IL2217 Digital Design with HDL 7.5 credits

Digital konstruktion med HDL

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

Establishment

Course syllabus for IL2217 valid from Autumn 2008

Grading scale

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

Education cycle

Second cycle

Main field of study

Specific prerequisites

The course requires good knowledge of digital design, corresponding to IE1204 Digital Design and basic knowledge about computer architecture, corresponding to IS1200 Computer Hardware Engineering.

Language of instruction

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

Intended learning outcomes

After the course the student shall be able to:

- model digital hardware using a hardware description language
- name and describe the different phases of the design flow for digital hardware
- point out the synthesizable subset of a hardware description language
- name different hardware description languages
- describe different types of target architectures for digital hardware
- design digital hardware for FPGAs
- explain the principle functionality of a hardware description language that models both analog and digital hardware
- use typical design techniques for combinational circuits, asynchronous and synchronous state machines and busses.

Course contents

- Introduction to techniques for system design and implementation
- Introduction to hardware description languages
- Modeling systems with VHDL
- Synthesizable subset of VHDL
- Alternatives to VHDL
- Introduction to VHDL-AMS (Analog and mixed-signal VHDL)
- Design and analysis of combinational and sequential components
- Target architectures
- FPGA synthesis
- Asynchronous versus synchronous state machines
- Microcontrollers and databusses

Course literature

Kursboken meddelas en månad innan kursstart på kurswebsidan.

Examination

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

Grading scale: A/B/C/D/E/Fx/F

Other requirements for final grade

- Written exam, 3.0 hp (TEN1: Grade A-F)
- Laboratory course, 4.5 hp (LAB1: Grade P, F)

The grade of the written exam (TEN1) is also the final grade of the course.

The lab course must be completed during the study year. If the course is not completed during the study year old laboratories are not counted anymore.

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.