HM1006 Electrical and Control Engineering 7.5 credits

El- och styrteknik

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 HM1006 valid from Autumn 2009

Grading scale

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

Education cycle

First cycle

Main field of study

Electrical Engineering,Technology

Specific prerequisites

Course HN1900/6S2900, Engineering and Information Skills, or equivalent computer skills.

Language of instruction

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

Intended learning outcomes

The overall aim of the course is to provide a general knowledge of electrical and control technology. This is to be able to see opportunities in product development and automation of production. In addition to improving conditions for the technical communication between mechanical engineers and electrical engineers are created. This means that students may be better able to see the big picture of complex products or projects.
After the course the student will be in electromagnetism:
Calculate voltage, current, resistance and power in DC circuits with several stitches and multiple voltage sources
Measure voltage, current and resistance with the multimeter in both direct and alternating current circuits
Measuring DC and AC voltages on two channels simultaneously with the oscilloscope
Laboratory show phase angle between voltage and current in AC circuits
Explain how electricity is dangerous for the person and property
Explain how protective earthing and RCD operation schematic
Explain how DC and AC motor speed regulation and differences in maintenance between them
Explain how capacitors and coils affect AC
After the course the student should be in control technology:
Calculate the laboratory and show at least two amplifier circuits with operational amplifiers
Calculate, verify and demonstrate logic circuits with AND, OR, NOT, NAND and NOR
Explain the schematic feature at major flops
Be able to relax after pneumatic components diagram and explain the concepts of monostable, bistable

single acting cylinder, double acting cylinder, normally open and normally closed
Explain the schematic operation of a relay switch and latching
Suggest choice of sensors for measuring:
- End position
- The presence of various materials
- Temperature
- Gas pressure

Draw and use the function diagrams and path-time diagrams
Via personal computer to program a simple PLC control system, connect sensors and actuators and the Executive thereafter move into the operational
Describe the impact of integrating block and derivating blocks on a proportional control equipment

Course contents

Course literature

Bengt Haag:"Industriell systemteknik", Studentlitteratur, ISBN: 9789144008196.

Examination

- TEN1 - Written examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- ÖVN1 - Exercises, 4.5 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.

Other requirements for final grade

Passed written examination, grading scale: A-F
Passed exercises and laboratory, grading scale: A-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.