

SYLLABUS

Electronics 7.5 credits

E0007E

Elektronik

Course syllabus admitted: Autumn 2023 Sp 1 - Present

DECISION DATE
2021-11-04

Electronics 7.5 credits E0007E

Elektronik

First cycle, E0007E

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

Main field of study

Engineering Physics and 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 and Basic circuit theory; analysis of linear circuits in frequency and time domains, deal operational amplifiers, simulations using PSpice (E0003E Circuit Theory or E0012E General Introduction to Electrical Engineering or E0013E Fundamentals of Electrical Engineering). Knowledge in English, equivalent to English 6.

Selection

The selection is based on 1-165 credits.

Course Aim

To be able to design basic electronic circuits based on operational amplifiers, transistors, diodes, and passive components. Be able to measure on and describe the properties of these circuits. Be able to plan and conduct practical laboratory work on electronics. Learn to handle measurement equipment.

The student will after the course:

- Have some knowledge about the developments in electronics that has occurred over the past 50 years, and thus the scientific foundation upon which the field rests.

The student will also, through knowledge from exercises and tasks for design and calculation:

- based on proven experience in the field be able to construct simple electronic circuits based on operational amplifiers, transistors, diodes and passive components
- based on broad knowledge in the field be able to analyze the electronic circuits with mathematical analysis as well as based on an understanding of the science / physical laws that govern the operation of individual components,
- through deeper knowledge be able to describe the limitations electronic components such as operational amplifiers have in practical applications.

The student will, based on laboratory experiments involving preparations in the form of simulation and calculation, as well as practical work in groups in lab be able to:

- independently and with a holistic approach be able to perform experiments, where the task includes theoretical analysis, preparation of the experiments, as well as performing experiments,
- in practical laboratory exercises create, analyze and evaluate solutions to a problem within certain limits,
- plan and carry out laboratory tasks within specified parameters, and integrate knowledge of simulation tools with knowledge of circuits and component limitations,
- simulate and evaluate the behavior of electronic circuits using own knowledge, and using simulation tools for electronic design and have good knowledge of the approximations and assumptions that must often be made in the design of electronic circuits,
- interact in groups of two or three people in connection with the duties of experimental nature understand the need for additional knowledge in an area, and take responsibility to acquire that knowledge through such means as for example data sheets for components used in design and laboratory work.

Contents

Introduction to electronics, amplifier models, operational amplifiers, diodes, MOS transistors, BJT basic amplifier circuits, CMOS-logic. The simulation tool Cadence OrCad is used for preparations of laboratory work.

Realization

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

Lectures. Laborations with compulsory preparations consisting of design and simulations.

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.

Theoretical elements are examined via a written exam. Practical elements are examined via approved laboratory work.

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.

Remarks

The course is a base for studies of more advanced electronic building blocks such as filters, oscillators, integrated circuits etc.

Overlap

The course E0007E is equal to SME129

Course offered by

Department of Computer Science, Electrical and Space Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0004	Laboratory work	U G#	3	Mandatory	S18	
0005	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 2021-11-04

Syllabus established

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