



LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Fysik - elektricitetslära, gaser och vätskor **Physics: Electricity - Fluids**

FABA30, 8 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

Main field: Technology.

Compulsory for: R1, BR1

Language of instruction: The course will be given in Swedish

Aim

The student should develop his understanding of basic concepts within fluid mechanics, thermodynamics and electricity and magnetism necessary for his future role as a fire engineer and as needed in later courses. Many of the concepts introduced are also of great importance for a deeper understanding of the world around us and as parts of a general scientific knowledge. The course should also train the student in scientific problem-solving techniques and in writing presentations of experimental data and comparisons to physics models.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- understand the relation between experiments, models and theory
- be able to analyze thermodynamic processes and estimate their efficiencies
- be able to calculate the heat transport in media using different processes
- be able to calculate the strength of electric and magnetic fields in simple geometries
- be able to describe the electric system in buildings and its potential as a fire hazard.

Competences and skills

For a passing grade the student must

- be able to formulate and solve problems in physics using mathematical methods.
- be able to plan and carry-out physics experiments.
- be able to write a laboratory report that presents and analyzes experimental data in relation to physical models.

Judgement and approach

For a passing grade the student must

- be able to evaluate models and technical applications in a scientific manner
- increase his ability to work in a group towards a common goal

Contents

Experimental methodology: analysis and presentation of experimental data.

Electricity and magnetism: Electrostatics, electric and magnetic fields. Potential, electromagnetic induction, A.C. and D.C. circuits.

Physics of gases and fluids: Pressure, basic hydromechanics, ideal and real gases, phase transitions and the kinetic theory of gases. Thermodynamics, first and second law. Heat and cold engines. Heat transport through conduction, convection and radiation.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)

Assessment: It is mandatory to attend the first lecture in order to be admitted to the course. Written exam and completed experimental sessions.

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: 0114. **Name:** Physics.

Credits: 6. **Grading scale:** TH. **Assessment:** Written examination.

Code: 0214. **Name:** Laboratory Works.

Credits: 2. **Grading scale:** UG. **Assessment:** Passed laboratory works.

Admission

Assumed prior knowledge: FMAA05 Calculus in One Variable.

The number of participants is limited to: No

The course overlaps following course/s: FAF604, FAFA05, FAFA15, FAFA20, FAFA40, FAFA45, FAF121, FAFA65, FAFF25, FAFA70, FAFA75

Reading list

- Jönsson, Göran: Fysik i vätskor och gaser. Teach Support, 2018, ISBN: 9789163798269.
- Jönsson, Göran: Tillämpad Ellära. Teach Support, 2020, ISBN: 9789151936161.
- Petersson, R: Kompendium i Experimentell metodik med laborationshandledning. Lund 2012.

Contact and other information

Course coordinator: Mikael Elfman, Mikael.Elfman@nuclear.lu.se

Course coordinator: Moa Sporre, moa.sporre@nuclear.lu.se

Course homepage: <http://www.nuclear.lu.se/utbildning/obligatoriska-kurser/>

Further information: It is mandatory to attend the first lecture in order to be admitted to the course. Some elements may be taught and assessed in English. This includes a maximum of 1.5 hp, in the form of laboratory sessions or written assignments.