Technology
Arts Sciences
TH Köln

Course
IAK - Acoustics for Engineers

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︿ General information

Long name	Acoustics for Engineers
Approving CModule	IAK_BaET, IAK_BaTIN
Responsible	Prof. Dr.-Ing. Christoph Pörschmann Professor Fakultät IME
Level	Bachelor
Semester in the year	winter semester
Duration	Semester
Hours in self-study	78
ECTS	5
Professors	Prof. Dr.-Ing. Christoph Pörschmann Professor Fakultät IME
Requirements	Basic knowledge mechanics knowledge time domain / frequency domain operations Calculations with real and imaginary values Basic knowledge integral and differential mathematics
Language	German
Separate final exam	Yes

Final exam

Details

Oral examination - graded

The students explain the application-related problems using simple examples, they explain and describe how they relate them to practical applications and which conditions must be observed. The students prove that they can relate these concepts independently to real value problems.

Minimum standard

The students need to illustrate simple relationships. The description is supported by the examiner.

Exam Type

Oral examination - graded

The students explain the application-related problems using simple examples, they explain and describe how they relate them to practical applications and which conditions must be observed. The students prove that they can relate these concepts independently to real value problems.

⌃ Lecture / Exercises

Learning goals

Knowledge

Introduction of the basic acoustic parameters
Sound pressure, sound velocity, flow, power
Logarithmic quantities and levels

Mechanical and acoustic vibration systems
Mechanical vibration systems
Acoustic vibration systems

Sound propagation in the room
Homogeneous plane wave
standing waves
resonance systems
diffraction, refraction, reflection

point sources
Behaviour of sound pressure and sound velocity
elementary radiator synthesis

Concepts of loudspeakers and microphones)
Principles of directional microphones
Electrodynamic microphones and headphones
Piezoelectric microphones and headphones
Dielectric microphones

absorbers
Porous Absorbers
Helmholtz resonators as absorbers
plate absorber

Skills

Analysis and description of systems with loudspeakers and microphones

Calculation and description of the entire sound propagation chain from the microphone via the mechanoelectric conversion, the transmission via a communication link as well as the conversion via an electromechanical transducer and the sound radiation.

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	2
Exercises (whole course)	1
Exercises (shared course)	0
Tutorial (voluntary)	0

Separate exam

⌃ Practical training

Learning goals

Knowledge

Simulation of the propagation of sound waves

Investigation of sound reflection on Kundt's tube

Analysis of eigenmodes

Skills

perform practical measurements based on described tasks

create functional measurement setups

prepare adequate documentation for measurements carried out

Evaluate and discuss measurement results

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Practical training	1
Tutorial (voluntary)	0

Separate exam