HE1039 Control Engineering 6.0 credits

Reglerteknik

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

Establishment

Course syllabus for HE1039 valid from Spring 2019

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Knowledge corresponding to Signals, Systems and Transforms (HF1011)

Language of instruction

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

Intended learning outcomes

Learning outcomes

After completing this course students will be able to demonstrate competency in the following skills

- Define and interpret the fundamental concepts of systems, signals and models

- Set up mathematical models of signals and systems

- Describe and analyse continuous time and discrete time signals and systems in time and frequency domain

- Be able to understand and analyse closed loop systems regarding stability, steady state error, robustness and performance

- Understand, design and implement different controllers; eg PID-controllers, lead/lag compensators and pole placement controllers

- Understand implantation aspects such as alias, sampling and windup

Course contents

- Introduction to control systems

- Fundamental properties of linear systems in time and frequency domain

- Mathematical models of physical systems and signals

- Properties of closed loop systems, stability, steady state error, robustness and performance

- Design of different control strategies; PID and lead/lag filter

- Dynamics and stability of time discrete systems

- Designing time discrete controllers; eg PID and poleplacement

- Implementation aspects

- Modeling and simulation with MATLAB and Simulink

Course literature

Thomas Bertil. Modern Reglerteknik. Liber

Thomas Bertil. Modern Reglerteknik övningsbok. Liber

Examination

- TEN1 - Examination, 4.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Lab work, 2.0 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.

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

Written examination: TEN1; 4 cr

Lab work/Assignment: LAB1; 2 cr

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.