



# ADVANCES IN HYDROLOGIC MONITORING OF WATERSHEDS

## Overview

India has vast length of rivers/streams throughout the country. Significant portion of the population that is vulnerable to hazards such as floods, droughts, dam break and levee break disasters are residing very close to these waterbodies. The Government of India has recently initiated several educational/research programs to understand the water resources and manage them effectively. One such initiative is National Hydrology Project with the main objective to improve the extent, quality and accessibility of water resources information, and to strengthen the capacity of water resources management institutions in India.

A crucial aspect for an effective water resources management is a rigorous and thorough hydrologic data collection, subsequent modeling and analysis. There have been significant advances in the techniques of hydrologic data collection. Such advances include newer generation digital streamflow devices such as Acoustic Doppler Current Profilers that can detect water flow in shallow depth up to 0.3 m, new low-cost real-time water level monitoring systems using Internet-of-Things (IoT) capabilities, open hardware-based rain-gauge systems and many more. Preparing the next-generation water resources managers, hydrologists and hydraulic modelers by imparting these newer techniques, while emphasizing the continued use of conventional systems (e.g., pygmy current meters, AA current meters).

A review of the surface water field measurements and evaluating the integration of these datasets into watershed monitoring is timely requirement for Indian context. Therefore, the objective of this program is to introduce two-week field-based course for the participants that would review the concepts of hydrology and hydraulics and to apply these concepts for hydrologic measurements that are taken in the field. In addition, a low-cost real-time watershed monitoring framework will be introduced to the participants with real-world examples.

<b>Modules</b>	<b>A: Fundamental of field hydrology and field measurement techniques</b> <b>B: Advances in the field of sensing and computation systems for hydrologic measurements</b> (14 <sup>th</sup> to 26 <sup>th</sup> December 2020; 20 Lectures & 20 Lab. Sessions/Tutorials) Number of participants for the course will be limited to fifty.
<b>Dates for the course</b>	14 <sup>th</sup> to 26 <sup>th</sup> December 2020
<b>You Should Attend If...</b>	<ul style="list-style-type: none"> <li>▪ You are a field engineer or research scientist working in the fields of hydraulics, hydrology and watershed modeling and management.</li> <li>▪ You are a student or faculty from academic institution interested in learning how to work/carrying out research in field hydrology, monitoring, modeling and management of watersheds</li> </ul>
<b>Fees</b>	The participation fees (Excluding Lodging & Boarding) for taking the course is as follows: <b>Students Participants and Scholars</b> : Rs. 2,000/- <b>Faculty (Internal &amp; External) &amp; Scientists</b> : Rs. 4,000/- <b>Persons working in Industry / Consultancy firms</b> : Rs. 8,000/- <b>Student participants from abroad</b> : USD 100 <b>Other participants from abroad</b> : USD 200 The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided accommodation on payment basis.
	<b>Students registered with grading will be evaluated for two credits based on continuous evaluation in tutorials, midterm and end of course examinations. Grade will be awarded based on the performance in the evaluation.</b>

## The Faculty

International Expert



**Alfred J. Kalyanapu** is an Associate Professor in the Department of Civil and Environmental Engineering at the Tennessee Technological University, Cookeville, Tennessee, USA. He and his research group ([www.techwarms.org](http://www.techwarms.org)) focus on understanding the complex interplay water resources has with climate, urbanization, energy development and how in turn affects the sustainability and resilience of communities. To achieve this long-term goal, he pursues research in the following areas: Watershed Analysis, Hydraulic Modeling & Analysis, Floodplain Management, Monte Carlo based Risk Analysis, and Hydrological Data Monitoring and Data Analysis. He teaches courses in hydraulics, engineering hydrology, and GIS applications in Civil and Environmental Engineering. Along with his students, Dr. Kalyanapu performs field hydrological measurements including water level monitoring, streamflow measurements along major rivers and streams in the states of Tennessee and Kentucky. He has been actively involved in professional societies including the American Society of Civil Engineers (ASCE), and American Water Resources Association, Tennessee Section for the past 8 years and held executive committee membership roles in these organization. He is currently the Chair of the ASCE Computational Hydraulics Committee.

**Institute Expert:**



**K. Venkata Reddy**, Ph.D. is an Associate Professor in the Department of Civil Engineering at the National Institute of Technology Warangal. He is carrying out research in watershed modelling applications for last eighteen years. He has carried out post-doctoral research work on Impact of Climate change on Water Resources at Texas A&M University with Raman Fellowship given by GOI. He is presently carrying out research in the fields of real time forecasting of flow in watersheds, climate change impacts on water resources and decision support systems under climate change scenarios. He has published more than 70 research papers in National and International conferences and journals in the field of water resources along with geospatial applications in different other domains.



Two-week GIAN course on

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## Course Coordinators

**Dr. K. Venkata Reddy**

**Associate Professor**

**Department of Civil Engineering**

**National Institute of Technology Warangal  
Warangal – 506 004, Telangana State, India**

Phone: +91-8332969245, +91-9441666379

E-mail: kvreddy@nitw.ac.in, kvreddy229@gmail.com

**Dr. Deva Pratap**

**Professor**

**Department of Civil Engineering**

**National Institute of Technology Warangal  
Warangal – 506 004, Telangana State, India**

Phone: +91- 9848573005

E-mail: prataprec@yahoo.com

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