

SYLLABUS

Physics 1 7.5 credits

F0004T

Fysik 1

Course syllabus admitted: Autumn 2023 Sp 1 - Present

DECISION DATE
2022-02-14

Physics 1 7.5 credits F0004T

Fysik 1

First cycle, F0004T

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Fysik	Physics

Main field of study

Engineering Physics and Electrical Engineering, Energy Engineering

Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language + Swedish upper secondary school courses Physics 2, Chemistry 1, Mathematics 3c or Mathematics D.

Selection

The selection is based on final school grades or Swedish Scholastic Aptitude Test.

Course Aim

After the course, the student should be able to:

- define fundamental concepts and relationships in mechanics and thermodynamics and explain their relationships.
- make free-body diagrams, analyze and calculate forces and torques of two-dimensional rigid bodies at rest, equilibrium.
- To formulate and solve mechanical problems involving particle motion in two dimensions, i.e. kinematics and kinetics.
- perform calorimetric calculations in solid, liquid and gas phase.
- understand and apply the first and second laws of thermodynamics for calculations with ideal gases in closed systems and idealized processes; calculate the thermal efficiency of simple cycles; knowledge of a few technical applications and relate them to the concept of sustainable development.
- understand the physical principles for heat transfer by conduction, radiation and convection, and solve simple problems.
- plan, implement and evaluate physics experiments and present the results in a written report.

Contents

- Experimental methods: i. e. planning and experimental work, analysis of experimental data, scientific writing
- dimension analysis
- forces and torques
- force systems
- equilibrium for simple and composite mechanical systems and applications such as for structures
- friction with applications in dynamics and statics (for example wedges)
- kinematics
- curvilinear motion, especially circular motion, n-t coordinates
- Newton's laws and applications
- work and energy, conservative forces
- virtual work
- momentum an collisions
- heat transfer
- laws of thermodynamics
- properties of matter
- cyclic processes and heat engines
- work and heat
- heat transfer
- entropy

Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

The teaching is given in form of lectures and compulsory laboratory work. The studente is encouraged to participate in the lectures and recitations, do the readings in the course literature, and practice problem solving on the suggested exercises. The lectures contain overview of theory, demonstrations and problem solving.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided. Written exam at the end of the course and approved laboratory course. Alternative forms of examination with a few part exams may occur.

Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term "unauthorized aids" refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

Overlap

The course F0004T is equal to F0060T, MTF096, F0061T, F0064T

Course offered by

Department of Engineering Sciences and Mathematics

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0004	Written exam/Alternativ Examination	G U 3 4 5	6	Mandatory	A21	
0005	Laboratory work Experimental methodology	U G#	1	Mandatory	A22	
0006	Laboratory work Thermodynamics	U G#	0.5	Mandatory	A22	

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Last revised

by Niklas Lehto, Programme Director 2022-02-14

Syllabus established

by Department of Applied Physics and Mechanical Engineering 2002-05-03