



THEORY OF FIRE PROPAGATION (FIRE DYNAMICS)

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INTENDED AUDIENCE : UG, PG, MS and PhD students doing research in Combustion and related areas

INDUSTRY SUPPORT : Process and Fuel Industries, Nuclear industries and Industries those handle solvents and fuels.

COURSE OUTLINE :

- To enable students to apply the knowledge of combustion to fire propagation and control
- To emphasize the basics of the subject of fire, its physical characteristics and modeling.
- To explain the mathematics involved in transport processes during fire propagation as well as the empirical correlations for fire spread and fuel burning rates in detail.

ABOUT INSTRUCTOR :

Prof. V. Raghavan obtained his PhD degree in Mechanical Engineering from Indian Institute of Technology Madras (IITM), Chennai, India. He did his post-doctoral research in the Department of Mechanical Engineering at the University of Nebraska-Lincoln, USA. He joined IITM in 2007 as an Assistant Professor in the Department of Mechanical Engineering. He is currently working as a professor. He teaches courses such as Thermodynamics, Applied Thermal Engineering, Fundamentals of Combustion, Theory of Fire Propagation, Combustion Technology, etc. His areas of research include evaporation and combustion of liquid fuel droplets, laminar flames, fire modeling, CFD for reacting flows, flame spread and liquid fuel pool combustion, and coal gasification.

COURSE PLAN :

Week 1: Basics of Fires

Week 2: Thermodynamics of Fire Calculations

Week 3: Review of premixed and diffusion flames

Week 4: Burning of liquid fuels

Week 5: Continuation : Burning of liquid fuels

Week 6: Burning of solid fuels

Week 7: Continuation : Burning of solid fuels

Week 8: Analysis of fire plumes

Week 9: Enclosure fires

Week 10: Continuation : Enclosure fires

Week 11: Introduction to dust ignition, dust explosion and forest fires

Week 12: Fire safety aspects