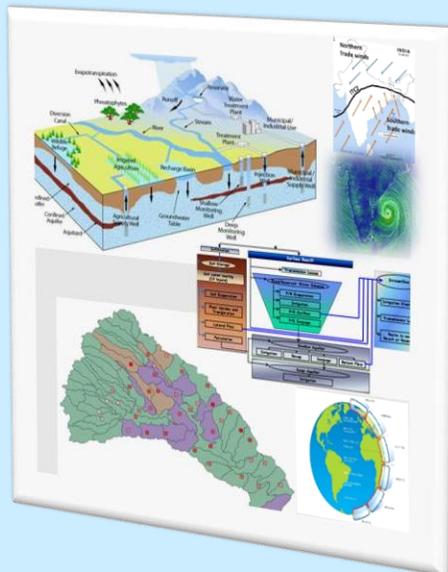


**Training course
on**

HYDRO-METEOROLOGICAL AND CLIMATE DATA ANALYSIS: BASIC AND ADVANCED TECHNIQUES (HyMCBAT 2023)

February 27- March 3, 2023



Organized by

**NATIONAL INSTITUTE OF HYDROLOGY
ROORKEE-247667**

BACKGROUND

Water is the most essential natural resource for life and is likely to become a critical scarce resource in the coming decades due to continuous increase in population and the impacts of anthropogenic as well as climate changes. Hydro-Meteorological data plays a very important role in the assessment of the availability of water resource as well as investigation and design of various water resources projects.

Meteorological (hydro-meteorological) observations are made especially for the weather analysis and interpretation, to make forecast, real time disaster warning, for the study of climate change, to study air pollution, aviation operations, agricultural, meteorological and hydrological research studies and many more.

The hydrological data, especially the stream flow data is important to determine the extent and pattern of available water supply and used in determining the reliable water supplies for various purposes, which include domestic water supply, commercial and industrial use; irrigation, hydropower and transport channels etc. These records are therefore very useful in planning and surface water related projects. Apart from water resources projects the stream flow records are also utilized in designing the bridges, culverts, flood plain delineation and flood warning systems.

Climate change is posing a challenge to the existing water resources and now there is clear evidence for an observed change in global surface temperature, rainfall, evaporation and extreme events since the start of 20th century. Today, in most agro-climatic regions and river basins of India the hydrological cycle is being modified quantitatively and/or qualitatively, due to global warming as well as human activities. It is likely that the frequency

of floods and droughts will increase during 21st century due to projected climate change, which would enhance the severity of water extreme events and may prove the greater challenge to society. There is an urgent need to carry out extensive studies and research on the recent climate changes that are taking place, and are likely to take place over the Indian subcontinent along with the linkages with the changes taking place over the world.

Therefore, the engineers (decision makers) and policymakers should be well equipped with the knowledge of various analysis techniques to take up such studies. The training course will present a range of analysis techniques starting from simple regression analysis to non-linear artificial intelligence techniques with case studies of actual field applications.

COURSE CONTENTS

The specialized training course on “Hydro-Meteorological and Climate data analysis: Basic and Advanced Techniques” will consist of lectures by Scientists and Professors with wide range of experience in the subject. Lectures will be followed by limited hands on sessions in virtual mode. The course material would not only be useful for the participants but also serve as a reference for practicing hydrologists and engineers. It is proposed to keep a two-way interaction throughout the training course so that there is a good sharing of field experiences, problems and their analysis/modelling solutions. Following topics shall be covered in this course:

- ◆ Hydrological cycle and basics of catchment processes
- ◆ Hydrological Observations, error analysis and data processing techniques
- ◆ Long term hydro-climatic data analysis techniques
- ◆ Climate change and climate variability
- ◆ The Wet and Dry Spell analysis
- ◆ Quantitative Precipitation forecast and Verification techniques

- ◆ Monsoon and real-time weather monitoring
- ◆ Development of climatic Indices and teleconnections
- ◆ Meteorological Analysis of extreme rainfall events
- ◆ GCM data downscaling for climate change studies
- ◆ ANN tool for data analysis and Modelling
- ◆ GLOF, Dam-break flood and Analysis
- ◆ Google Earth Engine Application

DATES AND VENUE

The training course will be held at **National Institute of Hydrology, Roorkee** during February 27- March 3, 2023.

PARTICIPATION

The course is intended for engineers, scientists and officers working in water resources/ irrigation and other related departments of Central/State Govt. and those who are in academic profession. Post graduate and research scholars are encouraged to attend the course. Representatives of NGO's and other civil society groups can also participate. We expect participants to have keen interest in the analysis of hydro-meteorological and climate data as well as their use in modelling of various hydrological processes.

ABOUT NATIONAL INSTITUTE OF HYDROLOGY (NIH)

National Institute of Hydrology (NIH) is a premier Research and Development organization under the Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti, Government of India. It was established as an autonomous society in 1978 with its headquarters at Roorkee, Uttarakhand. The main objectives of NIH are to undertake, aid, promote and coordinate systematic and scientific work in all aspects of hydrology and water resources management. The Institute was declared a Science and Technology (S&T) organization in 1987.

The Institute is an ISO 9001:2015 Certificated organization. Over the years, the Institute has grown as a center of excellence for pursuing research activities in hydrology and water resources with emphasis on technology transfer and demand driven, user-defined, strategic research. The research in the Institute is being carried out under six scientific divisions at the headquarters at Roorkee, seven Regional Centers located at Belgaum, Jammu, Kakinada, Bhopal, Guwahati, Patna and Jodhpur. The institute has well equipped laboratories like Remote Sensing Lab, Nuclear Hydrology Lab, and Water Quality Laboratories with state of the art equipment. The institute pursues capacity development by way of organizing specialized training courses. For more information about NIH, please visit www.nihroorkee.gov.in

REGISTRATION

The registration fee per participant is as follows:

Govt. Employees, Academicians, NGO's and PSUs = INR 10,000/-
PG Students/Research Scholar = INR 6,000/-

The fee includes the registration, course material, working lunch, session tea and certificate. Accommodation will be provided on nominal rate in NIH Guest House on request.

It is intended to register only a limited number of participants for this training program on a first-come, first-served basis after the registration fees have been paid. The interested participants are required to fill in the registration form online ([Click Here](#)) latest by **30th Jan 2023**. The selected participants are requested to provide the proof of online payment of registration fee **latest by 10th February 2023**. (Only selected participants will be intimated about the payment details). An Institute/University identity card should be uploaded while submitting the application. If needed, the intending participants may contact the course coordinators for further information.

PATRON

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All correspondence related to the course should be made with the course coordinator(s).