Engineering Mechanics

Programme course

6 credits

Mekanik

TFYY68

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, Physics

Course level

First cycle

Advancement level

G2X

Course offered for

- Computer Science 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

Calculus, Linear algebra

Intended learning outcomes

The course aims to provide knowledge of the basic relationships in classical mechanics, as well as provide an introduction to experimental problem solving. After completing the course the student should be able to:

- treat basic mechanical problems using laws of force and motion, kinetic energy and work and momentum equations and describe motion in both cartesian and polar coordinates in the plane
- formulate, simplify and solve simple mechanical problems from different approaches.
- apply physics modeling and experimental problem solving
- use dimensional analysis in order to formulate a mathematical description of a

physical phenomenon.
- present measurements, results and conclusions in a written report

Course content

Kinematics (linear and plane movement of particles), relative motion (uniform relative translation and rotation), Dynamics of particles (The law of inertia, mass, momentum, Newton's second and third laws, the concept of force, frictional forces, angular momentum, central forces), work and energy (work, effect, kinetical and potential energy, conservative forces, potential energy curves) the dynamic of particle systems (motion of the center of mass, momentum and kinetical energy for a system of particles, laws of conservation), dynamic of the rigid body(angular momentum and moment of inertia, the equation for rotation of a rigid body), oscillatory motion(simple harmonic motion, the mathematical- and physical pendulum).

Teaching and working methods

The seminars are treating principally important sectors and may contain simple demonstrations of mechanical course of events or the solution of typical examples.

Examination

TEN1	Written examination	U, 3, 4, 5	4 credits
LAB2	Laboratory work	U, G	1 credits
KTR1	Excercise	U, G	0 credits
UPG1	Hand-in assignment	U, G	1 credits

Grades

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

Department

Inst för fysik, kemi och biolog

Director of Studies or equivalent

Magnus Johansson

Examiner

Carl Hemmingsson

Course website and other links

http://www.ifm.liu.se/courses/tfyy68

Education components

Preliminary scheduled hours: 64 h
Recommended self-study hours: 96 h

Course literature

Additional literature

Books

Hemmingsson/Janzén/Ribberfors/Erickson, *Exempelsamling i Mekanik*Merkel m.fl., *Rapportskrivning: En lathund för studenter*Nordling/Österman, *Physics Handbook*Sandell, *Experimentell problemlösning*Young & Freedman, *University Physics with modern Physics* 13 ed

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.