

Overview of the Course

Fluidized bed reactors offer the advantages of excellent solid mixing and heat transfer characteristics. These reactors find widespread applications in chemical, petrochemical, pharmaceutical, metallurgical, energy and food industries. Some typical applications of fluidized beds include coal gasification, synthesis reactions, metallurgical operations, physical operations, cracking of hydrocarbons, combustion and incineration, biomass conversion and drying of solid particles, etc. Despite the widespread use, the complex hydrodynamics of fluidized bed reactors is still not completely understood. In analyzing important issues such as formation of local hot spots, by-passing, solids entrainment, designing internals and so on, detailed fluid dynamic models would be necessary and Computational Fluid Dynamic (CFD) based models can contribute uniquely in this regard. Computational flow modeling may greatly accelerate the entire reactor development program with enhanced confidence levels and better performance. Hence, this course on CFD modeling of fluidized beds, which discusses the fundamentals and reviews the modeling strategies would be of immense value to the participants

Course Contents:

The course lectures cover fundamentals of multiphase flow CFD and fluidization, numerical treatment of gas-solid flows, heat and mass transfer and chemical reactions in multiphase flows and the application of CFD modeling to fluidized bed reactors. These lectures will be complimented with necessary hands-on tutorial sessions using ANSYS Fluent and MFIX. These illustrations include solution of several problems on bubbling fluidized bed, two-fluid model, pipe-flow problem, circulating fluidized bed, writing user defined functions etc.

This course is organized in the form of lectures, tutorial / practical sessions, all spread over five days. A graded examination / project work will be conducted on the last day of the course.



Dr. Madhava Syamlal is a Senior Fellow in Computational Engineering division at National Energy Technology Laboratory (NETL), U.S. Department of Energy, Morgantown, WV, USA. His degrees are in chemical engineering: B.Tech from IIT (BHU), and MS and PhD from IIT, Chicago. As the founding Technical Director, he established the Carbon Capture Simulation Initiative (CCSI) for developing a multi-scale computational toolset for accelerating carbon capture technology development. The toolset is currently being used for carbon capture technology development and is under evaluation for commercialization by a software company. Dr. Syamlal previously led the development of the widely used open-source multiphase CFD code MFIX, multiscale co-simulation of process and device scales, and C3M chemical kinetics software. He led the development of the first commercial software for linking CFD models in FLUENT® with process simulation models in Aspen Plus® for enabling high fidelity process modeling that accounts for the effect of device-scale behavior on the overall process. He is a fellow of AIChE and the recipient of numerous awards such as DOE Secretary's Achievement Honor Award and AIChE's Fluidization Process Recognition Award. He has published several research papers in international journals and conferences. He organized many sessions and workshops on multiphase flow; established a multiphase flow conference series at NETL. For more details: https://mfix.netl.doe.gov/team_manager/madhava-syamlal-ph-d/

Who can Participate?

- Faculty/ scientistd/ industry professional working or interested in multiphase flow of fluidized beds

- Chemical or mechanical or materials professional interested in computational modeling of fluidized beds
- UG/PG student or research scholar interested / working in fluidized beds or fluidization

How to Register?

Stage-1: Web Portal Registration:

Visit <http://www.gian.iitkgp.ac.in/GREGN/index> and create login User ID and Password. Fill up the registration form and complete web registration by online payment of Rs. 500/-. This provides the user with life time registration to enroll in any number of GIAN courses offered.

Stage-2: Course Registration:

Login to the GIAN portal with the user ID and Password already created in Step 1. Click on Course Registration option at the top of Registration form. Select the Course titled “**Computational Fluid Dynamic Modeling of Fluidized Beds**” from the list and click on Save option. Confirm your registration by clicking on Confirm Course.

Registration Fee:

Faculty	Rs. 3,000/-
Participants from Industry /Research Organizations	Rs. 8,000/-
Students & Research Scholars	
• Without award of Grade	Rs. 1,500/-
• With award of Grade	Rs. 2,000/-
Students from abroad	\$ 300

Boarding & Lodging Fee:

Faculty, Participants from Industry /Research Organizations	Rs. 4,000/- Accommodation -Visitors Block
Student & Research Scholar	Rs. 2,500/- Accommodation -Institute Hostel

Selection and Mode of Payment

Selected candidates will be intimated through e-mail. They have to remit the necessary registration fee (**Mandatory for all**) and boarding & lodging fee (**if required**) to the Bank as per the details given below.

Account Name	GIAN NITW
Account No.	62447453600
Bank	State Bank of India
Branch	REC Warangal (NIT Campus)
Branch Code	20149
IFSC	SBIN0020149
MICR Code	506002030
SWIFT Code	SBININBB

Candidates registering early will be given preference in short listing process

For any queries regarding registration of the course, please contact the National Coordinators:

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About GIAN Course

MHRD, Govt. of India has launched an innovative program titled “Global Initiative of Academic Networks (GIAN)” in higher Education, in order to garner the best international experience. As part of this, internationally renowned Academicians and Scientists are invited to augment the Country’s academic resources, accelerate the pace of quality reforms and elevate India’s scientific and technological capacity to global excellence.

About the Institute and Warangal

National Institute of Technology, Warangal (NITW) formerly known as RECW is the first among seventeen RECs set up in 1959. Over the years, the Institute has established itself as a premier Institution in imparting technical education of a very high standard, leading to B.Tech, M.Tech and Ph.D. programmes in various specializations of Science and Engineering streams.

Warangal is known for its rich historical and cultural heritage. It is situated at a distance of 140 km from Hyderabad. Warangal is well connected by rail and road. National Institute of Technology, Warangal campus is 2 km away from Kazipet railway station and 12 km away from Warangal railway station.

About the Department

The Department of Chemical Engineering was established in the year 1964 and celebrated Golden Jubilee in the year 2014. The Department offers B.Tech in Chemical Engineering, M.Tech in Chemical Engineering & Process Control and Ph.D programs. Currently, the Department has 18 faculty members with expertise in different research areas. The Department has good research facilities for both experimental as well as simulation based research. The Department has conducted a number of GIAN courses both in Phase-I and Phase-II.



A Five Day
GIAN Course on

Computational Fluid Dynamic Modeling of Fluidized Beds

November 12 - 16, 2018

Call for Registration and Participation

International Faculty

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