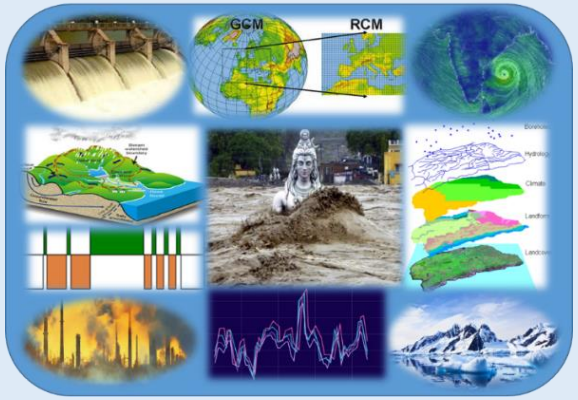
One-Week Training Course

on

WEATHER AND CLIMATE DATA SCIENCE: ADVANCED PRACTICES AND ANAYSIS TOOLS

(December 02 – 06, 2024)



Organised by

CENTRE FOR CRYOSPHERE & CLIMATE CHANGE STUDIES (C4S)
NATIONAL INSTITUTE OF HYDROLOGY
ROORKEE – 247 667
UTTARAKHAND, INDIA

ABOUT THE COURSE:

In today's rapidly changing environment, understanding weather and climate has become more critical than ever. With the rise of global temperatures, more frequent extreme weather events, and shifting weather patterns, the need for advanced data science practices and tools to analyze weather and climate data is undeniable. Weather and climate data science combines meteorological science with advanced data analytics, enabling us to process vast amounts of data to extract valuable insights. These insights help inform decision-making in fields ranging from agriculture, water resources, hydro-power, and disaster preparedness.

Meteorological observations are made especially for the analysis and interpretation of weather patterns, to make weather forecast, provide real-time disaster warning, etc. However, these datasets from various sources including weather stations, satellite observations, weather and climate models are stored in various data formats. Visualising and analysing these datasets are crucial for determining and/or making preliminary observations on weather patterns, and anomalies of climate systems. To do so, several tools and untilities such as CDO, WGRIB, Python libraries, R Packages, Google Earth Engine (GEE), etc. are available. From basic timeseries analysis to advanced climate modeling and visualisation, these tools enable researchers, meteorologists, and data scientists to generate insights that inform policy, enhance decision-making and improve the understanding of complex climate systems.

Understanding advanced practices and tools in weather and climate data science is not only essential for scientists and researchers but also for policymakers, businesses, and communities. As the impacts of climate change become more pronounced, the ability to analyze and interpret weather and climate data with accuracy and precision will be pivotal in shaping a sustainable and resilient future.

COURSE CONTENTS:

The training course will be conducted in physical mode and will consist of lectures and hands-on exercises by scientists from NIH with wide range of expertise on the subject. This training gives an overview of the weather & climate modelling, analysis of observed, reanalysis, & projected climate datasets, and advanced tools for climate change assessment. The training will include wide range of topics relevant to the subject, but in particular the following topics will be covered:

1. Climate system, processes and advancements in weather and climate modelling.
2. Monsoon dynamics, weather systems and global teleconnections
3. Sources of climate data, viz. ground-based, radar, satellites, GCMs etc. and tools for pre-processing.
4. Statistical analysis of long-term weather and climate data
5. Wet and dry spell analysis, extreme rain event (ERE) analysis.
6. Statistical and dynamical downscaling of climate data
7. Numerical model output verification skill scores
8. Climate scenarios, projections and uncertainty analysis

9. Climate data analysis and visualisation using R, Python, Google-earth engine, GrADs etc.

In particular, the participants will be directed to the several open data sources of historical (observed), reanalysed and future (projected) climate datasets. In addition, the participants will be introduced to several powerful tools like CDO, WGRIB, GEE, Python libraries, and packages in R.

DATES AND VENUE

The training course will be held during December 02 – 06, 2024 at **National Institute of Hydrology, Roorkee**. Roorkee is a medium-sized town situated in Haridwar District of Uttarakhand and is well connected by road and rail from New Delhi, Dehradun and Haridwar.

PARTICIPATION

The training course is open to the residents of India only. It is intended for the professionals (engineers, scientists, policymakers, and academicians) of various government and private organizations actively working in the field of weather and climate change. Post graduate students and research scholars are encouraged to attend this training.

REGISTRATION

The registration fee per participant including GST is as follows

Government / Private Organisations / PSUs / NGOs and Academicians	**₹15,000/-**
Bonafide Student	**₹10,000/-**

The **fee includes accommodation in the institute's guest house on sharing basis, registration kit, course material, working lunch, and session tea**. A course completion certificate and course material will be given to all participants.

The seats are limited to 30 participants and the registration shall be done on the first come first served basis after the registration fees has been paid. The intending participants are requested to contact the course coordinators and register themselves by filling in the registration form online (**Click Here**) **along with the proof of online payment of registration fee latest by 20th November 2024**. The registration fee has to be transferred online to the following bank account

Name of Account: NIH Project
Account Number: 4044000100174852
Name of Bank: Punjab National Bank, IIT Roorkee
IFSC: PUNB0404400

It should be noted that the participation in the course will only be confirmed after receipt of registration fee.

ABOUT THE INSTITUTE

The training course is proposed to be held at the National Institute of Hydrology (NIH), Roorkee. NIH is an autonomous society under the **Department of Water Resources, River Development and Ganga Rejuvenation under the Ministry of Jal Shakti, Govt. of India**. It is the country's premier research institute in the field of hydrology and was established in 1978 with an objective 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) Organisation in 1987.

The institute undertakes, aides, promotes and coordinates systematic and scientific work in all aspects of hydrology. Seven regional centres of the institutes are located in different physiographic regions of the country. The scientific and technical credibility of the institute in conducting hydrological and water resources research is well recognised both at the national and international level. For more details, please visit nihroorkee.gov.in.

COURSE DIRECTOR

Dr. M K Goel
Director
NIH, Roorkee – 247 667 (Uttarakhand)
Phone: 01332 272106; Fax: 01332 272123
Email: director.nihr@gov.in

COURSE CONVENOR

Dr. Surjeet Singh
Scientist 'G', & Head
Centre for Cryosphere and Climate Change Studies
NIH, Roorkee – 247 667 (Uttarakhand)
Phone: 01332 249230
Email: surjeet.nihr@gov.in

COURSE COORDINATOTR(S)

Dr. Ashwini Ranade
Scientist 'D'
Centre for Cryosphere and Climate Change Studies
Phone: 01332 249322
Email: ranadeashwini.nihr@gov.in

Dr. Sunil Gurrapu
Scientist 'D'
Centre for Cryosphere and Climate Change Studies
Phone: 01332 249240
Email: gurrapus.nihr@gov.in

All correspondences related to the training course should be made with the course coordinator(s)