



EL2620 Nonlinear Control 7.5 credits

Olinjär reglering

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

Establishment

The official course syllabus is valid from the autumn semester 2021 in accordance with head of school decision: J-2021-0536. Decision date: 2021-04-15.

Grading scale

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

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

Knowledge in automatic control 6 higher education credits equivalent to completed course EL1000/EL1010/EL1110/EL1120.

Active participation in a course offering where the final examination is not yet reported in LADOK is considered equivalent to completion of the course.

Registering for a course is counted as active participation.

The term 'final examination' encompasses both the regular examination and the first re-examination.

Language of instruction

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

Intended learning outcomes

After passing the course, the student shall be able to

- formulate theory and definitions of important concepts in nonlinear control systems
- apply theory and methods within nonlinear control.

Course contents

The course treats control theory for nonlinear dynamic systems:

- analysis of input-output stability by means of e.g. the small gain theorem and the circle criterion
- analysis of stability of equilibrium points through linearization and Lyapunov methods
- analysis of stability for passive systems
- design and analysis of feedback control for nonlinear systems through linearization, feedback linearization and Lyapunov based methods
- design and analysis of high gain feedback, e.g. sliding mode control
- observers for nonlinear systems
- setpoint regulation control and setpoint tracking
- simulation of nonlinear dynamic models.

Examination

- INLA - Homework, 2.5 credits, grading scale: P, F
- INLB - Home work, 2.5 credits, grading scale: P, F
- TENT - Written exam, 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.

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.