PMRF-ISSS Teaching Programme

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

Module PMRF-ISSS036/2022

Electromagnetism

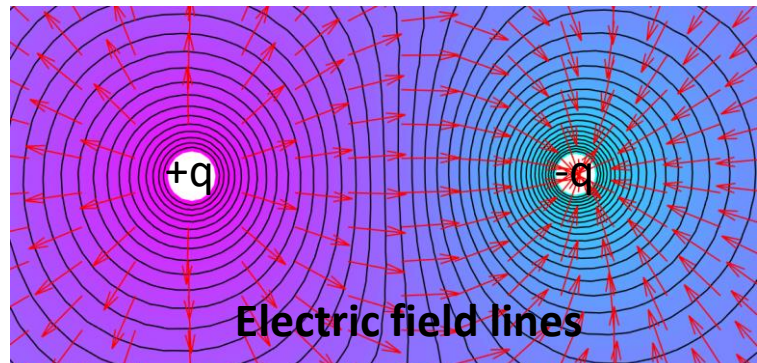**Name of the PMRF student**

JONNALAGADDA SUREKHA
PhD Scholar
Electrical Engineering Dept, IISc Bengaluru

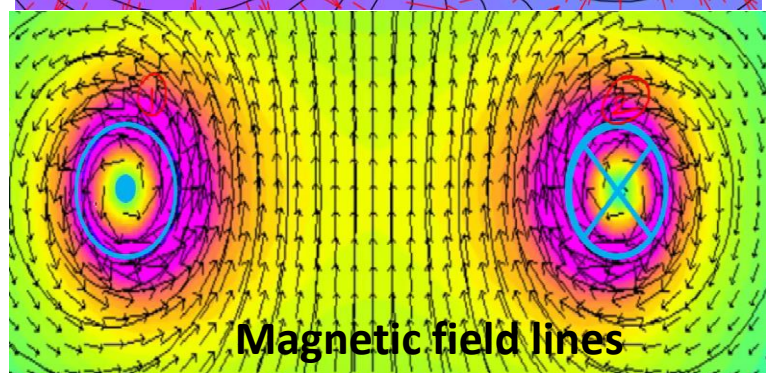**Required background of the students taught**

Undergraduate in Electrical/Electronics Engineering with some basics of vector Calculus

Online session coordinator

Will be chosen from the list of registrants

Electric field lines

Magnetic field lines

Details of the content of the module

This module will help to understand the basic principles of electromagnetic fields and their practical applications. Some MATLAB/FEMM simulations will provide much deeper insight into the subject.

1. **Review of Vector calculus**
2. **Electrostatics**
   - Coulombs Law, Gauss Law
   - Dielectrics and boundary conditions
   - Poisson's and Laplace's equation
3. **Magnetostatics**
   - Biot-Savart Law, Ampere Law
   - Vector potential
4. **Faraday's Law of Induction**
   - Self & Mutual Inductance calculations
5. **Maxwell's equations**
   - Electromagnetic waves
6. **Applications of Electromagnetism in Electrical engineering**
7. **Introduction to computational electrostatics**
   - Finite Difference, Finite Element (only 1D)

Note: This module will be in the form of lectures. Problem-solving sessions will follow each sub-module.

Schedule of the module

Course start date: 22nd October, 2022

Course end date: 11th December, 2022 (Tentatively)

Classes on: Saturday (7.00 - 8.30 pm)
              Sunday (4.00 - 5.30 pm)

Meeting link : Will be shared later

Link

Contact email ID: isss.forum@gmail.com

Registration link:

https://forms.gle/a4KQb4kHwQWBzeby6