



Keilir

Miðstöð vísinda,
fræða og atvinnulífs

Physics 3A (EÐL3A06)

Preliminary University Studies Department

Course description

This course will cover the basics of oscillation and waves, thermodynamics, the study of electricity and optics.

Prerequisites (Required preparation):

Physics 1 (2A06)

Competence level

3

Credits

6

By the end of the course

The student has acquired knowledge and understanding of:

- Oscillation and waves: simple oscillation, long waves and transverse waves, wavelength, frequency and deflection, wave polarization, reflection from a fixed and loose obstacle
- Thermodynamics: heat and temperature, thermometers, the Kelvin scale. Ideal gas, relation between gas pressure and the average kinetic energy of gas molecules, the equation of state of an ideal gas. The first law of thermodynamics, heat capacity, specific heat, heat of fusion and vaporization and heat measurements. The second law of thermodynamics, heat engines, cooling engines and efficiency of heat engines. Insight is gained into the utilization of geothermal energy in Reykjanes, from the earth to the generation of electricity.

- Study of electricity: Electrical charges, electrical force, Coulombs Law of Electrical Force, electrical currents, voltage in the electrical field, elemental charge. Ohms Law, resistors, conductance, resistivity, temperature gradients, superconductivity. Simple electrical circuits.
- Optics: beams of light, reflection, refraction, refract and index of refraction, Snell's Law, total reflection, scattered light, Fermat's Law, converging lens, lens equation, real and virtual images and telescopes.

The student has acquired the skill to:

- present the material in question in a logical way, apply laws of physics and accurate procession methods.
- to apply relevant measurements, choose and use the concepts and units of measurements best suited at any given time, show accuracy in work and evaluate uncertainties in measurements.
- write down in an organized manner the progress of his/her work with repetition and the process of the experiment in mind as well as presenting his/her findings.
- use statistical presentation of findings, i.e. tables and charts, to show his/her ideas, deductions and results.

The student can use the knowledge and skill which he/she has acquired to:

- enter a study of demanding higher education, i.e. science, medicine, mathematics, engineering and economics
- understand the importance of research in physics and the effects of it on the history and development of physics
- realized the usefulness of the subject in relation to Icelandic context as well as providing a foundation for future study, participation in society and various workplaces

Course assessment

The course is assessed in a variety of ways, there among group work, individual assignments, quizzes and a final exam that will make up part of the final grade.