



# A brief report of Training Programme on “Advance Instrumentation Technique: Hands-on-Training”

19-21 December, 2016

National Institute of Hydrology, Roorkee, Uttarakhand

Urban settlement and growing industrial development combined with rapid increasing demand for water are causing more and more water quality problem. More than ninety percent of water quality problem in India are due to indiscriminate discharge of municipal wastes, Industrial effluents are responsible for pollution to a lesser extent but the effects produced by them may be more serious as nature is often unable to assimilate them and agriculture is also responsible for degrading the river water quality by generating runoff which contain predominately organic compounds from the use of mineral fertilizer and chemical pesticides.



For proper river basin planning it is very essential to combine it with water quality problems and hydrological analysis. Such water quality analysis involves use of advanced instruments of water quality testing. The training programme is organised by Environmental Hydrology Division, National Institute of Hydrology, Roorkee, Uttarakhand on “Advanced

Instrumentation Techniques: Hands-on-Training” is organised under the HRD



programme of Central Pollution Control Board during December 19-21, 2016. To provide an overview of the water quality testing and monitoring instruments to have full knowledge of the latest advancements taken place in analytical instrumentation i.e. AAS, ICP-OES, ICP-MS, GC & GC-MS by the experts from various organisations such as NIH, IITR-Lucknow, IIT-Roorkee and JNU-Delhi etc.

### **First Day: (19.12.2016)**

On first day first session registration, inaugural well come address given by the Dr. C.K. Jain, Scientist ‘G’ & Head, Environmental Division and key notes given by Er. R.D. Singh, Director, NIH-Roorkee. After all formalities a very good lecture delivered by Er. R.D. Singh, Director, NIH on “Status and Strategies for Management of Water Resources in India”. In his lecture given brief information on status of surface and ground water resources, state-wise dynamic fresh ground water resources, ground water potential in river basin, state-wise fresh ground water resources, water requirement for various purposes, management, conservation and restoration of water resources.



Dr. C.K.Jain, Head, Environment Hydrology Division delivered the lecture on the topic of “Water Quality Monitoring Planning”. The lecture presents the

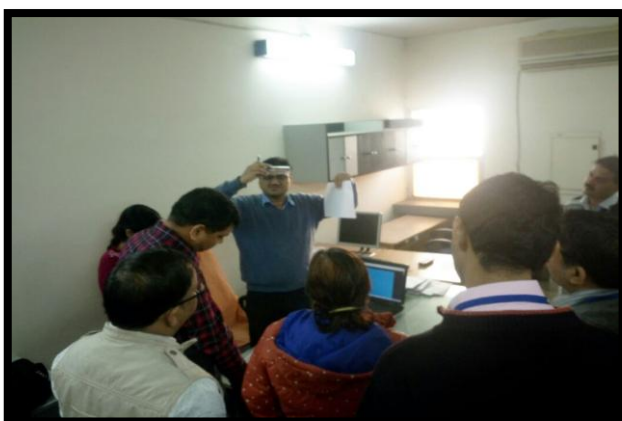


concepts of water quality management for sustainable development. In his lecture the basic knowledge of objective and planning of water quality monitoring, sampling location, determinants of interest, frequency & time of sampling etc. After taking the delicious lunch the lecture delivered by Dr. Dinesh Mohan, Professor, Jawaharlal Nehru University,

New Delhi on “Uncertainty Measurement and its Incorporation in Water Quality”. It is important tool of measurement does not imply doubt about the validity of a measurement. At the end of the session of the day visited NIH laboratory and presented technical information about Ion Chromatography (IC) and give demonstration of IC by Dr. M. K. Sharma, Scientist ‘D’, NIH.

### **Second Day:( 20.12.2016)**

On second day training programme a very useful lecture given by Dr. R. K. Dutta, Associated Professor, Department of Chemistry, IIT-Roorkee on the topic of “Atomic Spectrometry for Elemental Analysis”. He presented and given brief knowledge of Atomic Spectrometry has been widely used for performing elemental analysis using absorption spectrometry as well as emission technique. They are respectively referred to as atomic absorption spectrometry and atomic emission spectrometry. He said that these important instrumental technique i.e. basic principal of the instrument, essential components of the AAS such as radiation



sources, atomizer, monochromator, hollow cathode lamp and readout devices etc. Hands-on instrument i.e. AAS and ICP-MS were demonstrated with principal and how to excess with software by the Dr. Bhupendra Singh, Professor, Department of Chemistry, IIT-Roorkee and Dr. C.K. Jain,

Scientist ‘G’, National Institute of Hydrology.

### **Third Day: (21.12.2016)**

On last day of the training programme the impressive lecture was given by Dr. Naseem Ahmed, Associate Professor, Department of Chemistry, IIT-Roorkee on “Gas Chromatography- Mass Spectrometry (GC-MS): Working principal

and Application”. His lecture emphasized on gas chromatography-mass spectrometry (GC-MS) is a technique consisting of two analytical procedure coupled in series that is a Gas Chromatography (GC) for separation of volatile compounds and Mass Spectrometry (MS) for identification and quantification of molecular weight of each separated component. After taking delicious lunch the hands on training was given by Dr. Naseem Ahmed and Dr. C.K. Jain on GC-MS. During the demonstrating instruments with principal, how to prepare the samples, how to operate the instrument as well as software.



During the lecture and demonstration & hands on training of AAS, ICP, IC and



GC-MS a healthy and useful interaction were made by all the participants and clear all the doubt. In last day second half Dr. S.C. Ghos, Director-In-Charge, National Institute of Hydrology delivered a valedictory lecture and given training certificate to all the participants. He asked individual participants their views most of the

participant’s views were three days are not sufficient for such type of training programme. Overall good exposure and beneficial for me, because I am handling & operation of AAS and other instruments. Logistic facility was good and training was fruitful for me as well as my organization also.

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