

Vibrations

Structural acoustics

IDENTIFICATION

CODE : GM-5-S2-EC-MERAY
ECTS : 3.0

HOURS

Lectures : 0.0 h
Seminars : 30.0 h
Laboratory : 0.0 h
Project : 0.0 h
Teacher-student
contact : 30.0 h
Personal work : 20.0 h
Total : 50.0 h

ASSESSMENT METHOD

Reports

TEACHING AIDS

Course materials; Tutorials

TEACHING LANGUAGE

French

CONTACT

M. LAULAGNET Bernard
bernard.laulagnet@insa-lyon.fr

AIMS

Mastering the formalisms involved in the acoustic radiation of vibrating structures: the integral formulation and the acoustic finite element methods and the ray tracing method.

CONTENT

Radiation of elementary sources, monopoles and dipoles, Radiation of an electrodynamic loudspeaker, Radiation of the plates in bending, notion of radiating modes, radiated power and radiation efficiency, Integral formulation of an external and internal problem, Finite Boundary element method, singular frequencies for the external problem, example of cavity plate problem, Acoustic finite elements and application for the description of the "PML" method, Perfect match layer. Ray tracing method, useful in the context of environmental acoustics to plot noise maps. Numerical simulation work with the commercial software ACTRAN. Use of Code Tympan, open source software of ray tracing.

BIBLIOGRAPHY

Rayonnement acoustique des structures. C. Lesueur ; Acoustics, A.D. Pierce; Phénomènes fondamentaux de l'acoustique linéaire, J.L Migeot, éditions Lavoisier

PRE-REQUISITE

GM-4-MEAVS-S2; GM-3-VIBAC-S2