

# **Physics of Sound**

Programme course

6 credits

Ljudfysik

TFYA65

Valid from: 2017 Spring semester

**Determined by**Board of Studies for Computer Science and Media Technology

**Date determined** 2017-01-25

# Main field of study

Applied Physics, Media Technology and Engineering

#### Course level

First cycle

#### Advancement level

G<sub>2</sub>X

#### Course offered for

• 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**

Signals and Systems, Transforms Theory

# Intended learning outcomes

The course aims at providing the students knowledge about sound and acoustics. After the course the student should be able to:

- Recognize, describe and solve simple problems of sound generation, propagation and other phenomena related to sound waves.
- Know and explain about the human perception of sound.
- Understand and explain the description of sound in the frequency domain
- Describe the function and properties of electronic circuits related to audio technology, and know how common audio related measurements are performed.
- Understand the basic concepts of room acoustic and explain how to influence the acoustics of a room.
- Know the basics of different audio formats, audio recording and post treatment as well as digital audio and signal processing.



#### Course content

Basic description of sound waves and physical phenomena related to them. Sound propagation and room acoustics. Psycho-acoustics: the human perception of sound. Properties of some different sound producers. Audio measurements and electronic circuits related to the sound. Introduction to digital sound, various digital audio formats and signal processing. The basics of sound recording and audio processing.

# Teaching and working methods

The course consists of lectures, laboratory experiments and a project assignment.

#### **Examination**

PRA1	Project assignment	1.5 credits	U, G
LAB1	Laboratory work	1.5 credits	U, G
TEN <sub>1</sub>	Written examination	3 credits	U, 3, 4, 5

#### Grades

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

### Department

Institutionen för fysik, kemi och biologi

# Director of Studies or equivalent

Magnus Johansson

#### **Examiner**

Per Sandström

### Course website and other links

http://www.ifm.liu.se/undergrad

# **Education components**

Preliminary scheduled hours: 40 h Recommended self-study hours: 120 h



# Course literature

#### **Additional literature**

#### **Books**

Alton F. Everest,  $Master\ Handbook\ of\ Acoustics$  Ken C. Pohlmann,  $Principles\ of\ Digital\ Audio$ 



#### **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.

