HE1004 Digital Electronics 7.5 credits

Digitalteknik

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 HE1004 valid from Autumn 2007

Grading scale

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

Education cycle

First cycle

Main field of study

Electrical Engineering,Technology

Specific prerequisites

To be able to profit by the course the student should have previous knowledge corresponding to "general and specific eligibility for the Bachelor of Science in Engineering, degree Programme in Electrical Engineering".

Language of instruction

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

Intended learning outcomes

The main purpose of the course is to provide good knowledge about the most common digital components and building blocks and how they are used, as well as to provide basic knowledge and training in the analysis and design of digital systems and to use modern hardware description language to implement digital circuits.

After completing the course, the student should be able to:

- do conversions between different number systems and to describe some different number and alphanumeric codes.
- explain the fundamental function of digital combinational and sequential building blocks.
- analyze and design combinational and sequential logic circuits.
- describe the behaviour of digital components and building blocks with hardware description language.
- simulate with computer tools the description of a digital system and to implement the design in programmable logic.
- do prototyping, testing and troubleshooting of digital systems.
- collect and to interpret information from data sheets and other information sources
- explain function, operation and layout of different memory systems.
- decide which converter to use depending on speed, resolution and economy.
- describe different types of programmable logic circuits.

Course contents

- Number systems and codes
- Binary arithmetic
- Logical operators and logical gates
- Boolean algebra
- Combinational networks
- Sequential networks
- VHDL Hardware description language
- Programmable logic circuits
- Semiconductor memories
- Digital and analogue converters

Course literature

Hemert, Digitala kretsar, Studentlitteratur, ISBN 91-44-01435-X
Text material from the institution

Examination

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

Written exam (TEN1; 3 cr.), grading A-F
Practical exercises (LAB1; 4,5 cr.), grading A-F
The final grade is based on the two parts. Grading 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.