



FSD3200 Multi degree of Freedom Vehicle Dynamics 6.0 credits

Fordonsdynamik i flera frihetsgrader

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 FSD3200 valid from Autumn 2018

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

PhD student in the doctoral program Vehicle and Maritime Engineering.

Language of instruction

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

Intended learning outcomes

The student shall after the course be able to:

- Understand important concepts and tools within multibody systems
- Have knowledge about a number of methods to derive the equations of motions for MBS
- Have knowledge about a number of different simulation tools for MBS
- Have knowledge about MBS role in vehicle design and development
- Applied MBS on vehicle dynamic analysis
- Model, simulate and analyze a multibody system in simulation tool for MBS

Course contents

The course is intended to bridge the gap between the subject of classical vehicle dynamics and the general-purpose computer-based discipline known as multibody systems analysis (MBS).

The course starts with an introduction to the role of MBS in vehicle design and development. Then the underlying formulations in kinematics and dynamics required for a good understanding of multibody systems formulations is presented. Exercises to practice the theory and how it can be applied to vehicle dynamics analysis are performed.

Different computer tools are introduced and taught to the students.

A specific problem is defined and is solved as a project assignment by the student.

Disposition

- Lectures
- Discussion meetings where read literature is discussed
- Computer exercises
- Project assignment

Course literature

Lecture notes and material handed out during lectures and assignments.

Course literature such as:

M. Blundell and D. Harty. The multibody systems approach to vehicle dynamics. 2nd edition. Elsevier. ISBN: 9780080994253

M. Lesser. The analysis of complex nonlinear mechanical systems. A computer algebra assisted approach. World Scientific. ISBN-13: 978-9810234775

Equipment

No special equipment required.

Examination

- INL1 - Assignments, 6.0 credits, grading scale: P, 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

- Read the course material and discussed in group at the course meetings
- Performed the computer exercises
- Performed one individual project
- Present the project both orally and in a written report

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.