Modul type: Bechelor Physics / Master Programme for Professors of Physics

Module title: Electromagnetism

Module status: **Obligatory**

ECTS: **7**

Requirements: **none**

Learning objectives

Goal of the course is to gain understanding of fundamentals of electricity and magnetism, their some application and measurement method techniques.

Learning outcomes

On completion of this module, student should be able to understand basic ideas and reasoning behind the development of basics of electricity and magnetism and its application. Student should also be able to independently solving the theoretical problems and simpliest electrical circuits.

Syllabus

Theoretical instruction

Electric charge and electrostatic field in vacuum. Electrostatic field in presence of conductors and dielectrics. Electric field energy. Stationary and quasistationary currents. Properties of conductors. Electric circuits. Work and power of electric currents. Fields of moving charges. Stationary magnetic field in vacuum and in magnetics. Electromagnetic induction. Electromagnetic oscillations and AC circuits. Magnetic field energy. The electromagnetic field.

Solving selected numerical problems.

Practical instruction

Selected experimental exercises: Dielectric permittivity, Ohm's law, Wheatstone bridge, RC-circuit, RLC-circuit, Specific conductivity of fluids, Tangent compass.

Literature

1. Wolfgang K. H. Panofsky, Melba Phillips Classical Electricity and Magnetism: Second Edition (Dover Books on Physics) (2005).

2. A. N. Matveev, Electricity And Magnetism, Mir publishers Moscow (1986).

3. Richard P. Feynman, Robert B. Leighton, and Matthew Sands, The Feynman Lectures on Physics, Addison–Wesley (1964-2005).

Weekly teaching load				Other:
Lectures: 3	Exercises: 2	Other forms of teaching:	Student research: 1	