SD2140 Vibro Acoustics 8.0 credits

Strukturakustik

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

Establishment

Course syllabus for SD2140 valid from Autumn 2021

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

Completed course SE1010 HSolid Mechanics

Completed course SF1633 Differential Equations I

Completed course SG1130 Mechanics I

Completed course SG1140 Mechanics II

Language of instruction

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

Intended learning outcomes

Vibrations are often generated by dynamical and acoustical forces exciting large complex constructions. The aim of the course is to illustrate how these disturbances are excited and how the mechanical energy is transmitted by various wave types in and between structures, how various wave types interact and finally how acoustical energy is radiated from a structure to a surrounding fluid.

Students graduating from the course shall be able to:

- Explain free and forced vibrations of a system
- Discuss and explain how a structure can be excited
- Discuss models for energy flow between structural elements
- Explain the response of a structure excited by a harmonic or random forces
- Explain kinetic and potential energy of a structure as function of the input power to the system
- Discuss some possible methods for the reduction of the transmission of structure-borne sound to a mechanical system
- Use some different methods for the prediction of the response of a structure

Course contents

Wave types in solids. Excitation of vibrations. Modes of vibrations in solids. The mobility concept. Wave propagation and attenuation. Transmission between structures. Acoustical radiation from transmission through structures. Prediction models.

Examination

- TEN1 - Examination, 8.0 credits, grading scale: A, B, C, D, E, FX, 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.

Other requirements for final grade

Written examination (TEN1; 8 university credits).

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.