

Excellence Course on Acoustics and Vibroacoustics in Transportation Engineering

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The Doctoral School, in cooperation with the doctoral course in Mechanical Engineering, the MUL² group, the AIDAA Torino and the FULLCOMP project, is pleased to announce an Excellence Course on Multiscale Structural Mechanics is pleased to announce an excellence course on seminar on Acoustics and Vibroacoustics in Transportation Engineering.

Abstract

The main problems of the interior comfort in the transportation engineering will be read by introducing the basic concepts in acoustics and vibroacoustics. An integrated view of theoretical approaches, numerical models and experimental tools will be framed to present the modern engineering procedures and the main topics to be considered.

Venue: Sala Ferrari, DIMEAS

Dates:

05.02.2018 – 2 hours (10:00-12:00)

06.02.2018 – 4 hours (10:00-12:00; 14:00-16:00)

07.02.2018 – 4 hours (10:00-12:00; 14:00-16:00)

08.02.2018 – 2 hours (10:00-12:00)



Course overview

Part I: Presentation of the course

- A. Generalities on vibroacoustics
 - 1. problems
 - 2. tools
 - 3. types of excitation
- B. Overview of the state of the art: numerical and experimental methods

Part II: The piston-pipe system

Part III: Waves in solids and fluids

- A. Dispersive and non-Dispersive waves
- B. Governing equations and simple solutions
- C. Finite element solution: assembly of predictive linear finite element model

Part IV: Vibroacoustic solutions with FEA.

Part V: Introduction to the Energy Methods and Statistical Energy Analysis (SEA)

- A. Modal density
- B. Damping.
- C. Modal overlap factor

Part VI: From modes to the waves: the energy distribution approach (EDA)

Part VII: Simplified schemes in Classical SEA

Part VIII: Radiated acoustic power

- A. Radiation efficiency
- B. Transmission loss
- C. General radiator

Part IX: Turbulent boundary layer response

Part X: Management of num/exp campaigns and data synthesis.