SYLLABUS

Digital Design 7.5 credits D0011E

Digitalteknik

Course syllabus admitted: Autumn 2023 Sp 1 - Present

DECISION DATE
2021-02-16

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LULEÅ TEKNISKA UNIVERSITET

Digital Design 7.5 credits D0011E

Digitalteknik

First cycle, D0011E

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Inbyggda system	Electrical Engineering

Main field of study

Computer Science and Engineering

Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language and basic programming skills (D0009E Introduction to Programming).

Selection

The selection is based on 1-165 credits.

Course Aim

The student should be able to:

- Demonstrate knowledge of the disciplinary foundation of and proven experience in the field of digital design as well as insight into current research and development work. This is shown in laboratory and theoretical assignments.
- Demonstrate the ability to identify, formulate and deal with issues autonomously and creatively and to analyse and evaluate technological solutions. This is shown through designing and analyzing a digital arithmetic/logic unit (ALU).
- Demonstrate the ability to integrate knowledge critically and systematically as well as the ability to model, simulate, predict and evaluate sequences of events even with limited information. This is shown through designing and analyzing a simple yet modern processor from primitive components.
- Demonstrate the ability to identify the need for further knowledge and undertake ongoing development of his or her skills. This is shown in laboratory and project assignments which require gathering of information and critical evaluation.
- Demonstrate insight into research and development though understanding the possibilities and limitations of embedded systems technology. This is shown through laboratory and project assignments, highlighting the trade-offs between hard- and software.

Contents

Logical gates, combinatorial circuits, decomposition and methods for logic minimization. Finite state machines and sequential circuits. State encoding and minimization. Topological sort for circuit analysis: cycles, critical path, and evaluation. Binary arithmetics and logic, and computational structures. Abstraction of a micro computer in terms its components; e.g. registers, memory, peripheral circuits.

Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.
Instruction consists of lectures, (seminars) and assignments. During the course, home assignments may occur, which will give bonus points at the written exam following directly after the course.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided.

Written exam. Mandatory hand-in assignments and labs. Optional hand-in assignments for bonus points to the written exam.

Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term “unauthorized aids” refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

Overlap

The course D0011E is equal to SMD182

Course offered by

Department of Computer Science, Electrical and Space Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0002	Laboratory work	U G#	3	Mandatory	A07	
0003	Written exam	G U 3 4 5	4.5	Mandatory	S22	

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Last revised

by Jonny Johansson, HUL SRT 2021-02-16

Syllabus established

by the Department of Computer Science and Electrical Engineering 2007-02-28