FSD3310 Wheel-Rail Contact 6.0 credits

Hjul-rälkontakt

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

Establishment

Course syllabus for FSD3310 valid from Spring 2018

Grading scale

G

Education cycle

Third cycle

Specific prerequisites

Undergraduate courses in mechanics, solid mechanics, and multibody dynamics.

Language of instruction

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

Intended learning outcomes

The course aims at the understanding of the conditions in the wheel-rail interface with phenomena related to the rolling contact. Theoretical background and approaches to numerical

solution in the context of dynamic simulations are addressed. The course contains lectures, seminars where the students present a selected topic, and home assignments.

Course contents

Introduction to rolling contact phenomena, overview of different contact theories, the normal contact problem – Hertz' theory, linear and non-linear theories for the tangential contact problem, wheel-rail contact in vehicle dynamics simulation software, contact geometry, deterioration mechanisms, influence of lubrication, non-stationary contact mechanics and the development of corrugation.

Course literature

K. L. Johnson: Contact Mechanics; J. J. Kalker: Three-dimensional elastic bodies in rolling contact

J. J. Kalker: Rolling Contact Phenomena - Linear Elasticity

S. Iwnicki: Handbook of railway vehicle dynamics

Recent research papers on selected topics.

Examination

- INL1 - Assignment, 6.0 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.

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

Other requirements for final grade

Compulsory lectures, seminar with presentation of a selected topic, home assignments.

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.