

MG2812**Introduction to Acoustics: Industrial and Musical Acoustics**

Professor: Pierre-Étienne Gautier

Language of instruction: French – **Number of hours:** 36 – **ECTS:** 3

Prerequisites: It is recommended to have completed the course MG1300 or equivalent

Period: S8 Elective 11 March to June IN28IE4, SEP8IE4

Course Objectives

- ◇ Discover methods and tools used in acoustics through examples in industrial cases and musical acoustics
- ◇ Become familiar with the main models used in acoustics from an industrial point of view

Case studies will be presented by researchers and engineers from industry showing, whenever possible, parallel approaches for both musical and industrial applications. These cases will involve examples in sound synthesis and its applications.

On completion of the course, students should be able to

- ◇ understand basic problems in acoustics from an industrial perspective
- ◇ develop methods to solve these problems

Course Contents

- ◇ Introduction to acoustics , basic acoustic sources, waveguide propagation, room acoustics (P.-E. Gautier)
- ◇ Psychoacoustics (S. Meunier, LMA Marseille)
- ◇ Rolling and aerodynamic noise: applications to railway systems (P.-E. Gautier)
- ◇ Propagation: weather influence, ground effects , noise barriers
- ◇ Physics of instruments with bowing or striking strings (R. Caussé, IRCAM-Paris)
- ◇ Physical models of musical wind instruments (X, LAUM Le Mans)

Course Organization

Tutorials and exercises (integrated sessions): 33h, Exam: 2 hr+ oral 20 min

Teaching Material and Textbooks

Course reader (in French). slides from course

Evaluation

CFO: 2-hr written exam (coeff 0,6) and oral defense (20 min) of a team case study(coeff 0,4)