GLOBAL INITIATIVE OF ACADEMIC NETWORK (GIAN)
Ministry of Human Resources Development
Government of India

5 DAY COURSE ON

Advanced Numerical Modeling of Meteorology and Emissions for Air Quality Modeling

29th Oct. – 02nd Nov., 2018

Venue

JNTUH College of Engineering, Kukatpally, Hyderabad

About GIAN:

Govt. of India approved a new program titled Global Initiative of Academic Networks (GIAN) in Higher Education aimed at tapping the talent pool of scientists and entrepreneurs, internationally to encourage their engagement with the institutes of Higher Education, viz., all IITs, IIMs, Central Universities, IISc Bangalore, IISERs, NITs and IIITs subsequently cover good State Universities where the spinoff is vast. The GIAN website may be visited for detailed information.

Overview

Air pollution is an emerging serious issue in India. The World Health Organization has recently ranked several cities in India including the capital city New Delhi to be amongst the worst polluted cities in the world. Over 7 million people are estimated to die prematurely due to air pollution globally. Numerical models have played a significant role in the U.S. to manage air pollution, and have led to a significant improvement in ambient air quality to protect public health since the 1970's, despite making rapid strides in economic growth. This course will expand on last year's course with a new focus on how to create emissions and meteorological inputs to air quality modeling systems – both at regional-scales like CMAQ, and local-scales like AERMOD, CALPUFF, SCIPUFF, R-LINE, etc. It will provide the students with an understanding of the atmospheric processes involved in meteorology, various emissions sources and source characteristics, and techniques to represent these in complex models for studying air quality to further manage air pollution. The course will provide a basic introduction to meteorological and emissions modeling that are key inputs for the air quality management cycle used to study regional-to-local scales of air pollution, and an introduction to the interactions between atmospheric forcings and air quality that are relevant at local to regional scales.

The main topics of the course is presented as follows:

Course: Advanced Numerical Modeling of Meteorology and Emissions for Air Quality Modeling**:**

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Main Topics:

- Air Pollution and Atmospheric Chemistry
- Overview of Air Quality Management (AQM) using Models and Measurements.
- Overview and Intro to WRF
- MCIP for Regional-scale model like CMAQ
- MMIF for Local-scale dispersion models like AERMOD
- Emissions Inventories for Indian Region
- Hands-on SMOKE Overview

Number of participants for the course will be limited to fifty.

Benefits of Attending the Course:

Candidates who have attended the course and followed the material should benefit in strengthening their background in the areas: Meteorology and Emissions for Air Quality Modeling.

Who should attend:

This course is intended to provide students, teachers, researchers, executives, engineers and researchers from manufacturing, service and government, organizations including NGOs and R&D laboratories.

Students at all levels (BTech/MSc/MTech/PhD) or Faculty from reputed academic institutions and technical institutions are invited to attend. **For the participation in the course, registration with GIAN is mandatory.** Registration to the portal is one-time affair and will be valid for the lifetime of GIAN. Once registered in the portal, an applicant will be able to apply for any number of GIAN courses as and when necessary. One-time Non-refundable fee of Rs. 500/- is to be charged for this service. For registration, the website is: *www.gian.iitkgp.ac.in/GREGN/index*

Course Fee:

The participation fees for taking the course is as follows:

Participants from abroad :	US $500
Industry/ Research Organizations	**:** Rs. 5000/-
Academic Institutions	**:** Rs. 3000/-
Full time Students	: Rs. 1000/-
Full time SC/ST students	: Rs. 500/-

There will be a concession of 50% of the fee for the faculty working in the constituent and affiliated colleges of JNTUH. 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.

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.

