FSD3121 Flow Acoustics II 9.0 credits

Strömningsakustik II

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

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

Establishment

Course syllabus for FSD3121 valid from Autumn 2018

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

SG2215 Kompressibel strömning, SG3112 Turbulens, SD1120 Ljud och vibrationer.

Language of instruction

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

Intended learning outcomes

Students graduating from the course should:

- How a good understanding of the fundamental equations of fluid mechanics
- Be able to derive and describe assumptions and limitations for
- Lighthills equation (LE)
- Ffowcs-William Hawkings equation (FWHE)
- Vortex-sound theory (VST)
- Know about the use of LE, FWHE and VST to model and analyse aeroacoustic problems
- Understand the modelling of flow induced vibrations
- Understand network models for flow ducts and the modelling of whistling via linear stability analysis

Course contents

The fundamental equations of fluid mechanics. Reciprocity. General solutions to the inhomogeneous wave equation. Compact Greens functions. Acoustic energy. Aerodynamic sound in unbounded flows. Sound generation in a fluid with rigid boundaries. Sound generation in a fluid with flexible boundaries. Interaction of sound with solid structures. Resonant and unstable systems.

Course literature

Howe - Acoustics and Fluid Structure Interactions, Cambridge UP

Examination

- TEN1 - Exam, 9.0 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.

Oral 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.