



# DT1174 Sound as an Information Medium 9.0 credits

## Ljud som informationsbärare

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

## Establishment

Course syllabus for DT1174 valid from Autumn 2008

## Grading scale

A, B, C, D, E, FX, F

## Education cycle

First cycle

## Main field of study

Technology

## Specific prerequisites

## Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

## Intended learning outcomes

On completion of this course, you should be able to

- Describe the different levels of representation in acoustic communication, and categorise given phenomena and problems to the correct level,
- Make a qualified judgment as to whether communication by sound will work in different given circumstances, including distance, number of people, equipment, venue, programme material, ambient noise, user interfaces and storage media.

In order to reach these overall goals, you must be able to

- apply wave theory and concepts of elementary acoustics to describe how sound with different wavelengths from different sources will propagate in given rooms
- apply basic knowledge of the capabilities and limitations of human hearing in judging sounds for audibility, localisation, reproduction quality and health hazards
- make simple calculations of delays, RMS values, acoustic pressures, powers, intensities, levels in dB, and room acoustic metrics; and select formulas that are appropriate for solving a given problem
- describe at a functional level (such as block diagrams) how sound signals are represented and processed in analog and digital forms
- recognise common types of distortion and unwanted sounds by ear
- explain qualitatively what a spectrum of a sound shows and how the signal will be affected by filters
- describe the acoustic and electrical particularities of common types of microphones and loudspeakers
- account in general terms for how various features in speech and music signals are carriers of information
- describe current speech technology with regard to application areas, potential and limitations

## Course contents

### Disposition

The course is given in period 1 and 2. A small checkpoint exam is given at the end of period 1, and the main exam is given after period 2. Several individual assignments with practical measurement tasks are carried out during the course. The laboratory sessions take place in weeks 4-10 of the course.

### Course literature

S. Ternström (ed.): **Ljud som informationsbärare**, Compendium (in Swedish). KTH CSC-TMH. This book is updated and reprinted every year.

## Examination

- INL1 - Hand in Task, 2.0 credits, grading scale: P, F
- LAB1 - Laboratory work, 2.0 credits, grading scale: P, F
- TEN1 - Examination, 5.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

## Other requirements for final grade

Examination TEN 6 hp, laboratories LAB 1 hp, assignments PROJ 2 hp.

## Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.