SE2142 Contact Mechanics 9.0 credits

Kontaktmekanik

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

Establishment

Course syllabus for SE2142 valid from Autumn 2012

Grading scale

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

Education cycle

Second cycle

Main field of study

Technology

Specific prerequisites

- Basic course in Solid Mechanics: SE1010, SE1012, SE1020 or SE1055.
- SE1025 FEM for engineering applications

One of the advanced courses:

- SE2132 Applied Elasticity with FEM
- SE2126 Material Mechanics

or the equivalent.

Language of instruction

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

Intended learning outcomes

After the course the students should be able to analyse

- 2- and 3-dimensional elastic contact problems using classic contact mechanics: line- and point loads, Hertzian contacts;
- elastic problems with tangential-, sliding or rolling contacts;
- plastic contact problem, indentation;
- fatigue problems at contacts: fretting and rolling contact fatigue.
- Understand and be able to solve contact problems using numerical tools.
- Know the couplings between normal- and tangential loads and deformations.
- Know the relations for thermo-elastic contact, contact of rough surfaces, adhesion.

Course contents

The course will give a thorough treatment of elastic and plastic contact mechanics. The fatigue phenomena of fretting and rolling contact fatigue will be treated including dimensioning. Numerical treatment of contact problems.

Disposition

Lecture sessions, tutorials and own work with home assignments.

Course literature

- Johnson, KL.Contact mechanics, Cambridge University Press, 1987.
- Handouts.

Examination

- PRO1 - Project Assignment, 3.0 credits, grading scale: P, F
- TEN1 - Examination, 6.0 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.

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.