FROM BASIC LINEAR VIBRATION TO ADVANCED NONLINEAR VIBRATION

Sponsored by Scheme for Promotion of Academic and Research Collaboration (SPARC)
Ministry of Education, Govt. of India

Swansea University
Prifysgol Abertawe

COURSE DESCRIPTION

This course provides a comprehensive exploration of vibrational theory, starting from the fundamental principles of linear vibration and extending to the complex field of nonlinear vibratory systems. Designed for both undergraduate and postgraduate students, the curriculum is structured to ensure a deep understanding of the basic principles while steadily introducing advanced concepts, applications, and research frontiers in nonlinear dynamics.

LEARNING OBJECTIVES

After this course, participants should be able to:

- Understand and apply the principles of linear vibration to simple mechanical systems.
- Analyse the behaviour of single and multi-degree -of-freedom systems under various conditions.
- Understand the transition from linear to nonlinear vibrational phenomena.
- Understand experimental modal analysis method. Solve nonlinear vibration problems using analytical and numerical methods.
- Solve nonlinear dynamics system using perturbation methods (Multiple Scale).

ABOUT SPARC

Scheme for Promotion of Academic and Research Collaboration (SPARC) aims at improving the research ecosystem of India's Higher Educational Institutions by facilitating academic and research collaborations between Indian Institutions and the best institutions in the world from 28 selected nations to jointly solve problems of national and/or international relevance.

COURSE OUTLINE

The overall course is divided into three parts or modules. This course is designed to extend benefits to all participants without affecting their daily schedules. Therefore, Saturdays and Sundays within this period would be ideal for people from all backgrounds. Only one-time registration is required for all the modules.

Part I: Fundamentals of Vibrations

1. Introductions to Mechanical Vibrations
2. Single-Degree-of -Freedom (SDOF) System
3. Multi-Degree-of-Freedom (MDOF) System

Part II: Intermediate Vibrations

1. Continuous System Vibration of strings, rods, beam
2. Modal analysis and testing

Part III: Advanced Nonlinear Vibrations

1. Nonlinear Dynamics: Nonlinear SDOF Systems
2. Nonlinear damping, stiffness, time domain solutions.
3. Perturbation methods for nonlinear system

Dates: 6th, 7th, 13th, 14th, 20th 21st, 27th & 28th January 2024 (Saturdays & Sundays)

SPARC
Scheme for Promotion of Academic and Research Collaboration

DELIVERY METHOD: Hybrid mode

Organizer

Patron: Prof. Dilip Kumar Baidya, Director
Chairman: Prof. N.B.D Choudhury, Dean(R&C)
Convener: Dr Sukumar Pati, HoD, ME Dept.

COURSE INSTRUCTOR

Prof. Hamed Haddad Khodaparast
Professor, Aerospace Engineering,
Swansea University, UK

TARGET AUDIENCE

Faculty members, Research Scholars, PG and UG Students, Persons from Industries and Research Institutes.

REGISTRATION FEE: NIL
REGISTRATION LINK

Click Here

VENUE

Seminar Hall
Mechanical Engineering
National Institute of Technology Silchar

CONTACT

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