

# Physical Phenomena in the Environment

## (Nikola Holeček, Ph.D., Associate Prof.)

**Subject code:** PPE

**Year of study:** 2.

**Lectures:** 40

**Seminar work:** 10

**Lab work:** 20

**ECTS:** 7

### **Aims of the course:**

The student upgrades secondary school knowledge of physics in segments necessary to understand phenomena in the environment up to the level close to the university study level of natural sciences and technical studies. Exercises/tutorials within physical practical course enable the students to make real pictures about natural phenomena, while doing calculating exercises the student shall acquire abilities of quantitative analysis of physical phenomena. The students will acquire:

- understanding some physical phenomena,
- ability of planning simple measurements,
- ability of calculating analysis of measurement results.

### **Subject content:**

**Mechanics:** kinematics, particle dynamics, rigid bodies and body systems, elastomechanics, mechanics of liquids and gases, waves and sound waves.

**Heat and the energy laws:** heat as energy, specific heat, calorimetry, heat conduction, ideal and real gases, liquids, equation of state, thermodynamics, functions, diffusion in liquids and gases, thermodynamic, circular changes, heat engines.

**Electricity and magnetism:** Coulomb's law, electrical current and resistance, magnetic field caused by electric current, oscillating circuit, induction.

**Atomic physics:** structure of the atom, structure of the atomic nucleus, spectrum of the electromagnetic waves, visible light, microwaves, X-rays, alpha, beta and gamma decays, radiation detectors, nuclear reactions, fission and fusion of nuclei, nuclear reactor.

### **Teaching and learning methods:**

Lectures, cooperation and consultations, seminar work, calculating exercises, practice course of physics

### **Study obligations:**

written exam, completed exercises within practice course of physics and seminar work (production, presentation and defence).

### **Literature:**

1. Ivan Kuščer, A. Moljk, T. Kranjc, J. Peternej, Fizika za srednje šole, (*Physics for Secondary Schools*) DZS, 1999.
2. J. Strnad: Fizika, 1. del – mehanika, toplota, 2. del – elektrika in optika (*Physics - 1.part - Mechanics and Heat, Physics - 2.part - Electricity and Optics*), Društvo matematikov, fizikov in astronomov Slovenije, 1995.
3. Young and Freedman, University Physics with Modern Physics, Pearson International Edition, 2006