

**Training Course on**

**HYDROLOGICAL INVESTIGATION TECHNIQUES FOR  
WATER RESOURCES DEVELOPMENT & MANAGEMENT**  
**(26-28 August 2012)**

- **RESOURCE PERSONS**
- **SCHEDULE**
- **CONTENTS**



## National Institute of Hydrology

### Training Course on HYDROLOGICAL INVESTIGATION TECHNIQUES FOR WATER RESOURCES DEVELOPMENT & MANAGEMENT (26-28 August 2012)

#### RESOURCE PERSONS

1. **Er. R. D. Singh**, Director, National Institute of Hydrology, Jalvighyan Bhawan, Roorkee- 247667 (Uttarakhand), E-mail:[rds@nih.ernet.in](mailto:rds@nih.ernet.in)
2. **Dr. C. K. Jain**, Scientist-F & Head, Environmental Hydrology Division, National Institute of Hydrology, Jalvighyan Bhawan, Roorkee- 247667 (Uttarakhand), E-mail:[ckjain@nih.ernet.in](mailto:ckjain@nih.ernet.in)
3. **Er. C. P. Kumar**, Scientist-F & Head, Hydrological Investigation Division, National Institute of Hydrology, Jalvighyan Bhawan, Roorkee- 247667 (Uttarakhand), E-mail:[cpk@nih.ernet.in](mailto:cpk@nih.ernet.in)
4. **Dr. Sanjay K. Jain**, Scientist-F, Water Resources Systems Division, National Institute of Hydrology, Jalvighyan Bhawan, Roorkee- 247667 (Uttarakhand), E-mail:[sjain@nih.ernet.in](mailto:sjain@nih.ernet.in)
5. **Dr. J. V. Tyagi**, Scientist-F, Surface Water Hydrology Division, National Institute of Hydrology, Jalvighyan Bhawan, Roorkee- 247667 (Uttarakhand), E-mail:[tyagi@nih.ernet.in](mailto:tyagi@nih.ernet.in)
6. **Dr. Sudhir Kumar**, Scientist-F, Hydrological Investigation Division, National Institute of Hydrology, Jalvighyan Bhawan, Roorkee- 247667 (Uttarakhand), E-mail:[skumar@nih.ernet.in](mailto:skumar@nih.ernet.in)
7. **Dr. M. K. Goel**, Scientist-F, Water Resources Systems Division, National Institute of Hydrology, Jalvighyan Bhawan, Roorkee- 247667 (Uttarakhand), E-mail:[mkg@nih.ernet.in](mailto:mkg@nih.ernet.in)

8. **Dr. A. K. Lohani**, Scientist-E2, Surface Water Hydrology Division, National Institute of Hydrology, Jalvighyan Bhawan, Roorkee- 247667 (Uttarakhand), E-mail: [lohani@nih.ernet.in](mailto:lohani@nih.ernet.in)
9. **Dr. S. D. Khobragade**, Scientist-E1, Hydrological Investigation Division, National Institute of Hydrology, Jalvighyan Bhawan, Roorkee- 247667 (Uttarakhand), E-mail: [suhas@nih.ernet.in](mailto:suhas@nih.ernet.in)
10. **Dr. Anupma Sharma**, Scientist-E1, Ground Water Hydrology Division, National Institute of Hydrology, Jalvighyan Bhawan, Roorkee- 247667 (Uttarakhand), E-mail: [anupma@nih.ernet.in](mailto:anupma@nih.ernet.in)
11. **Dr. M. Someshwar Rao**, Scientist-E1, Hydrological Investigation Division, National Institute of Hydrology, Jalvighyan Bhawan, Roorkee- 247667 (Uttarakhand), E-mail: [somesh@nih.ernet.in](mailto:somesh@nih.ernet.in)
12. **Dr. Surjeet Singh**, Scientist-E1, Ground Water Hydrology Division, National Institute of Hydrology, Jalvighyan Bhawan, Roorkee- 247667 (Uttarakhand), E-mail: [surjeet@nih.ernet.in](mailto:surjeet@nih.ernet.in)
13. **Dr. Manohar Arora**, Scientist-C, Surface Water Hydrology Division, National Institute of Hydrology, Jalvighyan Bhawan, Roorkee- 247667 (Uttarakhand), E-mail: [arora@nih.ernet.in](mailto:arora@nih.ernet.in)

**Hydrological Investigation Techniques for Water Resource Development & Management at NIH, Roorkee under PDS**  
 (August 27-30, 2012)

