Air Quality Management: Quality Assurance and Data Analysis
(Global Initiative of Academic Network, MHRD)

Overview

Air pollution is an emerging serious issue in India. This course will present an overview of the typical air quality management cycle followed in the US, the different components involved and how it might apply for India. The course will provide a basic introduction to the air quality management cycle and then expand in detail on the data analysis and quality assurance (QA) tasks associated with it. Measurement and modeling data are validated using proper QA/quality control (QC) without which the data is not scientifically defensible. The course will empower the students with the techniques and the tools to perform QA/QC and will introduce students to innovative data analysis techniques needed to mine the datasets.

Objectives:

The objectives of this course are to:

- Provide the students with a basic understanding of the air quality management approach, and the tools used as part of that process to study and tackle air pollution.

- Provide an understanding of the importance of quality assurance and the approaches used to determine or maintain data quality

- Introduce the students to different data analysis techniques using some case studies.

- **<u>Prerequisites:</u>**

- Basic knowledge of air quality and types of data

- Basic understanding/experience with programming

Modules	Air Quality Management: Quality Assurance and Data Analysis **Duration: 05-12-2016 to 09-12-2016** **Number of participants for the course will be limited to fifty.**
You Should Attend If you are an	- Executive, engineer and researcher from manufacturing, service and government organizations including NGOs and R&D laboratories. - Student at all levels (BTech/MSc/MTech/PhD) or Faculty from reputed academic institutions and technical institutions.
Fees	The participation fees for taking the course is as follows: **Participants from abroad(For both the modules)** : US $500 **Industry/ Research Organizations:** Rs. 10000/- **Academic Institutions:** Rs. 5000/- **Students of Constituent Units of JNTUH**: Rs. 1000/- **SC/ST students** Rs. 500/- The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility, Tea, Snacks, Lunch. The participants will be provided with accommodation on payment basis.

The Faculty

Dr. Prakash Doraiswamy, a research scientist at RTI, has 13 years of experience in the field of air quality, covering a broad range of areas in air quality management, including emission inventory development, the application and evaluation of regional photochemical air quality models, assessment of impact of regulations and future projections, particle and gaseous measurements, and diagnostic data analysis. His research focuses on the collective application of measurements and modeling in designing air quality management strategies. He has been a co-principal investigator (co-PI) for projects performed at RTI as well as at University of Tennessee. Prior to joining RTI, he worked at the State University of New York at Albany (SUNY) (air quality forecasting for air quality management), Desert Research Institute (DRI) ($PM_{2.5}$ source profiles characterization, continuous and filter-based $PM_{2.5}$ mass and species measurements, organic and elemental carbon analysis) and the University of Tennessee (emission inventory development and projections, air quality modeling, impacts of

control technologies and regulations). Dr. Doraiswamy is a member of the *Editorial Review Board* of the *Journal of* A&WMA and the *Editorial Advisory Committee* of *EM*: A&WMA's Magazine for Environmental Managers. He also serves on A&WMA's Critical Review and Particulate Matter Technical Committees. He has authored more than 18 peer-reviewed publications, nearly 60 presentations (including invited talks) and more than 10 reports.

Dr. V Himabindu is presently working as an Associate Professor in the center for Environment, Institute of Science and Technology, JNT University Hyderabad. She is also coordinating the center for alternative energy options. She received her doctoral degree in Chemistry in the year 1998. She published more than 100 technical papers in various national/international journals/conferences. 12 students were awarded Ph.D. degrees under her supervision and two more are continuing. She is currently working on 12 research projects funded by national and international organizations like BARC, APPCB, DRDO, DST, UGC, SEDA- Sweden, MNRE, DBT in the areas like Pollution monitoring and control technologies, reuse and Recovery of materials from waste, Remediation of contaminated lakes, Biofuels, Carbon nano materials, Energy materials, Hydrogen production and storage etc.

Course Coordinator:
Dr.V.Himabindu
Phone: 919849692838
E-mail:drvhimabindu@gmail.com
Local Coordinator:
Dr.G.Krishna Mohana Rao
919866123121
E-Mail: kmrgurram@jntuh.ac.in
For registration of GIAN portal and Course you may follow the link given below:
http://www.gian.iitkgp.ac.in/GREGN

Evaluation and Grading
There will be evaluation at the end of each module on the understanding of the concepts by the participant made during the course. Based on the evaluations finally a letter grade will be awarded to the participant. A completion certificate shall also be issued.

Course details:

Air Quality Management: Quality Assurance and Data Analysis

05/12/2016   Monday

Lecture 1:   *9.30 AM to 11.00AM*

Introduction and Course Objectives, Overview of Air Quality Management Process

with a focus on QA, Air quality management process

- Components of AQM

- Accountability and review

Lecture 2:   *11.15 AM to 12.45AN*

Air Quality Monitoring Network Design and QA,

Lecture 3: 2.00PM to 4.00PM

Sources of Data Error and Uncertainties

06/12/2016   Tuesday

Lecture 4:   *9.30 AM to 11.00AM*

Quality Assurance Process, Internal and External Evaluations, Method detection

limits, Uncertainty calculations

Lecture 5:   *11.15 AM to 12.45AN*

Levels of QA/QC, Data Checks to Ensure Data Quality, Tools and Approaches

Tutorial 1: 2.00PM to 4.00PM

Discussion about the Case Studies

07/12/2016   Wednesday

Lecture 6:   *9.30 AM to 11.00AM*

Data analysis tools, Introduction to R programming

Lecture 7:   *11.15 AM to 12.45AN*

Data Visualization, Data analysis of air quality measurements and modeling data

Tutorial 2: 2.00PM to 4.00PM

Discussion about the Case Studies and troubleshooting of data modeling issues

08/12/2016   Thursday

Lecture 8:   9.30 AM to 11.00AM

Source Apportionment, AQM using data from models and measurements

- Design value concept and analysis

- Accountability analysis

- Periodic review

Tutorial 3:   11.15 AM to 12.45AN

Hands-on QA/QC of Air Quality Measurements Data

Hands-on QA/QC of Air Quality Modeling Data

Tutorial 4: 2.00PM to 4.00PM

Hands-on data analysis with actual examples

- Interpresting air quality events

- Investigating issues with data

- Investigating soirces of poor air quality

Discusion about utilizing multiple data sources to enable understanding

09/12/2016   Friday

Lecture 9:   9.30 AM to 11.00AM

Group discussion on how to apply these techniques to India

Lecture 10:   11.15 AM to 12.45AN

Group exercise using actual air quality case in India

Tutorial 5: 2.00PM to 4.00PM

Review of all techniques discussed