

Fundamentals of Multiphase Flows and its Applications

Overview

The current course will primarily be concerned with dispersed multiphase flows. The essence of a dispersed multiphase flow is in the coupling between the phases. The continuous-phase influences the dispersed-phase through processes such as dispersion, preferential accumulation, agglomeration, and breakup. The dispersed-phase modulates the continuous-phase through back-coupling of mass, momentum and energy. Four fundamental interactions can be identified in a dispersed multiphase flow: 1) interaction among the continuous-phase fluid elements, 2) Continuous-to-dispersed-phase forward coupling, 3) Dispersed-to-continuous-phase back coupling, and 4) Interaction among the dispersed-phase elements either through direct collisions or as mediated by the continuous-phase.



The primary objectives of the course are

- To expose participants to the fundamental of dispersed multiphase flow physics
- Understand Euler-Euler and Euler Lagrangian framework
- Discuss examples where such flows occur and discuss how to solve these problems
- Expose the audience to the state of the art in modelling dispersed multiphase flow problems.

Course Information	Dates – 21st to 25th February 2023 Fundamentals of Multiphase Flow and its Applications										
You Should Attend If...	<ul style="list-style-type: none">▪ Engineers working in developing simulation tools for multiphase flow problems based on computational fluid dynamics.▪ Student at all levels (BTech/MSc/MTech/PhD) or Faculty from reputed academic institutions and technical institutions.▪ Knowledge of basic mathematical skills (calculus, probability, Transport Phenomena at the Bachelor level will be expected from all participants. <p>Number of participants for the course will be limited to fifty.</p>										
Fees	The participation fees for taking the course is as follows: <table><tr><td>Participants from abroad</td><td>: US \$ 500</td></tr><tr><td>Students</td><td>: INR 1000</td></tr><tr><td>Faculty</td><td>: INR 5000</td></tr><tr><td>Industry / Research Organizations</td><td>: INR 30000</td></tr><tr><td>Government Organizations</td><td>: INR 10000</td></tr></table>	Participants from abroad	: US \$ 500	Students	: INR 1000	Faculty	: INR 5000	Industry / Research Organizations	: INR 30000	Government Organizations	: INR 10000
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	<p>The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility.</p> <p>Modes of payment: Online transfer: Click here to pay: https://elearn.nptel.ac.in/gian/</p>
Accommodation	<p>The participants may be provided with hostel accommodation, depending on availability, on payment basis. Request for hostel accommodation may be submitted through the link: http://hosteldine.iitm.ac.in/iitmhostel/</p>
Registration Procedure	<p>Please follow the following steps for the registration:</p> <ol style="list-style-type: none"> 1. Go to GIAN website (http://www.gian.iitkgp.ac.in/GREGN/index) First time users need to register and pay a one-time fee of INR 500 / 2. Enroll for the course: Fundamentals of Multiphase Flow and its Applications. Once you enroll for the course, an Enrollment/Application number will be generated, and the course coordinators will be notified.

The Faculty

	<p>Prof. S. Balachandar is a Distinguished Professor and Newton C. Ebaugh Professor of Mechanical & Aerospace Engineering at the University of Florida, Gainesville, FL, USA. His research interests include multiphase flow modelling and analysis, large-scale simulations of transitional and turbulent flows, environmental multiphase flows, compressible multiphase flows. He is currently finishing a Cambridge University Press book on this topic, which will be used in this course,</p>
	<p>Prof. S. Pushpavanam is the Institute Chair Professor in the Chemical Engineering Department at the Indian Institute of Technology Madras, India. His expertise covers a wide range of problems of fundamental nature in the engineering sciences, particularly fluid dynamics, reaction and transport processes and micro-scale phenomena. His group specializes in technological projects with industrial significance; e.g. Plasma Coal Gasification and Nuclear Reactor Safety.</p>

Course Co-ordinator

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