

## DIM-GITI-432 Dynamic Analysis and Vibrations

**SEMESTER:** Fall  
**CREDITS:** 4.5 ECTS  
**LANGUAGE:** Spanish  
**DEGREES:** GITI

### Course overview

This course provides the basic principles of mechanical vibrations analysis. Starting with the basic concepts of mechanical vibrations and its application to one degree of freedom system the concepts of free vibrations and forced response are introduced as well as the fundamental concepts of vibrations isolations.

Time integration by Duhamel integral and step by step method and response in frequency domain are study previously to the introduction of linear vibrations in multi-degrees of freedom systems.

Finally, the course introduces the basics concepts of vibration in continuous systems.

### Prerequisites

Knowledge of Linear Algebra, Differential Equations, Mechanics of Materials and Structural Analysis

### Course contents

#### Theory:

1. Vibrations in mechanical systems
2. Free vibrations in one degree of freedom system
3. Harmonic excitation. Frequency response
4. Isolation
5. Integration methods
6. Vibrations in N degrees of freedom system. Modal reduction
7. Continuous systems

### Laboratory:

There will be two 2-hour sessions of practical session at laboratory

### Textbook

- Dynamics of Structures. R.W. Clough y J. Penzien. McGraw-Hill.
- Mechanical Vibration. S. Rao. Addison-Wesley

### Grading

The following conditions must be accomplished to pass the course:

- A minimum overall grade of at least 5 over 10
- A minimum grade in the final exam of 3 over 10

The overall grade is obtained as follows:

- Final exam 60%
- Group work and practical sessions 40%