Signals and Systems

Programme course

6 credits

Signaler och system

TNG015

Valid from: 2017 Spring semester

Determined by
Board of Studies for Electrical Engineering, Physics and Mathematics

Date determined
2017-01-25

Main field of study
Electrical Engineering

Course level
First cycle

Advancement level
G2X

Course offered for
- Electronics Design Engineering, M Sc in Engineering
- Communication and Transportation Engineering, M Sc in Engineering
- Media Technology and Engineering, M Sc in Engineering

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Linear Algebra, Calculus in Several Variables, Transform Theory

Intended learning outcomes
After completing this course, students should be able to:
- explain the relation between timecontinuous and timediscret signals
- explain the difference between time- and frequency domains for signals
- apply Fourier-, Laplace- and Z-transforms for calculus
- design digital filters for signalprocessing
- describe the basic properties for adaptive signalprocessing
- to individually write an academic report in Swedish

Course content
Mathematical models of signals and signal processing systems. Properties such as linearity, causality, stationarity and periodicity. Spectral representation of signals using Fourier series and Fourier transforms. Spectrograms. Sampling and recontstruction; aliasing and folding. Linear systems and filter: analysis and synthesis using the z-transform. Written report in Swedish.

Teaching and working methods

The teaching is given in lectures, classes, and lab exercises. In the laboratory work an individually written report in Swedish is included.

Examination

LAB2	Laboratory course	2 credits	U, G
TEN5	Written examination	1 credits	U, 3, 4, 5
TEN4	Written examination	1 credits	U, 3, 4, 5
TEN3	Written examination	1 credits	U, 3, 4, 5
TEN2	Written examination	1 credits	U, 3, 4, 5
UPG2	Optional assignement	0 credits	U, G

Assessment and feed-back will be given by a language techer.

Grades

Four-grade scale, LiU, U, 3, 4, 5

Department

Institutionen för teknik och naturvetenskap

Director of Studies or equivalent

Adriana Serban

Examiner

Ole Pedersen

Course website and other links

http://www2.itn.liu.se/utbildning/kurs/

Education components

Preliminary scheduled hours: 50 h
Recommended self-study hours: 110 h

Course literature

Edward W. Kamen, Bonnie S. Heck: Fundamentals of signals and systems using MATLAB, Prentice-Hall, senaste editionen Teorikompendium med räkneuppgifter Laborationskompendium

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.