The Faculty

Dr. Sarav Arunachalam: Research Professor and Deputy Director at the University of North Carolina at Chapel Hill's Institute for the Environment and Adjunct Professor at the UNC Department of Environmental Sciences and Engineering has over 21 years of experience in providing scientific and program support for regulatory emissions and air quality modeling activities. Dr. Arunachalam has performed interdisciplinary research collaborating with

experts from atmospheric science and land use planning, risk analysis from atmospheric science, environmental engineering, transportation economists and public policy. Dr. Arunachalam is an international expert air quality modeler with extensive experience in developing modeling applications for regulatory support using both existing and evolving regional air quality models (such as CMAQ). His research has spanned a broad spectrum from scientific and program support for regulatory emissions and air quality modeling activities to developing innovative model applications to study multiple source sectors and perform source attributions. Over the past 16 years, he has served as the PI or technical lead on several projects for various state/regional agencies Federal agencies, including EPA, DOJ, NASA, NSF, and FAA, and the National Academies' Transportation Research Board. Most of his research during this period has focused on modeling and analyses that support air quality modeling activities for regulatory policy development.

Dr. Arunachalam has served as the Software Development Coordinator for UNC's Community Modeling and Analysis System (CMAS) Center since 2003, and develops and offers CMAQ and BenMAP training to an U.S. as well as worldwide audience, including countries such as Brazil, Canada, Colombia, India and South Korea. He serves as the Principal Investigator on a large multi-year multi□institution project since 2007 that provides emissions, meteorological, and air quality modeling support to the EPA's regulatory and research needs, and directs a U.S. DOT funded Aviation Sustainability Center of Excellence (ASCENT) to study aviation impacts on air quality at local to regional to global scales, and the environmental benefits of using alternate jet fuels. Dr. Arunachalam has published extensively, and given over 190 presentations.

Dr. S. Srinivasulu Joined as Lecturer of Civil Engineering in the year 1994 at Kakinada and worked at Centre for Spatial Information Technology, Institute of Science and Technology, Hyderabad for 7 years. Presently working as a professor of Civil Engineering, JNTUCE Hyderabad. Completed Ph.D. (Civil Engineering) with the Specialization of Hydraulics and Water Resources from IIT Kanpur. Visited as a scholar to CADSWES, University of Colorado, Boulder, USA and **Post Doc fellow** at U of S, Canada. Worked at ILMR, Saga University, JAPAN as a foreign researcher (Guest professor) in the year 2012 and 2015-16 for six months and seven months respectively. Selected to Asian Institute of Technology (AIT), Bangkok for Secondment programme by ministry of Human Resources, Govt. of India. Further Delivered Expert Lectures at Asean Lecture Programme conducted by Saga University Japan, 2014 and at LORA Saga university, Japan and performed as an Associate editor to International Journal Lowland Technology International. Published 15 International journal papers with relatively high impact factor and 15 international conferences in the relevant field of engineering. Won the award of best discussion from ASCE – Journal of Hydrologic Engineering, and reviewer to many international journals published by Elsevier, ASCE etc. Life member of ISTE and International Association of Lowland Technology.

Dr. V. Himabindu is a Professor, Centre for Environment, and Co-ordinator, Centre for Alternative Energy Options, Centre for Environment, Institute of Science and Technology, Jawaharlal Nehru Technological University Hyderabad (JNTUH), India. She received Ph. D in Chemistry from JNTU Hyderabad. She is the recipient of 17 research and development grants from the prestigious Indian Govt. and Private organizations. She has authored and edited more than 120 peer- review articles.

Her research focuses on monitoring of Air, Water and Soil pollutants and their control technologies, Bio fuels production, Energy materials, Sequestration of CO_2 gases from industrial air emissions and Hydrogen energy.

About the JNTUH:

The J.N.T University was in existence since 1972. It is a teaching and research oriented university consisting of 4 constituent engineering colleges JNTUH College of Engineering, Hyderabad (JNTUHCEH), JNTUH College of Engineering, Jagityala (JNTUHCEJ), JNTUH College of Engineering, Manthini (JNTUHCEM), JNTUH College of Engineering, Sulthanpur (JNTUHCES) and more than 400 affiliated colleges. In addition to the constituent colleges, the other units of JNTUH are School of Information Technology (SIT), Institute of Science and Technology (IST), School of Management Studies (SMS) and Academic Staff College (ASC). The university has numerous collaborative, teaching and research programs with universities from abroad and within India and with industries in the state of Telangana. The university offers engineering programs at both UG and PG level and many science and humanities programs at PG level. In addition, university also offers Ph. D. in engineering, science and humanities disciplines.

Contact Information:

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