



SD2150 Experimental Structure Dynamics, Project Course 9.0 credits

Experimentell strukturdynamik, projektkurs

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 SD2150 valid from Autumn 2018

Grading scale

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

Education cycle

Second cycle

Main field of study

Language of instruction

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

Intended learning outcomes

After reading the course you shall,

- be able to analyse a real engineering problem using experimental modal analysis.

More specifically you shall be able to,

- account for details as well as the overall structure in the principles of experimental structure dynamics,
- choose an appropriate physical model to represent the test object,
- define and measure the input data required for the analysis,
- account for and use graphical and numerical curve-fitting techniques to extract structure dynamic model parameters,
- use an appropriate advanced model parameter extraction method implemented in a commercial software,
- illustrate the analysis results, i.e. the structure dynamic model,
- judge the reliability of the analysis results consciously and critically and
- report the results in a written report.

Course contents

Part 1. Theory: Theoretical basis. Measurement and analysis of dynamic properties of mechanical structures. Analytical and numerical methods to determine the modal parameters of mechanical structures.

Applications: Analysis of forced motion. Analysis of coupled structures. Sensitivity analysis. Structural modifications.

Computer exercise: Determination of beam vibration modes from experimental data.

Part 2. Laboratory exercise and project exercise: Instrumentation and experimental setup. Methods for data acquisition. Measurement of mobility functions. Estimation of frequency modal parameters. Evaluation and presentation of modal results.

Test structures: Reference object, perspex plate. Structure from industry.

Specific prerequisites

Basic courses in mathematics, mechanics.

Course literature

Carlsson, U. Experimental Structure Dynamics.

Examination

- LABA - Computer and Laboratory Exercises, 3.0 credits, grading scale: P, F
- LABB - Project, 3.0 credits, grading scale: P, F
- TENA - Oral Examination, 3.0 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.

Other requirements for final grade

Oral examination (TEN1; 3 university credits).

Approved laboratory exercise (LAB1; 3 university credits).

Approved project exercise (LAB2; 3 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.