

# PMRF-ISSS Teaching Programme

Prime Minister Research Fellowship students' teaching requirement facilitated by the Institute of Smart Structures and Systems



Module PMRF-ISSS010/2023

## Natural Convection heat transfer and Diffusion mass transfer

### Name of the PMRF student

Sabareesh Vijayakumar , IIT Palakkad

### Required background of the students taught

Any learner who has very basic understanding of heat transfer and thermodynamics

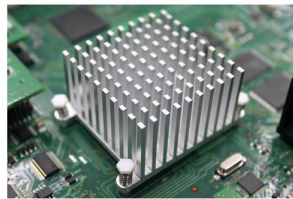
### Online session coordinator

Will be chosen from the list of registrants

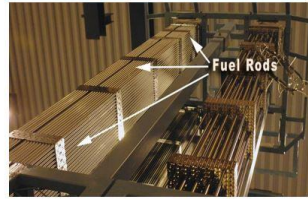
#### Examples of Free convection



a) Cooling of Coffee cup



b) Cooling of electronic chip



c) Cooling of Nuclear Reactor rods

#### Examples of diffusion mass transfer



a) Deodorant spraying



b) Evaporation of water in lakes



c) Penetration of water into soil

### Details of the content of the module

The course will be useful to learners interested in heat and mass transfer which forms the basis of many real world applications. These sessions are planned to be a **problem solving approach** rather than complete theoretical sessions so as to get a **good grip of the concepts**. The course aims to provide good clarity to the learner on the mentioned topics .

- Introduction to **Free convection** (1 hour)
- Mathematical Analysis of free convection (3 hour)
- **Problem discussions session- 1** (2 hour)
- Special cases of Free convection (2 hour)
- Combined free and forced convection (2 hour)
- **Problem discussion session-2** (2 hour)
- Introduction to **Diffusion mass transfer** (1 hour)
- Mathematical analysis of diffusion mass transfer (2 hour)
- **Problem discussion session-3** (2 hour)
- Evaporation and Sublimation in mass transfer (1 hour)
- **Problem discussion session- 4** (2 hour)
- Analogy between heat and mass transfer (1 hour)
- Summary and doubt clearing session (2 hour)

### Schedule of the module

Course Start date: 28 May, 2023 (Tentative)

Course Start date: 13 August, 2023 (Tentative)

Lecture and problem sessions will be uploaded regularly

Lecture days : Every Sunday

Time: 3 PM onwards

Meeting link : Will be shared later



Contact email ID: [issf.forum@gmail.com](mailto:issf.forum@gmail.com)

Registration link (Register here):

<https://forms.gle/H6wJjkZ7uZcntgm79>