SD2231 Applied Vehicle Dynamics Control 7.5 credits

Tillämpad fordonsdynamikreglering

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

Establishment

The course syllabus is valid from Spring 2022 according to the school principal's decision: S-2022-0529 Decision date: 2022-02-24

Grading scale

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

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

Completed EL1000 Automatic control, general course.

English B / English 6

Completed Degree Project, First Level.

Language of instruction

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

Intended learning outcomes

The aim of the course is to give students both theoretical and practical experience of different vehicle dynamics control applications in longitudinal, lateral and vertical direction. At the end of the course students will have gained theoretical knowledge and practical experience in three different areas of vehicle dynamics control.

The students shall after the course be able to:

- design, implement and analyse traction and braking controls,
- design, implement and analyse state-estimation algorithms,
- design, implement and analyse vibration control for vehicle suspensions,
- design and implement the above as working correct models in Matlab and Simulink,
- write technical reports and present control designs.

Course contents

The course is a lab based course, meaning that the students will have theoretical sessions followed by practical lab assignments based on the theoretical sessions.

There will be three laboratory assignemnts in the course

1. Longitudinal Dynamics, Slip Control (Brake/Traction).
2. Lateral Dynamics, State estimation (Estimating vehicle side slip).
3. Vertical Dynamics, Control of active damping (Sky-hook/Ground-hook).

Examination

- LAB3 - Vertical Dynamics, Control of Active Damping, 2.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB2 - Lateral Dynamics, State estimation (Estimate Vehicle Slip), 2.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Longitudinal Dynamics, Slip Control (Brake/Traction), 2.5 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.

Grade A-F

Other requirements for final grade

Approved on all three compulsory laboratory reports.

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.