

About GIAN Course:

About GIAN Course: Ministry of Human Resource Development (MHRD), Government of India (GoI) has launched an innovative program titled “Global Initiative of Academic Networks (GIAN)” in higher Education, in order to garner the best international experience. As part of this, internationally renowned Academicians and Scientists are invited to augment the Country’s academic resources, accelerate the pace of quality reforms and elevate India’s scientific and technological capacity to global excellence.

About NIT Warangal

National Institute of Technology Warangal, formerly known as Regional Engineering College was established in 1959. Over the years it has developed into a premier institute of higher learning and is ranked among the top technical education institutions in India. There are 14 Departments offering eight undergraduate and 31 post-graduate programmes besides doctoral programmes. About 5000 students across the country and about 500 international students’ study in the campus. It is a fully residential campus sprawling over 250 acres with excellent infrastructure.

About Warangal

Warangal is the second largest city of the state of Telangana. It is situated at a distance of 140 km from the state capital Hyderabad (Nearest Airport). It is well connected by Rail (Kazipet Junction is 2 km away and Warangal Station is 12 km away) and by Road (NH 202). Warangal is renowned for its rich historical and cultural heritage. It was the seat of erstwhile 5th Kakatiya dynasty. It is a place of tourist attraction with a number of historical monuments like Thousand Pillars Temple, Warangal Fort, Bhadrakali Temple, Ramappa Temple and Laknavaram Lake.



Brief Profile of the Civil Engg. Department

The Department of Civil Engineering offers B. Tech in Civil Engineering, Eight M. Tech programs including Water Resources Engineering and Remote Sensing and GIS and offers PhD in all civil engineering domains. The Department is a recognized QIP Centre since 1978. It has well established and well-equipped state of the art laboratories with experienced faculty engaged in teaching, research, capacity building activities and industry extension services. Water Resources Engineering and Remote Sensing group Faculty are carrying out research in the various aspects of water resource systems. Faculty members represent several policy making and professional bodies. The Department has liaison with reputed industries and R&D organizations.

For any queries regarding the course, please contact

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A Two-Week GIAN Course
On

**ADVANCES IN HYDROLOGIC
MONITORING OF WATERSHEDS**

July 10th – 21st, 2023

Call for Registration and Participation

International Faculty
Dr. Alfred J. Kalyanapu

Coordinator
Prof. K. Venkata Reddy

Organized by
Department of Civil Engineering
National Institute of Technology
WARANGAL – 506 004
Telangana State, INDIA

Overview of the GIAN Course:

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.

2.0 Objectives

The primary objectives of the course are:

- ✚ Familiarize participants to the fundamentals of hydrologic field measurement practices,
- ✚ Enhance the skills of the participants in streamflow measurement by wading,
- ✚ Enhance the skills of the participants in applying Acoustic Doppler Current Profiler for measuring streamflow,
- ✚ Introduce the participants to gather bathymetric data of water bodies including rivers and lakes,
- ✚ Introduce the participants about low-cost rain gauge and water level sensors

Who can participate?

This program on **Advances in Hydrologic Monitoring of Watersheds** will be beneficial to faculty members /research scholars/students/scientists and technologists who are working in the field of water resources and allied fields. The following persons can attend this program:

- ✚ Faculty from academic Institutions
- ✚ Scientists/Technologists from research organisations.
- ✚ Working people from government, private organisations, start-ups and NGOs.
- ✚ Research scholars and Master's students from academic institutions.

(Participants for the course will be selected on first come first served basis)

Registration Fee:

- ❖ Faculty & Scientist from Research Organizations: Rs. 2,000/-
- ❖ Participants from Industry /Consultancy Firms: Rs. 4,000/-
- ❖ PG & Ph.D Students: Rs. 1,000/-
- ❖ PG & Ph.D students with grade: Rs.2000/-
- ❖ Students from Abroad: \$ 50/-
- ❖ Faculty/Scientist/Industry Participants from abroad: \$ 100/-

Selection and Mode of Payment:

Selected candidates will be intimated through **e-mail**. They have to remit the necessary course fee to the Bankas per the details given below.

Account Name	GIAN NITW
Account No & Bank	62447453600, SBI
Branch	SBI, NIT Warangal, 20149
IFSC Code	SBIN0020149
MICR Code	506002030,
SWIFT Code	SBININBBH14

Candidates who registered early will be given preference in short listing process.

How to Register?

Step-1: One-time Web (Portal) Registration:

- Visit **GIAN** Website at the link:
<http://www.gian.iitkgp.ac.in/GREGN/index>
- Create login User ID and Password.
- Fill up the blank registration form and do web registration by paying Rs 500/- online through Net Banking /Debit / Credit card.
- This provides him/her with life time registration to enrol in any number of the GIAN courses offered in future.

Step-2: Course Registration (Through GIAN Portal):

- ✚ Log in to the GIAN portal with the user ID and Password created.
- ✚ Click on **"Course Registration"** option given at the top of the registration form.
- ✚ Select the Course titled **"Advances in Hydrologic Monitoring of Watersheds"** from the list and click on **'Save'** option.
- ✚ Confirm your registration by Clicking on **'Confirm Course'**.

Step-3:

- The registered participants on GIAN portal will be informed by the Program Coordinator through E-mail regarding their shortlisting/selection for the program.
- The shortlisted candidates are then required to pay the applicable Registration fee, as mentioned above.

International Faculty: Dr. Alfred J. Kalyanapu



Alfred J. Kalyanapu is an Associate Professor in the Department of Civil and Environmental Engineering at the Tennessee Technological University, Cookeville, Tennessee, USA. His research group (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. His research focuses on 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.

Host faculty: Dr. Venkata Reddy Keesara



Venkata Reddy Keesara, is working as Professor in the Department of Civil Engineering at the National Institute of Technology Warangal. He is carrying out research in watershed modelling

applications for the last twenty 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 carrying out research in the fields of real time forecasting flow in watersheds, climate change impacts on water resources and decision support systems under climate change scenarios. He is presently carrying out SPARC sponsored Indo-US project as PI on real time forecasting of floods using SWAT model. He has published more than 120 research papers in journals and in National and International conferences in the field of water resources along with geospatial applications in different other domains.

Course details

The program is planned for 20 hours of teaching plus 20 hours laboratory/tutorial sessions spanned over 10 days. Main content of the program is as follows:

- **Day 1:** Lectures on Fundamentals of Field Hydrology, Hydrologic data collection and management.
- **Day 2:** Lectures on validation and verification of field measurements and basic overview of streamflow measurement. Tutorial session on R- programming method for data analysis.
- **Day 3:** Lecture sessions on Streamflow Measurement using Wading Techniques and Streamflow Measurement using Acoustic Doppler Current Profiler (ADCP).
- **Day 4:** Field trip to local streams and lakes and carrying practical sessions on streamflow measurement using wading and ADCP methods.
- **Day 5:** Tutorial session on Data Analysis of Streamflow collected from wading ADCP methods.

- **Day 6:** Lectures on Bathymetric mapping, remote sensing methods for stream depth measurement. Practical session on bathymetric measurement using sonar devices.
- **Day 7:** Lectures on geospatial visualization of field data, IOT in water resources engineering, open hardware paradigm in field hydrology, watershed instrumentation for hydrological modeling studies. Tutorial session on Epicollect mobile app for field data collection and transfer.
- **Day 8:** Lectures on low-cost sensors of field hydrology and tutorial session on setting up watershed monitoring network
- **Day 9:** Practical sessions on sensors installation and examination to the participants
- **Day10:** Lecture session on research problem formulation in field hydrology.

