FSD3145 Measurement and Analysis of Sound and Vibration 9.0 credits

Mätningar och analys av ljud och vibrationer

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for FSD3145 valid from Autumn 2018

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

Basic knowledge in acoustics and signal analysis.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The aim of the course is to teach students basic knowledge of sound and vibration measurements as well as analyses. Physics behind the measurements will be emphasized throughout the course. After the course students shall be able to:

- Perform common acoustical measurements and better understand the physics behind the measurements.
- Design new measurements according to specific requirements.
- Improve the ability to analyze and to criticize measurement results.

Course contents

Theoretical background

1. Introduction
2. Some basic concepts in acoustics
3. Acoustical measurement instrumentation
4. Making acoustical measurements
5. Sound power
6. Vibration measurement instrumentation
7. Making vibration measurements
8. Reverberant time and free-field condition
9. Acoustical and structural damping, impedance
10. Air-borne and structure-borne sound transmission

Laboratory exercises

1. Basic acoustic measurements
2. Sound power measurements (at least three methods)
3. Basic vibration measurements, power injection method
4. Reverberation time, loss factor
5. Sound absorption and acoustic surface impedance
6. Structure-borne sound transmission loss

Research-related measurement task

Pick up a task related to your own research work and discuss the technique used and analyse the results obtained in detail.

Training of instruments

Besides the instruments used in the lab exercise, students have to have at least four hours training/practice of the main measurement system in MWL (Currently it is B&K Pulse system) if they haven't done that before (for students of the department only).

Course literature

Leping Feng, Acoustical Measurements, TRITA-AVE 2007:07, 5th print (2011)

Selected chapters from Cyril M. Harris, Handbook of Acoustical Measurements and Noise Control (3nd ed., 1998)

Examination

- TEN1 - Exam, 6.0 credits, grading scale: G
- PRO1 - Project work, 3.0 credits, grading scale: G

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Written examination

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.