

**SYLLABUS**

# **Digital and analog systems**

## **7.5 credits W0005E**

**Digitala och analoga system**

**Course syllabus admitted: Autumn 2023 Sp 1 - Present**

**DECISION DATE**  
**2017-02-15**

# Digital and analog systems 7.5 credits W0005E

## Digitala och analoga system

### First cycle, W0005E

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Inbyggda system	Electrical 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 + Swedish upper secondary school courses Physics 1b1 or 1a, Mathematics 2a or 2b or 2c.

## Selection

The selection is based on final school grades or Swedish Scholastic Aptitude Test.

## Course Aim

The student should after the course have basic knowledge of design and analysis of digital circuits and be familiar with the most common digital components and their properties  
be familiar with methods for building, testing and troubleshooting of digital systems  
have a basic knowledge of digital hardware of modern computer equipment.

The student should after the course have a basic knowledge of DC and AC theory. and:  
basic knowledge of the components and connecting general metrology skills  
basic knowledge of signal transmission in different media  
basic knowledge of semiconductors and applications using semiconductor devices.

## Contents

The course covers the following areas up

Digital circuits:

Input and output electrical properties  
Circuit families. Bus system. Data transfer. Memories.  
Digital Technology mathematical foundations.  
Number systems and codes. Boolean algebra.  
Peripherals for the network connection.  
Basic micro computer technology.  
Measurement in digital systems

Analog circuits:

Fundamental electrical circuits, components  
DC and AC  
Semiconductor Theory, diodes and applications, special diodes  
Power  
Bipolar transistors and transistor circuits, FET transistors, operational amplifiers, integrated amplifier, frequency characteristics  
Transmission lines, optical fiber cables, Signal conditioning, Crosstalk  
Measurement in analog systems

## Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

The course consists of lectures, group work and practicals. Compulsory attendance at practicals.

## 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.

Practicals of the course are graded, the average of these ratings is the final grade in the course. The instructions for each practical describes the tasks and problems to be solved for each grade.

## 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.

## Course offered by

Department of Computer Science, Electrical and Space Engineering

## Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0002	Laboratory work 1	G U 3 4 5	1	Mandatory	A17	
0003	Laboratory work 2	G U 3 4 5	1.5	Mandatory	A17	
0004	Laboratory work 3	G U 3 4 5	1	Mandatory	A17	
0005	Laboratory work 4	G U 3 4 5	1.5	Mandatory	A17	
0006	Laboratory work 5	G U 3 4 5	1.5	Mandatory	A17	
0007	Laboratory work 6	G U 3 4 5	1	Mandatory	A17	

## 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 2017-02-15

# Syllabus established

by Jonny Johansson, HUL SRT 2013-02-13