Study Program: Physics	
Type and level of studies: Bachelor studies	
Course name: Electromagnetism 1	
Lecturer**: Dragan M. Petković**	
Status: Compulsory	
ECTS: 8	
Attendance prerequisites:	

Course aims

Acquiring basic knowledge of electromagnetism and creating a basis for monitoring other subjects in the field of physics.

Course outcome

Introduction to the fundamental laws of electrostatics and the laws of constant DC flow. Solving specific experimental and computational problems in the field of electrostatics and direct currents. Skills in using electrical measuring instruments and device. Connecting basic knowledge from different areas of classical physics and their application. Preparation for understanding the laws of quantum physics.

Course content

Theoretical part

ELECTROSTATICS: Charge. Coulomb's law. Electric field, force lines, the flux of electric field vectors. Gauss's law. Electric field potential, equipotential surfaces. Electric dipole. Conductors in an electric field. Electrostatic induction. Capacitance and capacitors. Dielectrics in an electric field, polarization, generalized Gaussian law. Energy and forces in an electric field. Movement of a charged particle in an electric field. Constant DCs: Conduction of electric current, electric current density, mobility, resilience. Ohm's law. Superconductivity. Semiconductors. Conduction of electricity in gases. The continuity equation and Kirchhoff's first law. Resistors. Measuring current, voltage and resistance. Electromotive force. Jules' law, work and power. Simple electric circuit. The second Kirchhoff's law. Methods of solving problems involving electrical circuits. Electric circuits with capacitors. Current through the contact of two conductors. Electrolysis, electrochemical power sources.

Practical part

Computational exercises: solving computational problems in electrostatics and constant direct currents
Laboratory exercises: experimental exercises in electrostatics and constant direct currents.

Literature

1. В. Вучић, Д. Ивановић: Физика II, Грађевинска књига, Београд
2. П. Димитријевић: Физика – Електромагнетизам, Универзитет у Нишу, Ниш 2003.
3. Ј. Сурутка: Основи електротехнике I-IV, Академска мисао, Београд 2002.
4. Б. Павловић, Ц. Милојевић: Практикум рачунских вежбања из физике, Београд 1979.
5. И. Е. Иродов: Збирка Задатака из опште физике, Подгорица 1998.
6. М. Одаловић: Задаци из електромагнетизма и оптике, скрипта
7. Д. Петковић, М. Одаловић: Практикум лабораторијских вежби из електромагнетизма, скрипта

Number of active classes				Other classes
Lectures: 3	Practical classes: 2	Other forms of teaching:		

Teaching methods

Lectures (3 classes per week during the semester), experimental exercises at clinics (2 classes per week) during the semester), laboratory exercises at clinics (1 class per week) during the semester).

Assessment (maximum 100 points)			
Course assignments	**points**	Final exam	**points**
Lectures	10	written exam	30
Computational exercises	10	oral exam	30
Laboratory exercises	20	....	
Total	**40**		*60*

Two term tests which include theoretical questions and computational problems: 2x30=60 points.

Note: By passing both term tests (50% for both theory-related questions and computational problems) the student may obtain a grade before the official exam.