

AICTE Sponsored Short Term Course

on

Advances in Thermofluidics of Multiphase Flows

4 – 9 November, 2019



Coordinators

Dr. Sateesh Gedupudi
Dr. Pallab Sinha Mahapatra
Dr. Srikrishna Sahu

Organized by

Department of Mechanical Engineering
Indian Institute of Technology Madras
Chennai - 600 036
URL: <https://mech.iitm.ac.in>

THEME OF THE COURSE

A short-term course on “Advances in thermofluidics of multiphase flows” is planned to be conducted at IIT Madras from 4th to 9th November, 2019, sponsored by All India Council for Technical Education (AICTE).

Multiphase flow systems find applications in many industrial processes. They are encountered in power plants, refrigeration and air-conditioning, combustion of fuels, solar thermal collectors, microfluidics, oil and gas industry, chemical process industry, fuel cells, biotechnology and food processing. The factors that make the multiphase flow a complex phenomenon are flow patterns, instabilities, interfacial heat transfer and drag, surface wettability and compressibility effects etc. Efficient design of the equipment that handles multiphase flows needs a good understanding of the hydrodynamics and the heat transfer aspects of the flow. Multiphase flow has been a topic of intensive research efforts in recent years.

The planned short-term course is primarily directed towards the teachers/researchers in various disciplines including Mechanical Engineering, Aerospace Engineering and Chemical Engineering. The focus of the course will be on introducing some of the key elements and concepts along with some of the practical applications in the light of the recent advances in multiphase flow. The course would have lectures by experts in the field of multiphase flows and may help the participants in designing the curriculum or in initiating/furthering their research in multiphase flows.

COURSE OBJECTIVES

- To present the fundamentals of multiphase flows and recent advances in multiphase flow systems.
- To introduce measurement techniques and instrumentation used in multiphase flows.
- To present numerical and analytical modeling approaches for multiphase flows.

COURSE CONTENTS

Fundamentals

- Spraying systems
- Spray evaporation and combustion
- Boiling, condensation and cavitation
- Cooling technique: spray cooling, film cooling, heat pipes, vapor chamber etc.

Measurement Techniques

- Particle laden flows: free shear flows, internal flows
- Internal gas(vapour)-liquid flows
- Wettability

Numerical Modeling

- Numerical modeling approaches
- Particle laden flows
- Droplets
- Two-phase instabilities

Lab visits

ELIGIBILITY AND REGISTRATION FEE

Engineering college teachers from AICTE approved colleges are eligible to apply. The course is open to faculty in different disciplines, particularly Mechanical Engg., Chemical Engg. and Aerospace Engg. There is no course fee for applicants from AICTE approved engineering colleges.

ABOUT THE DEPARTMENT

The Department of Mechanical Engineering at IIT Madras is as old as the Institute itself. With nearly 700 undergraduates, 500 graduate students and over 60 faculty members, the department is the largest in the country and one of the largest in Asia. Over 30 faculty members are actively engaged in teaching and research in the domain of thermofluids, which includes two-phase flow, surface wettability, microfluidics, cavitation, boiling, condensation, PCM-based heat sinks, bio-heat transfer, droplet and spray combustion, particle laden flows, biomass gasification, refrigeration and air-conditioning, solar thermal energy, internal combustion engines and turbomachines.

TRAVEL SUPPORT, BOARDING AND LODGING

The train fare (ONLY two-way 3-Tier AC train fare by the shortest route from your institute to Chennai and back) will be provided to the selected participants as per AICTE guidelines. Tatkal charges, if any, will not be reimbursed.

Stay will be provided to the interested participants at the Taramani Guest House, IIT Madras. Accommodation will be on twin sharing basis. No family accommodation and no accommodation for local (Chennai) participants will be provided.

IMPORTANT DATES

Last date for applications : 03-09-2019
Intimation of selection (by email) : 06-09-2019
Confirmation of participation (by applicant) : 16-09-2019

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APPLICATION

Name:
Designation:
Department:
Organization:

Qualification:
Experience:

Mailing address:

Phone:
Mobile:
Email:
(Required)

Date: **Signature of the applicant**

SPONSORSHIP CERTIFICATE

It is certified that Prof. / Dr. / Mr. /Ms.

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is a faculty member of our institute and will be permitted to attend the short term course on “Advances in Thermofluidics of Multiphase Flows” to be conducted at IIT Madras from 4th to 9th November, 2019, if selected.

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(Signature of approving authority with date and seal)

Note: Scanned copies of the application and the sponsorship certificate should be emailed to atfmf19@gmail.com.

The hard copies should be sent to Dr. Sateesh Gedupudi, #201, Heat Transfer and Thermal Power Lab, Department of Mechanical Engineering, IIT Madras, Chennai – 600 036.