



Science Academies' Refresher Course on "Hydrology of Floods"

Sponsored by

Indian Academy of Sciences (www.ias.ac.in), Bengaluru
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Organised by

G B Pant University of Agriculture and Technology (GBPUAT), Pantnagar, Uttarakhand



in collaboration with

Western Himalayan Regional Centre, National Institute of Hydrology (NIH), Jammu

January 08–19, 2018

A Refresher Course on **Hydrology of Floods**, will be held at G B Pant University of Agriculture and Technology, Pantnagar (www.gbpuat.ac.in) during January 08- 19, 2018 (Venue: Jan 08-13, 2018 at NIH, Roorkee and Jan 14-19, 2018 at GBPUAT, Pantnagar).

The programme focuses on **Floods**, which have been the topic of investigation for many decades in India and abroad. Many researchers have studied flood as an event with reference to various disciplines such as hydrology, geography, geomorphology, geology, water resources, economics, sociology, natural hazard and many more. As one goes through the literature related to floods, it is observed that it falls into 3-4 categories viz., flood in general, hydrology of floods, flood geomorphology and paleo flood hydrology. The Hydrology of Floods deals with questions of time- and space- dependent processes of water accumulation and its distribution, and is focussed on hydrologic and hydraulic engineering aspects of floods. A flood is a hydrological event characterized by high discharges and/or water levels that can lead to the inundation of land adjacent to streams, rivers, lakes, wetlands, and other water bodies. The flood can be caused by the concentration of runoff water in the upstream channel network due to excess rainfall-runoff over the catchment, or the failure of a dam or local embankment or the presence of obstructions downstream. The local capacity of the channel may be limited due to vegetation growth or sedimentation, or the morphological raising of the riverbed. The speed of propagation of the flood peak is dependent on the gradient of the riverbed and the extent of flooding. These factors affecting the speed of travel of the flood are a function of two important concepts: storage and conveyance. Water in the channel and on the flood plains can be "stored" dynamically. Storage is significant in affecting the rate at which a flood peak decreases as it propagates downstream. Conveyance refers to the ease with which water (rather than the flood disturbance) moves downstream. The degree of flood plain conveyance depends on the topography of the flood plain and obstructions such as hedges and boundary walls, embankments, etc. The propagation of the flood is intimately connected with the conveyance. It is in this context the subject of flood routing plays a key role for studying flood wave movement in natural rivers, manmade channels and reservoirs, and natural lakes.

The key objectives of the course are to impart training to the participants for enabling them:

- To understand the flood hydrology (e.g. general description, causes and analyses and geomorphic effectiveness of floods for management, planning and administration of unusual floods that may occur in future);
- To acquire knowledge about various methods and hydrological modeling tools for flood modelling and mitigation measures;
- To get knowledge about advanced instruments for hydro-metrological data collection and remote sensing and climate data for flood impact assessment
- Practical application of various modelling tools and techniques using field and satellite data (through lectures and hands-on experiments)

The objective of this course is also to create interest in the subject and to know about the Hydrology of Floods to post graduate students, research scholars, young faculty of universities, colleges and institutions.

Topics: Basics of Hydrology, Hydrologic Extremes i.e. Floods, Hydro-Climate Extremes, River Morphology and Dynamics, Flood Hazards, Hydrometry and Open-channel hydraulics, Rainfall-Runoff Analysis, Flood Routing and Flood Forecasting, Ungauged catchment studies, Flood analysis and modeling, Urban Floods including case studies of Jammu, Chennai and Bangalore, Glacial Lake Outburst Floods, Reservoir routing/Reservoir scheduling, Remote Sensing and GIS Applications in Flood Modeling and Management, Soil Erosion and Sediment Yield, Climate Change –Introduction, Basics including IPCC reports, Climate Change–Assessment, Projections and related Models (GCMs and RCMs), Climate Change and its effects on Floods.

The course also involves Group Discussion/Panel Discussion/Movie show/Case studies/Presentations/Field Visits/Laboratories visit/Institution Visits. Field visits to nearby **Ganga River** at Haridwar and another **Sharada River** to know about the aspects of flood erosion and protection measures implemented and a day Excursion visit to **Gola River** and lakes like Nainital, Bhimtal, Sattal.

Experts: Prof Pradeep Mujumdar (IISc, Bangalore), Dr Sharad K Jain (NIH, Roorkee), Prof D K Srivastava (IITR), Prof N K Goel (IITR), Prof M C Perumal (IITR), Dr M K Goel (NIH), Dr B Sahoo (IITKGP), Dr C T Dhanya (IITD), Dr B R Nikam, (IIRS, DDN), Prof Jyothi Prasad (GBPUAT), Dr Ravindra Kale (NIH, Jammu) and also experts from IITR, NIH, Roorkee and GBPUAT, Pantnagar.

College / University teachers/ Scientists / Students / Research Scholars with at least a Master's degree in Science or Degree in Engineering in related disciplines can apply. Apply online by clicking on the following link:

<http://web-japps.ias.ac.in:8080/Refreshcourse/HYHY.jsp> (Last date for receipt of online applications: **31st October 2017**)

Course Director: Professor P P Mujumdar, Chairman, Interdisciplinary Centre for Water Research (ICWaR), (<http://icwar.iisc.ernet.in/>) Indian Institute of Science (IISc), Bangalore-560012, Karnataka State.

A hard copy of the application should be sent by post or scanned copy by e-mail to:

Course Coordinator: Prof. (Mrs.) Jyothi Prasad, Department of Civil Engineering, G B Pant University of Agriculture and Technology, Pantnagar-263145, Uttarakhand State; e-mail: jptce@gbpuat-tech.ac.in, Mob: **09410119571 / 08449859593**;

Note: Selected participants will be provided with local hospitality and round trip shortest route train fare (3-tier AC) or equivalent as per science academy guidelines. No participation fee will be charged.

For more details visit: www.ias.ac.in or www.gbpuat.ac.in