Oscillations and Mechanical Waves

Programme course

4 credits

Oscillationer och mekaniska vågor

TFYA82

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

Main field of study
Applied Physics, Physics, Biomedical Engineering

Course level
First cycle

Advancement level
G1X

Course offered for
- Biomedical 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
Calculus in one variable. Linear algebra.

Intended learning outcomes
The aim of the course is to give basic knowledge of oscillations and wave motion with applications from acoustics and medical technology. After successful examination the student should be able to solve basic problems related to;
mechanical waves including acoustics
Furthermore, the student should be able to;
apply physics modeling and experimental problem solving
perform measurements related to acoustics
present measurements, results and conclusions in a written report

Course content
Physics modeling and experimental problem solving.
Mechanical waves.
Harmonic oscillations, traveling waves, acoustics, superposition, interference.

Teaching and working methods

The course starts with an introduction to experimental problem solving via lectures and laboratory work. The lectures in wave physics are meant to give a basic understanding of the subject. During lectures the most important theory sections are presented together with some applied exercises. The knowledge is deepened and applied through special problem solving sessions. The course also contains laboratory work related to acoustics and medical technology.
The course runs over the first fart of the spring semester.

Examination

LAB2	Laboratory work	1.5 credits	U, G
LAB1	Laboratory work	1 credits	U, G
TEN1	Written examination	1.5 credits	U, 3, 4, 5

Grades

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

Other information

Supplementary courses: The course content is relevant for several upcoming courses on the programme (Optics - Theory and Application, Electronics, Measurement technology, Biomedical Engineering, Mechanics, Electromagnetism, Medical Images, Modern Physics, Transform Theory, Signals and systems etc.). Materials optics, Optoelectronics.

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/undergraduate/courses/list/index.xml?selection=Y&sort=ap

Education components

Preliminary scheduled hours: 0 h
Recommended self-study hours: 107 h

Course literature

Göran Jönsson, "Våglära och optik" (kapitel 1-10), 5:e upplagan (ISBN: 9789163389573) Övrigt material via kursens Lisamrum

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.