SYLLABUS

Signals and systems 7.5 credits S0004E

Signaler och system

Course syllabus admitted: Spring 2022 Sp 3 - Present

DECISION DATE
2021-02-16

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Signals and systems 7.5 credits S0004E

Signaler och system

First cycle, S0004E

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Signalbehandling	Computer Technology

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 courses of at least 60 credits at first cycle including the following knowledge/courses: Calculus, linear algebra, properties of the delta-function, ability in Matlab (equivalent to M0049M Linear Algebra and Differential Equations).

Selection

The selection is based on 1-165 credits.

Course Aim

The student should be able to
- Derive and describe how a linear and time-invariant (LTI) system affects input signal both in time and frequency
- Implement and simulate LTI systems
- Derive and describe the frequency content of a signal
- Derive, describe, and simulate how the placement of poles and zeros affect the properties of a system both in time and frequency
- Determine if a certain continuous-time signal can be sampled without loss of information.

Contents

An in-depth coverage of linear time invariant systems and the supporting mathematical theory. The course covers:
- Laplace transforms - Fourier series
- Fourier transform (both continuous and discrete time) - Convolution (both continuous and discrete time)
- Sampling and reconstruction
- Discrete-time processing of continuous-time signals
- Z-transform
- Analysis of LTI systems through poles and zeros

Mandatory computer assignments in Matlab is part of the course

Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.
Lectures, problem solving sessions, and take home labs

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 with differentiated grades and mandatory laboratory assignments.

Remarks

This course can not be combined with S0001E (Signal analysis)

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Transition terms

The course S0004E is equal to S0001E

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	A15	
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 Jonny Johansson, HUL SRT 2015-02-16

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