



Course syllabus

Faculty of Technology

Department of Computer Science and Media Technology

1DT005 Digitalteknik, 7,5 högskolepoäng

Logic Circuit Design, 7.5 credits

Main field of study

Computer Engineering

Subject Group

Computer Science

Level of classification

First Level

Progression

G1N

Date of Ratification

Approved 2013-12-18

Revised 2017-11-13 by Faculty of Technology. Removal of ECTS-grading scale.

The course syllabus is valid from spring semester 2018

Prerequisites

General entry requirements and Mathematics 3c, Physics 2 or Mathematics D, Physics B (Field-specific entry requirements 8/A8).

Objectives

After completing the course the student should:

- be able to use the discrete mathematics in digital technology
- be familiar with digital technology fundamental circuits
- have knowledge of systematic methods of analysis and synthesis of combinatorial circuits and sequential circuits
- have the ability to handle computer-based synthesis tools
- have some knowledge of synthesis tools for VHDL (VHDL = Very High Speed Integrated Circuit Hardware Description Language.)
- have laboratory skills.

Content

The course covers the following topics:

Logic circuits and digital basic functions:

- number system and codes
- gates
- Boolean algebra
- latches and flip-flops

Combinational logic:

- Boolean functions
- truth tables
- minimization methods, Karnaugh maps
- racing, gambling
- adders, decoders, multiplexers (MUX), demultiplexers (DEMUX)
- synthesis with VHDL

Sequential Circuits:

- synchronous and asynchronous counters, registers
- state diagram, next state tables, transition tables
- Moore and Mealy state machines, state encoding
- synthesis and analysis of sequential circuits
- synthesis with VHDL

Type of Instruction

Lectures, assignments and concept related laboratory work. The laboratory work is mandatory. Mandatory preparatory assignments may occur for the laboration work.

Examination

The course is assessed with the grades U, 3, 4 or 5.

Assessment of student performance is made through written test and/or oral examinations and/or presentation of mandatory assignments.

Students who do not pass the regular examination will be offered retrials close to the regular examination.

Course Evaluation

During the course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed at the Faculty.

Required Reading and Additional Study Material

Required reading

New book, Digitalteknik, Studentlitteratur, 2014