Course syllabus

Fysik
Physics

FAFA85, 6 credits, G1 (First Cycle)

Valid for: 2023/24
Faculty: Faculty of Engineering, LTH
Decided by: PLED N
Date of Decision: 2023-04-17

General Information

Compulsory for: IBYA1
Language of instruction: The course will be given in Swedish

Aim

The aim of the course is to give the student basic knowledge of experimental methods in physics, fluid physics and electricity. The experimental methods are used to analyse and build relations between different physical variables within all technical branches. In this course we apply the experimental methods on the fluid physics and electricity.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- be able to explain and use the concepts of temperature, pressure, partial pressure, relative humidity, heat and heat transfer and specific heat capacity.
- be able to define resistance, capacitance, inductance and impedance.

Competences and skills
For a passing grade the student must

- be able to both control and construct relations with dimensional analysis.
- be able to execute calculations on moving fluids with Bernoulli´s equation.
- be able to execute calculations on heat transfer through different materials and combination of materials in order to optimise consumption of power.
- be able to use fundamental concepts in electricity, both DC and AC.

- be able to measure, direct or indirect, the fundamental variables in electricity and be able to construct and analyse simple circuit diagram.
- be able to estimate the electric security and risks of a working place.

Contents

- Experimental methods in physics.
- Temperature, heat and heat transfer
- Pressure
- The ideal gas law, real gas law
- Fluid flow.
- Charge, voltage and potential difference.
- Resistors, capacitors and impedance.
- DC and AC.
- Phase shift and power correcting.
- Electricity and safety.
- Measurement of electrical variables.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)
Assessment: Written examination sets the final grade. Home assignment and experimental sessions must be completed.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Parts
Code: 0120. **Name:** Written Examination.
Credits: 4,5. **Grading scale:** TH. **Assessment:** Written examination. **Contents:** See contents above.
Code: 0220. **Name:** Laboratory Work.
Credits: 1,5. **Grading scale:** UG. **Assessment:** Approved written report after each experimental session. If the report is not approved during the course, the experimental session must be redone at the next available occasion. **Contents:** See the instructions for the experimental sessions.
Code: 0320. **Name:** Home Assignment.
Credits: 0. **Grading scale:** UG. **Assessment:** Approved assignment. If the assignment is not approved during the course, it must be redone at the next available occasion. **Contents:** Assignment Experimental methods.

Admission

The number of participants is limited to: No
The course overlaps following course/s: FAFA30, FAFA45, FAFA40, FAF604

Reading list

- Jönsson, Göran: Fysik i vätskor och gaser, 9:e upplagan. Teach Support , ISBN: 978-91-637-9826-9.
- Kompendium i Experimentell metodik.
- Jönsson, Göran: Tillämpad ellära, 2:a upplagan. Teach Support , ISBN: 978-91-639-4348-5.
- Laborationshandledningar.

Contact and other information

Course coordinator: Martin Magnusson, studierektorn@fysik.lu.se
Teacher: Frederik Ossler, frederik.ossler@forbr.lth.se

Teacher: Göran Frank, goran.frank@nuclear.lu.se
Further information: It is mandatory to attend the first lecture. One experimental session will be carried out at the Department of Physics in Lund. Some elements may be taught and assessed in English. This includes a maximum of 1 hp, in the form of laboratory sessions or written assignments.