

## About IIT Hyderabad



भारतीय प्रौद्योगिकी संस्थान हैदराबाद  
Indian Institute of Technology Hyderabad

Inventions and innovations are key words on which the foundation of IIT Hyderabad (IITH) is based. Being one of India's 18 IITs, IITH started functioning in 2008. Currently the institute has about 150 faculty, 1200 students and offers Bachelors, Masters and PhD programs in 9 engineering, 3 science, and 2 other departments. IITH was ranked 7th nationally under engineering category for its exemplary performance in teaching, research, facilities, and resources (source: <https://www.nirfindia.org/engg>). At IITH, research is a culture among the faculty and students. IITH has developed state-of-the-art infrastructure for advanced research and produced more than 400 publications in internationally reputable journals. For more details: <http://www.iith.ac.in/>

## About Prof Walter Illman



Dr. Walter Illman is a Professor of Physical and Contaminant Hydrogeology at the Department of Earth and Environmental Sciences, University of Waterloo, Canada. Prof. Illman received his PhD degree from University of Arizona, USA in 1999. He specializes in groundwater; and uses mathematical modeling, laboratory and field experiments to understand contaminant transport and natural degradation of organic contaminants in groundwater. To his credit, Prof. Illman has more than 50 publications in internationally reputable journals and more than 75 conference proceedings and abstracts.

## About Dr KBVN Phanindra



Dr. KBVN Phanindra is an Assistant Professor of Civil Engineering at Indian Institute of Technology Hyderabad. Dr. Phanindra received his PhD degree from New Mexico State University, USA in 2010. He specializes in hydrogeologic characterization, groundwater flow and transport modeling, GIS applications to groundwater. To his credit, Dr. KBVN has 6 publications, 12 conference proceedings, and 3 sponsored research projects.

## Additional Information

- Eligible candidates can download the registration form at: [http://civil.iith.ac.in/linked/gian\\_gw\\_regn.pdf](http://civil.iith.ac.in/linked/gian_gw_regn.pdf)
- Demand draft (DD) should be paid in favor of Registrar, IIT Hyderabad, payable at Hyderabad
- Duly filled registration form along with original DD should be sent by registered/speed post to reach the course coordinator by 06 June 2016
- An additional amount of Rs. 1,000 per participant will be collected (in cash) to provide lunch for all 10 days of the course
- All future communications should be done through e-mail ([gian\\_gw@iith.ac.in](mailto:gian_gw@iith.ac.in))
- It is recommended to keep a photocopy of the registration form and DD for future reference
- Students and research scholars can avail (on request) hostel accommodation at IIT Hyderabad (at a nominal fee of Rs. 75/- per day)
- All other participants will be accommodated (on request) in near by hotels as per their budget
- Seats will be filled on first come first serve basis
- Participants working on research projects in the domains of groundwater flow and transport modeling can discuss their projects with the instructors towards successful completion

## Contact Us

For queries and additional information .....

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GLOBAL INITIATIVE OF  
ACADEMIC NETWORK (GIAN)

AND

TECHNICAL EDUCATION QUALITY IMPROVEMENT PROGRAMME (TEQUIP)

10 Days Course on

**GROUNDWATER FLOW AND  
TRANSPORT MODELING  
THROUGH FRACTURED  
GEOLOGIC MEDIA**

27 June – 08 July, 2016



भारतीय प्रौद्योगिकी संस्थान हैदराबाद  
Indian Institute of Technology Hyderabad

Venue

**Indian Institute of Technology Hyderabad**

## Course Overview

More than 67% of Indian principal aquifers are situated on consolidated formations (hard rocks). Groundwater in these formations is derived from secondary porosity (weathering and fractures) with limited yield, and is dictated by fracture hydraulic properties and connectivity. In India, characterizing and modeling fractured aquifer systems is still being done in a simplified way, by largely ignoring the heterogeneity in fracture hydraulic properties. There is a pressing need for a paradigm shift to adopt novel methods that can effectively characterize aquifer heterogeneity. For example, hydraulic and pneumatic tomography have been gaining popularity in the recent years, as an alternate to existing approaches. This course aims to introduce such novel methodologies in modeling fractured rock aquifers, for the benefit of scientific and societal community of the country.

## Course Objectives

This course is aimed at imparting scientific understanding of hydrogeologic framework and flow and transport modeling in fractured geologic media. At the end of the course, the participant is able to:

- Become familiar with hydrogeology of Indian hard rock aquifers
- Identify groundwater potential zones of hard rock aquifers using surface and borehole resistivity surveys
- Become familiar with the available methodologies for flow and transport modeling through fractured geologic media
- Numerically simulate groundwater flow through fracture geologic media using Hydrogeosphere
- Perform laboratory cross-hole pumping experiments on locally available hard rock systems (*to the possible extent*)
- Study the concepts of hydraulic and pneumatic tomography in characterizing heterogeneity in fractured geologic media

## Course Contents

The following topics/concepts will be covered during the course period:

- Overview of hydrogeology of Indian principal aquifers
- Electrical Resistivity Tomography (ERT) in hydrogeologic mapping of fractured rock aquifers
- Basics of geophysical inversion theory
- Hands on with groundwater mapping using surface and borehole ERT data
- Modeling strategies for flow and transport through fractured geologic media
- Estimation of hydraulic and pneumatic properties of fractured geologic media through single-hole and cross-hole tests
- Laboratory sandbox analysis of single-hole and cross-hole tests – data collection and analysis
- Methods to deal with heterogeneity in fractured geologic media: from traditional geostatistics to hydraulic tomography
- Fundamentals of hydraulic tomography to characterize porous and fractured aquifers
- Applications of hydraulic tomography in fractured geologic media: laboratory and field studies

## Evaluation and Grading

- This course is evaluated for 2 credits
- Evaluation of the course is done through reading assignments, home works, and quizzes
- Each participant will be awarded a letter grade based on his/her academic performance during the course
- In addition, participation certificate will be issued to all the participants

## Eligibility Criteria

- Students at graduate or higher level, specializing in hydrogeology, geophysics, water resources, groundwater, environmental, or allied fields
- Research scholars and Research scientists from National Laboratories and R&D institutes
- Faculty from academia working/teaching in the domains of water resources, environmental, hydrology, or similar disciplines
- Practicing engineers and technical employees of government and private organizations working in hydrogeology, irrigation, groundwater, environmental, or allied sectors

## Registration Fee

### Indian Participants

- Students and Research scholars – Rs. 2,000 \*
- Faculty and Research scientists – Rs. 10,000
- Practicing Engineers and Employees – Rs. 15,000

### International Participants

- Students and Research Scholars – US \$ 200 \*
- All other Participants – US \$ 500

**Participants from TEQUIP Institutions are Waived from Registration, Accommodation, and Food Charges**

\* Registration fee includes access to attend all lectures, use laboratory facilities, course material, and coffee/tea/water during the course days

## Important Dates

- Last date for receiving registration forms (*by post*)  
**13 June 2016 (Monday)**
- Notification to participants (*by e-mail*)  
**18 June 2016 (Saturday)**
- Confirmation on hotel accommodation (*by e-mail*)  
**22 June 2016 (Wednesday)**
- Course dates  
**27 June – 08 July 2016**