

**Technical Education Quality Improvement Programme  
(TEQIP-II)**

on

**Advances in Numerical Simulation Techniques for  
Hydraulics, Hydrology and Water Resources  
Management – II (ANST-HHWM-II)**

**With Special Emphasis On  
Programming in C / C++ / FORTRAN / MATLAB**

**(June 01-06, 2015)**

*International Faculty:*

**Professor (Dr.) Walter H. Graf**

Emeritus Professor  
Laboratoire de Recherches Hydrauliques  
Ecole Polytechnique Federale de Lausanne  
Lausanne, Switzerland

*National Faculties:*

**Professor (Dr.) Dhruvajyoti Sen**

**Dr. Bhabagrahi Sahoo**

**Dr. Anirban Dhar**

IIT Kharagpur



**Organized by**

**School of Water Resources**

**Indian Institute of Technology Kharagpur**

**Kharagpur-721 302**

**BACKGROUND**

To manage effectively the scarce global fresh water resources, efforts have been put forward by various researchers world-wide to accurately assess the river basin flow processes. Modelling the quantity dynamics of water transport at river basin-scale is very much essential for flood modelling & its management, basin-scale rainfall-runoff modelling, water resources assessment, reservoir operation, river basin planning & management etc. With the evolution of computational power, a number of complex numerical models have been developed in the last few decades by several researchers which range from the simple to conceptual and physically-based modelling approaches to deal with the complex hydrological process components. Some of these models have the capability to be integrated with the global climate change models.

In light of this view, this course has been designed to enhance the technical skill of the faculties, practicing engineers and field hydrologists to make aware of the recent developments in the numerical techniques in hydraulics, hydrology and water resources management to solve global water resource problems through basic technical knowledge and 'hands on training'.

**DATES AND VENUE**

The training course will be held at **School of Water Resources, IIT Kharagpur** during June 01-06, 2015.

**COURSE CONTENT**

The course is designed to provide a recapitulation of the basic equations apart from exposing the participants to their numerical solution techniques using C / C++ / FORTRAN / MATLAB computer languages. The course material is expected to be useful for the water professionals to deal with projects, field problems and as an aid for teaching material.

<b>Date</b>	<b>09:00-11:00</b>	<b>11:15-13:15</b>	<b>13:15-15:00: Lunch Break</b>		<b>15:00-17:30</b>
<b>Jun-01</b>	Introduction to Fluvial Hydraulics	Least Square & Numerical Integration			Visit to Hydraulics and Hydrology Experimental Facilities
<b>Jun-02</b>	Hydrodynamic Equations	Solution of Simultaneous Equations			Introduction to Programming Languages for Finite Difference Methods
<b>Jun-03</b>	Uniform Flow	Discrete Fourier Transformation			Solution of water resources problems using FORTRAN coding
<b>Jun-04</b>	Non-uniform Flow	Solution of Ordinary Differential Equations			Solution of water resources problems using C / C++ coding
<b>Jun-05</b>	Unsteady Flow (Kinematic, Diffusive, Translatory, Dynamic)	Solution of Partial Differential Equations: Parabolic & Elliptic			Solution of water resources problems using MATLAB coding
<b>Feb-06</b>	Transport of Sediments	Solution of Partial Differential Equations: Hyperbolic	Examination & Valediction		



## PARTICIPATION

The following members can attend the course:

- Faculty members of State / Central Govt. / Private engineering colleges affiliated with TEQIP-II OR approved by AICTE
- Engineers, scientists and officers working in State / Central Govt. departments / industries dealing with irrigation and water resources
- Postgraduate students and Research Scholars from TEQIP-II affiliated colleges

## REGISTRATION FEE FOR ALL PARTICIPANTS

All the participants have to submit the duly filled in Registration Form along with a Bank Draft of Rs.1000/- as non-refundable Registration Fee in favour of **CEP-STC, IIT Kharagpur**; payable at: **Syndicate Bank, Kharagpur Branch** (Code: 9556) or **SBI, Kharagpur Branch** (Code: 0202). The registration Form has to be posted to the address of the Course Coordinator.

