Faculty of Science

FYSA01, Physics 1: General Physics, 30 credits

Fysik 1: Allmän fysik, 30 högskolepoäng

First Cycle / Grundnivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2013-10-27 to be valid from 2013-10-28, spring semester 2014.

General Information

The course is a compulsory course for first-cycle studies for a Bachelor of Science in physics.

Language of instruction: Swedish and English
The course is given in English when necessary.

Main field of studies	*Depth of study relative to the degree requirements*
Physics	G1N, First cycle, has only upper-secondary level entry requirements

Learning outcomes

The aim of the course is that students should have acquired the following knowledge and skills on completion of the course:

- Handle measuring instruments and collection of data
- Evaluate and analyse collected measured values
- Describe, formulate and interpret physical models
- Carry out calculations for basic physical problems
- Describe in writing performed experiments
- Present projects orally

Course content

Module 1: Mechanics and electromagnetism, 15 credits
Experimental methodology, estimates of errors, problem-solving and methodology of presentation. The mechanics treats vectors, kinematics, dynamics and Newton's laws, inertia, work, energy, linear momentum and angular momentum, gravitation, rotational motion and harmonic oscillation.
The electromagnetism contains electrostatics, electric and magnetic fields, field theory, capacitance, resistance and inductance, electric and magnetic materials, circuit theory, induction and alternating current.

Module 2: Waves, energy and quantum physics, 13 credits
This module includes mechanical and electromagnetic waves, ray optics, wave optics, sound aggregation state, principles of thermodynamics, statistical physics, entropy, heat engines, special relativity theory, basic principles of quantum physics, wave mechanics. The Physics of atoms, solids, nuclei and particles.

Module 3: Experimental seminars, 2 credits
The module consists of experimental projects with oral presentation.

Course design

The teaching consists of lectures, group work, laboratory sessions, seminars and project work. Participation in laboratory sessions, seminars, project work and with it integrated teaching is compulsory.

Assessment

Examination is in the form of an written or oral exams during the different part of the course and in the form of laboratory reports and oral presentations of project.
Students who do not pass the regular exam are offered a re-examination shortly after the regular exam.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.
To pass the entire course, approved examination, approved laboratory reports, passed seminar presentation and participation in all compulsory parts are required..
The final grade is determined by weighing the results in the different parts of the course.

Entry requirements

General and courses corresponding to the following Swedish Upper Secondary School Programs: Chemistry 1, Mathematics 4, Physics 2.

Subcourses in FYSA01, Physics 1: General Physics

Applies from V15

1301 Mandatory Introduction, 1,0 hp
Grading scale: Fail, Pass
1302 Mechanics - Exam, 6,0 hp
Grading scale: Fail, Pass, Pass with distinction
1303 Electricity and Magnetism - Exam, 6,0 hp
Grading scale: Fail, Pass, Pass with distinction
1304 Optics and Waves - Exam, 4,5 hp
Grading scale: Fail, Pass, Pass with distinction
1305 Quantum Physics and Theory of Relativity - Exam, 4,5 hp
Grading scale: Fail, Pass, Pass with distinction
1306 Mechanics and Energy Processes - Laboratory Exercises, 1,5 hp
Grading scale: Fail, Pass, Pass with distinction
1307 Electricity and Magnetism - Laboratory Exercises, 1,0 hp
Grading scale: Fail, Pass, Pass with distinction
1308 Optics and Waves - Laboratory Exercises, 1,0 hp
Grading scale: Fail, Pass, Pass with distinction
1309 Quantum Physics - Laboratory Exercises, 1,5 hp
Grading scale: Fail, Pass, Pass with distinction
1310 Energy Processes - Theory, 1,0 hp
Grading scale: Fail, Pass
1311 Seminars, 2,0 hp
Grading scale: Fail, Pass, Pass with distinction
1312 Popular writing, 0,0 hp
Grading scale: Fail, Pass

Applies from H14

1301 Mandatory Introduction, 1,0 hp
Grading scale: Fail, Pass
1302 Mechanics - Exam, 6,0 hp
Grading scale: Fail, Pass, Pass with distinction
1303 Electricity and Magnetism - Exam, 6,0 hp
Grading scale: Fail, Pass, Pass with distinction
1304 Optics and Waves - Exam, 4,5 hp
Grading scale: Fail, Pass, Pass with distinction
1305 Quantum Physics and Theory of Relativity - Exam, 4,5 hp
Grading scale: Fail, Pass, Pass with distinction
1306 Mechanics and Energy Processes - Laboratory Exercises, 1,5 hp
Grading scale: Fail, Pass, Pass with distinction
1307 Electricity and Magnetism - Laboratory Exercises, 1,0 hp
Grading scale: Fail, Pass, Pass with distinction
1308 Optics and Waves - Laboratory Exercises, 1,0 hp
Grading scale: Fail, Pass, Pass with distinction
1309 Quantum Physics - Laboratory Exercises, 1,5 hp
Grading scale: Fail, Pass, Pass with distinction
1310 Energy Processes - Theory, 1,0 hp
Grading scale: Fail, Pass
1311 Seminars, 2,0 hp
Grading scale: Fail, Pass, Pass with distinction

1312 Popular writing, 0,0 hp
Grading scale: Fail, Pass