KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI
Projekt współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego
UNIA EUROPEJSKA
EUROPEJSKI FUNDUSZ SPOŁECZNY

Course title	ECTS code
Laboratory	13.2.0512

Name of unit administrating study

Faculty of Mathematics, Physics and Informatics

Studies

faculty	field of study		
Faculty of Mathematics, Physics and Informatics	Quantum Information Technology	type	all
		form	all
		specialty	all
		specialization	all

Teaching staff

dr Justyna Strankowska; prof. dr hab. Stanisław Pogorzelski; dr Justyna Barzowska; dr Anna Synak; prof. dr hab. Piotr Bojarski; dr hab. Marek Józefowicz; mgr Patryk Kamiński; dr hab. Aleksander Kubicki; dr Sławomir Werbowy; mgr Karolina Sudyk

Forms of classes, the realization and number of hours

Forms of classes

Laboratory classes

The realization of activities

classroom instruction, online classes

Number of hours

Laboratory classes: 45 hours

ECTS credits

2

The academic cycle

2022/2023 winter semester

Type of course

obligatory

Language of instruction

english

Teaching methods

- critical incident (case) analysis
- discussion
- group work
- problem solving
- project-based method (research, implementation, practical project)

Form and method of assessment and basic criteria for eveluation or examination requirements

Final evaluation

Graded credit

Assessment methods

- (mid-term / end-term) test
- oral course credit

The basic criteria for evaluation

Entry test covers the level of mastery of the material applicable to the given laboratory exercises in writing - 10-15 minutes. Performing the exercise is possible after passing the theory.
Completion of the laboratory exercises takes place after passing the theory and reports of all exercises.
The final grade is determined on the basis of the arithmetic mean of the grades obtained for individual forms of checking students' knowledge according to the indicator percentage ("UG Study Regulations").

Method of verifying required learning outcomes

established effect of education	entry tests	oral answers	exercises
W01	+	+	
U01	+	+	+
K01			+
K02			+
K03			+

Required courses and introductory requirements

A. Formal requirements

none

B. Prerequisites

none

Aims of education

Academic knowledge of the basic fields of physics: electrostatics, electrodynamics, magnetism, optics with special emphasis on physical phenomena. Showing physics as a fundamental science for the entire group of natural sciences - i.e. medicine, chemistry, biology

Course contents

Bibliography of literature

D. Halliday, R. Resnick, J. Walker, „Fundamentals of physics extended”
J. D. Jackson, „Classical electrodynamics”
John R. Taylor, „Introduction to analysis of measurment error”

The learning outcomes (for the field of study and specialization)

K_W01
K_U03
K_K01
K_K03
K_K07
K_K08

Knowledge

W01: The student knows:
the concept of electric charge and electric field;
Coulomb's law;
Gauss's law;
the concepts of field potential and potential energy;
concepts of current and intensity, EMF, resistance, Joule-Lenz heat;
microscopic current and resistance flow mechanisms;
Ohm's and Kirchhoff's laws;
the concept of magnetic field induction; and the Lorentz force concept;
the laws of Ampere and Biot-Savart;
the phenomenon of induction and self-induction (their applications);
Faraday's law and Lenz's rule;
operation of alternating current circuits;
electromagnetic waves and their basic properties;
basic laws of geometrical optics;
the meaning of Maxwell's equations as the foundation of electrodynamics;
methods of electrifying bodies and accumulating electric charges;
what methods can electrify bodies and how to accumulate electric charges
methods of producing direct and alternating electricity
effects of current flow through a specific medium
methods of generating a magnetic field,
the effects of the magnetic field on matter the action of the ammeter and AC and DC voltmeter, galvanic cell, transformer, generator and DC electric motor variable
how the picture tube and oscilloscope, accelerator and mass spectrograph work,
how to produce and pick up electromagnetic waves as well as how to use them to carry them information
(K_W01)

Skills

U01: The student can:
create and verify models of real-world phenomena, and using them to forecast events;
verify the credibility of information obtained from the outside on the basis of learned laws and principles of physics;
has the ability to critically select information;
plan and execute the experiment; develop and present the results of the experiment and be able to assess their credibility;
using computer tools, present the measurement results in the form of graphs, perform various mathematical operations on the measurement data (eg regression);
use basic measuring instruments.
(K_U03)

Social competence

Contact

justyna.strankowska@ug.edu.pl