**Faculties / students from TEQIP-II affiliated colleges need to be forwarded their Registration Form from their respective Head of the Department and Supervisor (only for students).**

## COURSE FEE

- Participants from the **TEQIP-II** affiliated colleges: NIL
- Participants from non-**TEQIP-II** affiliated colleges/ engineers/ scientists/ officers: Rs.9,000/- (to be paid on arrival). They have to bear their own expenses towards accommodation, fooding, and local travels. Guest House (charge: Rs.600/day, AC double occupancy) and Hostel Guest Room (charge: Rs.100/day, Non-AC double occupancy) may be provided on request.

The demand draft has to be made in favour of **CEP-STC, IIT Kharagpur** as mentioned above for paying the Registration Fee.

## For electronic payment:

Name of Bank Account: CEP-STC; Bank Name: Syndicate Bank; Branch Name: SRIC, IIT Kharagpur; SB Account No.: 95562200002955; IFSC Code: SYNB0009556; MICR: 721025103.

TA/DA will be borne by the participants. The number of seats is limited. Shortlisting of participants will be done based on a strict scrutiny by the core technical committee.

## IMPORTANT DATES

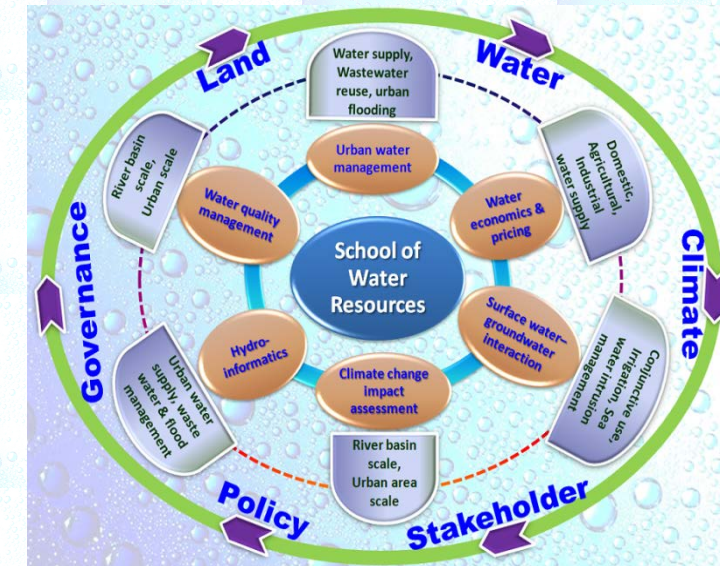
Last date for receipt of Registration Form: **15th May 2015**.  
Intimation to selected participants: **18th May 2015**.

## ABOUT THE SCHOOL OF WATER RESOURCES

The School of Water Resources aims at providing integrated and interdisciplinary approaches involving hydrological, biophysical, environmental, chemical, economic, institutional, and policy-planning aspects, to solve the ever-growing water-related challenges in domestic, agriculture and industry sectors. The Programme is intended for professionals and researchers from a wide range of backgrounds of Civil Engineering, Agricultural Engineering, Environmental Engineering, Chemical Engineering, and Mining Engineering. It aims to develop knowledge, insight and engineering skills required to design, implement and evaluate water management policies and strategies for effective water governance.

The academic programme of the School offers M.Tech. (in *Water Engineering and Management*) and Ph.D. for both fresh graduates from colleges seeking an advanced learning in the field of water management and engineering and also for in-service professionals and researchers from a wide range of backgrounds, who wish to enhance and supplement their already existing knowledge domain with

the state-of-the art skills and expertise. The programme consists of three phases. The foundation phase provides latest insights, context, and concepts in integrated water and environment management issues. In the specialization phase, the students choose to make in-depth study either in Rural and Urban Water Management or Biosystems Engineering. In the integration phase, the students are challenged to bring together and apply their cumulative learning process to solve the field problems in the form of an M. Tech. thesis.



