



SHORT COURSE ON

STRUCTURAL FIRE ENGINEERING



*22-26 May, 2023,
Dept. of Civil Engineering,
IISc Bangalore, India*

SPEAKERS

1. **Professor Venkatesh Kodur** [Michigan State University, East Lansing & INFOSYS Distinguished Visiting Chair Professor, IISc]
2. **Professor Ananth Ramaswamy** [Department of Civil Engineering, IISc]
3. **Professor C S Manohar** [Department of Civil Engineering, IISc] [Course Coordinator]

OBJECTIVES

- How does the event of fire result in loads on the structural system?
- What makes modern construction materials and structures to be more vulnerable to fire hazard?
- What are the basic fire protection measures to be provided for mitigating fire hazards in built infrastructure?
- How to model the thermomechanical behavior of typical structural elements/systems when exposed to fire-induced loads? How do structures fail during the event of a fire?
- How is the fire load characterized (as a time-temperature curve) for the purpose of structural analysis?
- How to mitigate the effect of fire-induced loads by structural design?
- How do typical engineering materials (such as concrete and steel, for example) behave at elevated temperatures?
- How do fire engineering laboratories function?
- How to assess fire-damaged structures and devise repair measures?

Registration

This course can be attended only by registration. Registration will be accepted on first-come first-serve basis.

Registration Deadline: 12th May 2023

Registration link

<https://iisc.online/shortterm/home.html>

Course content

- 1.Fire hazard in-built infrastructure. Role of structural engineering in fire safety. Overview of codes and standards.
- 2.Review of laws of thermodynamics and principles of heat transfer.
- 3.Review of equations of thermoelasticity. Behavior of beams and plates under elevated temperature. Thermal buckling.
- 4.Fire growth and severity. Fire development in a compartment. Time-temperature relations.
- 5.Review of material constitutive modes at elevated temperature. Fireproofing materials and their properties.
- 6.Strategies for enhancing fire performance modern construction materials and structures.
- 7.Finite element modeling of thermo-mechanical behavior of engineering structures under fire loads.
- 8.Fire resistance evaluation through testing and calculation methods.
- 9.Behavior of steel and concrete structures under fire.
- 10.Fire problems in bridges and tunnels.
- 11.Residual capacity of fire-damaged structures.
- 12.Treatment of uncertainties in problems of structural fire engineering.

Course fees:

- 1.Faculty from NITs and academia: INR 10000.00 + 18% GST
- 2.Researchers/Practitioners from R&D labs and industry: INR 15000.00 + 18% GST
- 3.Graduate students: INR 7500.00 + 18% GST

The course fee includes expenses towards course material, refreshments and lunch during the course and does not include expenses towards travel, accommodation, breakfast, and dinner. Limited on campus accommodations at the Hoysala Guesthouse are available (on payment basis) and these will be provided by the Centre for Continuing Education on first come first served basis.