PMRF-ISSS Teaching Programme

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

Module PMRF-ISSS036/2024

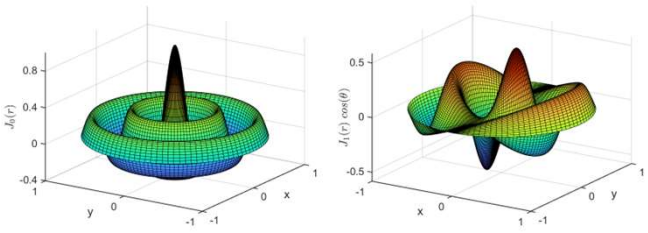
Series Solution of Differential Equations & Special Functions

Name of the PMRF student

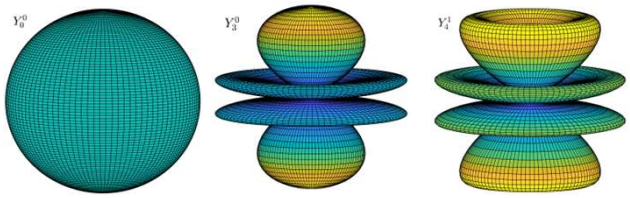
Goutam Manna

Required background of the students taught

Basic idea of calculus & differential equations



Normal modes of a circular membrane: Bessel functions



Angular part of electron wavefunction of H-atom: Spherical harmonics

Details of the content of the module

- Introduction

  Power series, Taylor series expansion, Radius of convergence, Index shifts, Differential Equations, Special Functions, etc.

- Series Solution of Differential Equations

  Recurrence relation, Ordinary point, Singular points, Frobenius method, etc.

- Legendre Function

  Legendre polynomials, Rodrigues' formula, Generating function, Orthonormality, Legendre series, Associate Legendre function, etc.

- Bessel Function

  Bessel function of first and second kind, Generating function, Orthonormality, Other kinds of Bessel function, etc.

- Hermite Function

  Hermite polynomials, Generating function, Recurrence relations, Orthonormality, etc.

- Laguerre Function

  Solutions, Generating functions, Orthonormality, etc.

Schedule of the module

Start Date: 10^{sth} March, 2024

End Date: 10thJune, 2024 (Tentative)

Schedule: Video lectures will be uploaded on every Sunday/ Monday

Number of Lectures: 35 (approx.)

Meeting link : Will be shared later

Link

Contact email ID: isss.forum@gmail.com

Registration link: https://forms.gle/XkCZ2rggst4hceRD6