IE1304 Automatic Control 7.5 credits

Reglerteknik

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

Establishment

Course syllabus for IE1304 valid from Spring 2011

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Completed upper secondary education including documented proficiency in Swedish corresponding to Swedish B and English corresponding to English A. For students who received/will receive their final school grades after 31 December 2009, there is an additional entry requirement for mathematics as follows: documented proficiency in mathematics corresponding to Mathematics A. And the specific requirements of mathematics, physics and chemistry corresponding to Mathematics D, Physics B and Chemistry A.

Language of instruction

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

Intended learning outcomes

The student shall have necessary knowledge to be able to analyze and design a control system.

That means that for a passed examination the student shall be able to:

-explain basic concepts in control system.

-from a linear differential equation produce a dynamic model, both time continuous and time discrete, for a system.

-analyze a system, design a controller for the system.

-give examples of applications of automatic control in different technical systems and thereby improve static and dynamic properties for the system.

-use relevant terminology for automatic control in Swedish.

Course contents

The course concerns to highlight problems by servo control and constant control for processes.

The processes will be analyzed with respect to accuracy, speed and stability, from both time domain and frequency domain.

Simulation of processes is made by means of modern computation and simulation programs.

Concepts such as transfer functions and block diagrams will be treated. Diagram technique in the form of bode diagram will be gone through. Compensation's links (based on PID and pole placement methods) will be investigated to improve the properties for a control system. Realization of control systems.

Both analog and time discrete control is treated. To that end, operators based on Laplace and z-transforms will be used. Modeling dynamic system with state variables (state space).

An overview of automatic control, sensors and adaptivity.

Course literature

Modern Reglerteknik, Thomas, Bertil, LIBER, ISBN 91-47-09323-6

Modern Reglerteknik Övningsbok, Thomas, Bertil, LIBER, ISBN 91-47-09322-9

Examination

- TEN1 - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 3.0 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.

Other requirements for final grade

- LAB1 - Laboratory Work, 3.0 credits, grade scale: P, F
- TEN1 - Examination, 4.5 credits, grade scale: A, B, C, D, E, FX, F

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.