

# Multiphase Combustion: Theory and Modelling

**191004L03: Course Date: Dec 05 – Dec 09, 2022 (Online Mode)**

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## Overview

Combustion is still the world's most important and most widely used energy conversion technology. Potential environmental damage and limited resources of fossil fuels require more intensive efforts to better understand the underlying combustion processes, especially those resulting from liquid fuels and subsequent sprays. The fundamental knowledge of sprays and combustion is expected to improve the design of the industrial combustion systems by enhancing the flame stability, improving the combustion efficiency, and reduction in pollutant formation. The short course is intended to provide fundamental understanding of this multi-scale, multi-physics problem, i.e. combustion, sprays and their potential applications and challenges in the development of modern combustor systems for the transportation, power-generation and other industrial applications.

<b>Course Information</b>	<b>Duration: Dec 05 – Dec 09, 2022 (05 days) – ONLINE MODE</b> <b>Total Contact Hours: 20 hours in 05 days</b>  Course participants will learn these topics through lectures and interactive sessions.
<b>Modules</b>	<b>Module 1.</b> Generality of Multiphase Flows <b>Module 2.</b> Liquid Atomization and Spray Structure <b>Module 3.</b> Characterization of Sprays and micro-processes <b>Module 4.</b> Turbulence and turbulent combustion <b>Module 5.</b> Phase Change Phenomena and Mixture Formation <b>Module 6.</b> Spray Transport and interphase coupling Dynamics <b>Module 7.</b> Turbulent Spray Combustion <b>Module 8.</b> Numerical Description Techniques of Turbulent Dispersed Spray Combustion
<b>You Should Attend If...</b>	<ul style="list-style-type: none"><li>• Executives, engineers and researchers from academia, industry and government organizations including R&amp;D laboratories with a background in aerospace, automotive, mechanical, and chemical engineering.</li><li>• Postgraduate students (MSc/MTech/PhD) and faculty from reputed academic institutions and technical institutions.</li></ul>
<b>Fees</b>	Selected participants will be intimated through email. The participation fees (including taxes) for taking the course is as follows:  <b>Faculty/Scientists/Industry Persons from abroad: US \$100</b> <b>Students from abroad: US \$50</b> <b>Private Industry: INR 4,000</b> <b>Govt. Research Organizations: INR 3,000</b> <b>Faculty: INR 2000</b> <b>Students: INR 500</b>

## The Faculty



**Prof. Amsini Sadiki** is the leader of the modeling and numerical group at the Institute of Energy and Powerplant Technology at the Technical University of Darmstadt (TUD). His research interests focuses on exergy analysis and on developing new techniques for modelling and simulating complex fluid flows in complicated geometries of energy systems including multiphase reacting flows and interacting processes using CFD.



**Prof. Ashoke De** is a Professor in the Department of Aerospace Engineering and having a joint appointment in the Department of Sustainable Energy Engineering at Indian Institute of Technology, Kanpur. His research interests are CFD, High Speed Flows, Flow-Acoustics Coupling, Fluid-Structure Interaction & Energy Harvesting, Turbulence Modeling, Multiphase flows and Combustion.

## Course Co-ordinator

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