**TRAINING SCHEDULE**

Date/ Day	Time	Topic	Faculty
Day-1 27 August, 2012 Monday	09:00-10:00 am	Registration	
	10:00-11:00 am	Inaugural function/Tea	
	11:00-11:15 am	Tea break	
	11:15-12:15 pm	Practicing hydrology-an overview	Er. R. D. Singh
	12:15-01:15 pm	Overview of project hydrology and data requirement	Dr. A. K. Lohani
	01:15-02:00 pm	Lunch	
	02:00-03:00 pm	Processing and analysis of precipitation data	Dr. Manohar Arora
	03:00-04:00 pm	Surface water data processing using SWDES	Dr. A. K. Lohani
	04:00-04:15 pm	Tea break	
	4:15-6.15 pm	Visit to Water Quality Lab	Dr. M. K. Sharma
Day-2 28 August, 2012 Tuesday	09:00-10:00 am	Assessment of groundwater potential	Er. C. P. Kumar
	10:00-11:00 am	Groundwater data requirement and analysis	Er. C. P. Kumar
	11:00-11:15 am	Tea break	
	11:15-12:15 pm	Conjunctive use of surface water and groundwater resources-I	Dr. M. K. Goel
	12:15-01:15 pm	Conjunctive use of surface water and groundwater resources-II	Dr. M. K. Goel
	01:15-02:00 pm	Lunch	
	02:00-03:00 pm	Instruments and methods for hydro-meteorological observations	Dr. Manohar Arora
	03:00-04:00 pm	Instruments & methods for monitoring surface water and groundwater water system	Dr. Sudhir Kumar
	04:00-04:15 pm	Tea break	
	04:15-06:15 pm	Field trip to Haridwar	
Day-3 29 August, 2012 Wednesday	09:00 -10:00 am	Techniques of soil moisture measurement	Dr. J. V. Tyagi
	10.00-11:00 am	Geophysical techniques for ground water exploration	Dr. Sudhir Kumar
	11:00-11:15 am	Tea break	
	11:15-12:15 pm		
	12:15-01:15 pm	Water quality monitoring and assessment	Dr. C. K. Jain
	01:15-02:00 pm	Lunch	
	02:00-03:00 pm	Environmental isotopes for hydrological investigations	Dr. M. S. Rao
	03:00-04:00 pm		
	04:00-04:15 pm	Tea break	
	04:15-06:15 pm	Visit to Nuclear Hydrology lab	Dr. M. S. Rao
Day-4 30 August, 2012 Thursday	09:00-10:00 am	Application of remote sensing and GIS in Hydrological investigation	Dr. Sanjay K. Jain
	10:00-11:00 am	Conservation and management of lakes	Dr. S. D. Khobragade
	11:00-11:15 am	Tea break	
	11:15-12:15 pm	Concept and principles of watershed management	Dr. J. V. Tyagi
	12:15-01:15 pm	Groundwater development and management in coastal zones	Dr. Anupma Sharma
	01:15-02:00 pm	Lunch	
	02:00-03:00 pm	Impact of climate change on water resources	Dr. Surjeet Singh
	03:00-04:15 pm	Panel Discussion	
	04:15-06:15 pm	Valedictory function	

## TABLE OF CONTENTS

Lecture No.	Topic of Lecture	Page No.
L1	Practicing hydrology-an overview - <b>Er. R. D. Singh</b>	1-46
L2	Overview of project hydrology and data requirement - <b>Dr. A. K. Lohani</b>	47-66
L3	Processing and analysis of precipitation data - <b>Dr. Manohar Arora</b>	67-86
L4	Surface water data processing using SWDES - <b>Dr. A. K. Lohani</b>	87-110
L5	Assessment of groundwater potential - <b>Er. C. P. Kumar</b>	111-134
L6	Groundwater data requirement and analysis - <b>Er. C. P. Kumar</b>	135-160
L7	Conjunctive use of surface water and groundwater resources-I - <b>Dr. M. K. Goel</b>	161-174
L8	Conjunctive use of surface water and groundwater resources-II - <b>Dr. M. K. Goel</b>	175-188
L9	Instruments and methods for hydro-meteorological observations - <b>Dr. Manohar Arora</b>	189-198
L10	Instruments & methods for monitoring surface water and groundwater water system - <b>Dr. Sudhir Kumar</b>	199-216
L11	Techniques of soil moisture measurement - <b>Dr. J. V. Tyagi</b>	217-232
L12	Geophysical techniques for ground water exploration - <b>Dr. Sudhir Kumar</b>	233-242
L13 & 14	Water quality monitoring and assessment - <b>Dr. C. K. Jain</b>	243-262
L15 & 16	Environmental isotopes for hydrological investigations - <b>Dr. M. S. Rao</b>	263-282
L 17	Application of remote sensing and GIS in Hydrological investigation - <b>Dr. Sanjay K. Jain</b>	283-296
L18	Conservation and management of lakes - <b>Dr. S. D. Khobragade</b>	297-314
L19	Concept and principles of watershed management - <b>Dr. J. V. Tyagi</b>	315-328
L20	Groundwater development and management in coastal zones - <b>Dr. Anupma Sharma</b>	329-336
L21	Impact of climate change on water resources - <b>Dr. Surjeet Singh</b>	337-347