SD2416 Structural Optimisation and Sandwich Design 6.0 credits

Strukturoptimering och sandwichdesign

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

Establishment

Course syllabus for SD2416 valid from Autumn 2007

Grading scale

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

Education cycle

Second cycle

Main field of study

Specific prerequisites

Base programme BD, M, P, T or equivalent. SF1861 Optimization for T, SD2411 Lightweight Structures and FEM and SD2413 Fibre Composites – Analysis and Design are recommended.

Language of instruction

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

Intended learning outcomes

After completion of the course the participants are expected to be able to:

- design sandwich beams and isotropic sandwich plates subjected to transverse loads and in-plane loads with respect to transverse displacement, strength, critical buckling load, natural frequencies and local buckling.
- determine when sandwich structures are favourable with respect to other structural concepts
- use optimisation methods, with and without constraints
- formulate a structural problem as an optimisation problem, and solve it
- discretise and perform finite element analysis of sandwich structures

Course contents

Fundamental beam theory for sandwich constructions. Plate theory (Reissner/Mindlin) for sandwich structures. Design considering failure criteria and finite element modelling of sandwich structures. Basic structural optimisation with applications in composite- and sandwich structures. Life cycle analysis, manufacturing and environmental aspects of sandwich structures. Compulsory elements include a hands-on laboration, and a programming- and design assignment.

Course literature

Zenkert, D. An Introduction to Sandwich Structures, 2006.

Compendium on structural optimisation.

Examination

- TEN1 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 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.

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

Other requirements for final grade

Assignment (LAB; 3 university credits) and written exam (TEN; 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.