SYLLABUS

Integrated Circuits 7.5 credits E7015E

Integrerade kretsar

Course syllabus admitted: Autumn 2023 Sp 1 - Present

DECISION DATE
2023-02-15

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LULEÅ TEKNISKA UNIVERSITET

Integrated Circuits 7.5 credits E7015E

Integrerade kretsar

Second cycle, E7015E

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

Entry requirements

Courses of at least 90 credits at first cycle including the following knowledge/course: E7014E Electronics II or similar, which means spoken and written technical English. Be able to work with circuit simulation tools. Good knowledge of the MOS transistor in its various modes of operation. Be able to understand and design basic electronic circuit blocks such as differential amplifier and current mirror. Be able to understand and do calculations on feedback systems, frequency dependence, and stability appliedto basic electronic circuit blocks.
Alternative:
Alternative to completed course can be corresponding knowledge acquired through work within the electronics sector.

Selection

The selection is based on 30-285 credits

Course Aim

To be able to design analog electronic integrated circuits in a CMOS process, both regarding schematics and layout. Be able to work with simulation and layout tools for analog integrated circuits. Be able to connect and co-simulate analog and digital integrated circuits (mixed-mode), Be able to describe basic steps in CMOS fabrication, and be able to understand and use process documentation and design rules. The student shall be able to describe the environmental effects of a CMOS process, and its role in a sustainable development of the technology.

Contents

CMOS fabrication steps. Repetition of standard electronic building blocks. Simulation and layout of analog integrated circuits. Design methodology for operational amplifiers. Noise in a CMOS process. A/D and D/A converter principles. Dynamic analog circuits. The CMOS manufacturing process, its environmental effects and role in sustainable development.

Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.
Lectures. Calculation assignments. Computer based laborations. Project.

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.
Mid-term exam, laborations and a project.

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 will not be given every year.

Transition terms

Sustainable development has been implemented in this course from Autumn semester 2011.

Course offered by

Department of Computer Science, Electrical and Space Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Mid-term exam	G U 3 4 5	3	Mandatory	A07	
0002	Project	G U 3 4 5	3	Mandatory	A07	
0003	Laboratory work	U G#	1.5	Mandatory	A07	

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 Robert Brännström 2023-02-15

Syllabus established

The syllabus was established by the Department of Computer Science and Electrical Engineering February 28, 2007 and is valid from Autumn semester 2007.