## COURSE COORDINATOR

Prof. (Dr.) Dhrubajyoti Sen  
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## COURSE CO-COORDINATOR

Dr. B. Sahoo  
Assistant Professor, School of Water Resources  
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# REGISTRATION FORM

June 01-06, 2015

## Advances in Numerical Simulation Techniques for Hydraulics, Hydrology and Water Resources Management–II (ANST-HHWM-II)

(With Special Emphasis on Programming in C / C++ / FORTRAN / MATLAB)

Name of the participant: .....

Male  Female  Contact No. (Mobile): ..... E-mail: .....

The participant is a (tick any one):  
1. Faculty member from **TEQIP-II** affiliated colleges   
2. Faculty member from **non-TEQIP-II** (AICTE approved) colleges   
3. PhD/PG student from **TEQIP-II** affiliated colleges   
4. Personnel from Industry/Field/Profession

Name of the Institute/College/Organization.....

Affiliation: .....

Qualifications:

Degree	Discipline	Institution	Marks (CGPA or %)	Year
PhD				
PG				
UG				

Experience: .....  
.....

**Demand Draft (DD) details** (Please enclose a DD of Rs. 1000/- in favour of **CEP-STC, IIT Kharagpur**; payable at: **Syndicate Bank, Kharagpur Branch** (Code: 9556) **OR SBI, Kharagpur Branch** (Code: 0202))

Drawn on Bank	Place	Branch code	DD No.

Address for correspondence:.....  
.....  
.....

Date: ..... (Signature of Participant)

### RECOMMENDATION CERTIFICATE (ONLY FOR TEQIP-II PARTICIPANTS)

Certified that Mr./Ms./Dr. .... has been officially deputed for the above mentioned training course to be conducted by IIT Kharagpur.

Date: ..... Name & Signature of the Supervisor  
(for PG/PhD Student only)

Seal & Signature of Head of the Department  
for respective TEQIP-II Institute

## **List of TEQIP-II Project Institutions**

### **WEST BENGAL**

1. NIT Durgapur, West Bengal
2. Indian Institute of Engineering and Technology, Shibpur, Howrah, West Bengal
3. Murshidabad College of Engineering and Technology, Berhampore, West Bengal
4. Narula Institute of Technology, Pargnas, West Bengal
5. RCC Institute of Information Technology, Kolkata, West Bengal
6. University Institute of Technology, Burdwan University, Burdwan, West Bengal
7. West Bengal University of Technology, Kolkata, West Bengal
8. Bankura Unnayani Institute of Engineering, Bankura, West Bengal
9. Birbhum Institute of Engineering & Technology, Birbhum, West Bengal
10. College of Engineering & Management, Kolaghat, West Bengal
11. Govt. College of Engineering and Textile & Technology, Berhampore, West Bengal
12. Heritage Institute of Technology, Kolkata, West Bengal
13. M.C.K.V. Institute of Technology, Howrah, West Bengal
14. University College of Technology-University of Calcutta, West Bengal
15. JIS College of Engineering, Nadia, West Bengal
16. Faculty of Engineering & Technology-Jadavpur University, Jadavpur, West Bengal

### **CHHATTISGARH**

17. NIT Raipur, Chhattisgarh
18. Government Engineering College, Bilaspur, Chhattisgarh
19. Government Engineering College, Jagdalpur, Bastar, Chhattisgarh
20. Government Engineering College, Raipur, Chhattisgarh
21. Rungta College of Engineering & Technology, Bilai, Chhattisgarh

### **ODISHA**

22. NIT Rourkela, Odisha
23. College of Engineering & Technology, Bhubaneswar, Odisha
24. Veer Surendra Sai University of Technology, Burla, Sambalpur, Odisha

### **JHARKHAND**

25. ISM Dhanbad, Jharkhand
26. NIT Jamshedpur, Jharkhand
27. Cambridge Institute of Technology, Ranchi, Jharkhand
28. Birla Instituted of Technology, Mesra, Ranchi, Jharkhand

### **BIHAR**

29. NIT Patna, Bihar
30. Muzaffarpur Institute of Technology, Muzaffarpur, Bihar
31. Bhagalpur College of Engineering, Bhagalpur, Bihar