# Image and Audio Coding

## Programme course

## 6 credits

## Bild- och ljudkodning

## TSBK02

## Valid from: 2017 Spring semester

**Determined by**

Board of Studies for Electrical
Engineering, Physics and Mathematics

**Date determined**

2017-01-25

**Offered for the last time**

Spring semester 2022

**Replaced by**

TSBK38

# Main field of study

Electrical Engineering, Media Technology and Engineering

## Course level

Second cycle

## Advancement level

A1X

## Course offered for

- Computer Science and Engineering, M Sc in Engineering
- Industrial Engineering and Management - International, M Sc in Engineering
- Industrial Engineering and Management, M Sc in Engineering
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- Applied Physics and Electrical Engineering, M Sc in Engineering
- Communication Systems, Master's programme
- Information Technology, M Sc in Engineering
- Applied Physics and Electrical Engineering - International, 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

Signal Theory, Linear Algebra. Fourier transforms

## Intended learning outcomes

The course explains the principles behind modern techniques for communicating images and sound. Having fulfilled the course, the student has learned to analyze the performance of predictive and transform-based methods and is also able to explain the design criterias behind methods such as JPEG, MPEG for images and MP3, AAC for audio.

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## Course content

Statistical signal models and Entropy. Lossless coding. Performance bounds when coding analogue signals. Sampling and quantisation. PCM, predictive coding, transform coding, wavelet coding. LPC, CELP and model-based coding. Standardised methods for pictures and sound (JPEG, MPEG, MP3, AAC). Video distribution over networks.

## Teaching and working methods

The course consists of lectures, tutorials, and laborations.

## Examination

| | | | |
|------|---------------------|-------------|------------|
| LAB1 | Laboratory work     | 1.5 credits | U, G       |
| TEN1 | Written examination | 4.5 credits | U, 3, 4, 5 |

## Grades

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

## Other information

Supplementary courses: Project courses or research-oriented courses in the areas of media communication, mobil communication, medical image systems. The course is also suitable as a prerequisite for Master thesis studies in these fields.

## Department

Institutionen för systemteknik

## Director of Studies or equivalent

Klas Nordberg

## Examiner

Ingemar Ragnemalm

## Course website and other links

## Education components

Preliminary scheduled hours: 48 h
Recommended self-study hours: 112 h

# Course literature

Khalid Sayood, "Introduction to Data Compression", ISBN 978-0-12-415796-5

# 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.