PMRF-ISSS Teaching Programme

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

Module PMRF-ISSS034/2022

Introduction to Wave Propagation in Structure With MATLAB Coding

Name of the PMRF student

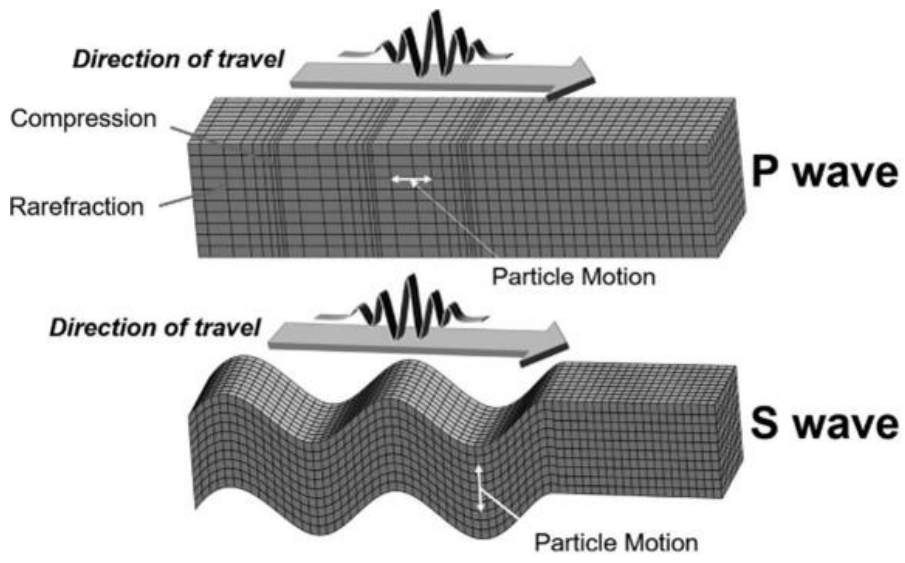
Ajeet Kumar Yadav

Required background of the students taught

3rd and 4th year of Students of the department of Aerospace, Civil, and Mechanical engineering department. Students must have done a course on Structural dynamics or the theory of vibration.

Online session coordinator

Will be chosen from the list of registrants



Reference: Computational Nondestructive Evaluation Handbook

Details of the content of the module

1. Introduction (Essential components of a wave, Need for wave propagation analysis in structures and material)
2. Introduction to integral Transforms
   - I. Fourier Transforms(Fourier Series, Discrete Fourier Transform)
   - II. Short-term Fourier Transform
   - III. Example problems using MATLAB
3. Introduction to wave Propagation
   - I. Concept of wave number, Group Speeds, and Phase Speeds
   - II. Wave propagation terminologies
4. Wave Propagation in One-Dimensional Isotropic Structural waveguide
   - I. Hamilton's principle
   - II. D' Alembert solution of wave equation
   - III. Longitudinal wave propagation in Rods
   - IV. Flexural wave propagation in Beams
   - V. Scattering of waves (Example problem)

Schedule of the module

Start Date- 2nd December 2022

Lecture Schedule-Every Friday, 3 - 4 PM

Number of Lecture-10-12

End date- tentatively by the first week of February

Meeting link : Will be shared later

Link

Contact email ID: isss.forum@gmail.com

Registration link: https://forms.gle/uHQoCgP5mWkSnf6Z6