



FSD3102 Material Acoustics II

5.0 credits

Materialakustik II

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

Establishment

Course syllabus for FSD3102 valid from Autumn 2020

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

Students are expected to have complete courses in basic numerical methods and finite element formulations, as well as basic acoustics.

Language of instruction

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

Intended learning outcomes

This individual course is aimed towards PhD students in technical acoustics.

After the course, the student should be able to:

- Formulate and critically review models for the fluid-structure interaction phenomena that govern the structural-acoustical behavior of a structure embedded in an inviscid medium.
- Describe mathematical and numerical models of elastic and acoustic interaction phenomena. In this part studies of methods for homogenisation as well as phenomenological scaling models used in qualitative descriptions of acoustic effects occurring at different levels of physical scales of relevance.
- Describe the different types of boundary and coupling conditions that control the interaction.
- Evaluate fluid-structure interaction phenomena through numerical simulations and analyse problems, using different types of solution techniques, e.g. transfer matrix, finite elements, etc.

Course contents

The objective of the course is to give a deeper understanding of the fluid-structure interaction controlling linear acoustics. In particular, the course will emphasize general phenomenological modelling, including computer-based formulations and procedures, and their mathematical models. Models will be studied at different levels of complexity, e.g. simplified analytical, wave decompositions, finite element solutions and other numerical approaches.

Relevant topics in fluid-structure interaction will be discussed, including a brief review of relevant scientific literature in the field. Emphasis is placed on interpretation and critical evaluation of results.

Examination

- PRO1 - Project, 5.0 credits, grading scale: P, F

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.

There is one examination moment, and it is comprised of a series of projects that will be completed throughout the course. The projects are to be reported in written and/or in oral form, following a scientific writing and/or presentation structure.

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.

Additional regulations

Instruction will be in the form of 2-3 lectures per week followed by assignments in the form of computer labs. Classical and recent publications in the field will be reviewed and discussed.