



Title of Module:	FUNDAMENTALS OF VIBRATION
Code:	TME7028
Total time:	60 hours
Credit points:	4
Level:	MSc and PhD
Prerequisite:	none
Co-requisite:	none

AIMS:

The aim of this module is introduce students to the basic concepts of vibrational behaviour of the mechanical systems.

SYLLABUS:

Introduction to the signals and systems. Signal classification. Deterministic models of the signals: harmonic and periodic signals. Complex exponential models. Frequency response function of a simple physical systems. Fourier series. Continuous Fourier transform and its properties. Discrete Fourier transform. The effects of windowing. Vibration measurement and analysis. Lagrange equations and linearization. Assumed modes. Multi degree of freedom system (MDOFS). Response of the MDOFS; standard and generalized eigenvalue problems. Modal Parameters of the MDOFS: natural frequencies and mode shapes. Frequency response functions of the MDOFS.

BIBLIOGRAPHY:

- Fundamentals of Vibrations, Leonard Meirovitch, McGraw-Hill, 2002;
- Mechanical Vibrations (4th edition), Singiresu S. Rao, Prentice-Hall, 2003;
- Modal Testing – Theory, Practice and Applications (2nd edition), David J. Ewins, Research Studies Press, 2000;
- Signals & Systems, Alan V. Oppenheim, Alan S. Willsky, S. Hamid Nawab, Prentice-Hall, 1996;
- Principles and Techniques of Vibrations, Leonard Meirovitch, Prentice-Hall, 1997;
- Vibration for Engineers, Andrew D. Dimaragonas, Sam D. Haddad, Prentice-Hall, 1992.

RESPONSIBLE CO-ORDINATOR:

Prof. Carlos Alberto Bavastri.