Physics laboratory I - Optics, modern physics - course description

General information

Course name	Physics laboratory I - Optics, modern physics
Course ID	13.2-WF-FizP-PL-I-OMP-S17
Faculty	Faculty of Physics and Astronomy
Field of study	WFiA - oferta ERASMUS
Education profile	-
Level of studies	Erasmus programme
Beginning semester	winter term 2023/2024

Course information

Semester	2
ECTS credits to win	4
Available in specialities	Physics
Course type	obligatory
Teaching language	english
Author of syllabus	• dr Joanna Kalaga

Classes forms

The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Laboratory	45	3	-	-	Credit with grade

Aim of the course

Teaching the basics of metrology and introduction into the basics of experimental physics.

Prerequisites

- The knowledge of physics (optics, modern physics).

- The knowledge of metrology.

Scope

Terms and Physics Laboratory and safety and fire regulations.

List of exercises:

- The determination of the refractive index by measuring the apparent thickness.

- The determination of the refractive index of water by Abbe refractometer.

- The study of concentration of solution by saccharimeter SU-3.

- The determination of the constant of the diffraction grating using the laser.

- The determination of constant of the diffraction grating - method of the spectrometer.

- The determination of the refractive index by using a prism.

- The study of the photoelectric effect.

- The study of the triode. Determination of the characteristics of triode.

- The study of the diode.

- The determination of the electron work function.

- The study of the law of reflection and the law of refraction.

- The determination of the focal length of the lens.

Teaching methods

Laboratory exercise.

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form

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Student is able to perform the analysis of experimental results and formulate on the basis of relevant proposals, including proposals for the applicability of these results in medical physics, and evaluation of solution.		• an ongoing monitoring during classes • carrying out laboratory reports	• Laboratory
Student understands and explains physical phenomenon, knows statements and physical law's, can create a theoretical model and understands relation between experiment and theory.		• an ongoing monitoring during classes • carrying out laboratory reports	• Laboratory
Student is conscious how necessary is the development of professional and personal skills. Student using different information sources.		• an ongoing monitoring during classes • carrying out laboratory reports	• Laboratory
Student knows the basic rules of safety and health at work, recognize the threat and knows how to prevent them.		• an ongoing monitoring during classes	• Laboratory
Student knows and can use equipment physics laboratory and knows and can refer work rules of medical equipment to physics equipment.		• an ongoing monitoring during classes • carrying out laboratory reports	• Laboratory
Student can describes physical phenomena in simply way.		• an ongoing monitoring during classes • carrying out laboratory reports	• Laboratory
Student has a general knowledge of basic classical physics and methodology of physical measurement.		• an ongoing monitoring during classes • carrying out laboratory reports	• Laboratory
Student knows the methodology of physical measurements, can plan and realize simples physical measurements, can analyse of experimental data and knows how to present results.		• an ongoing monitoring during classes • carrying out laboratory reports	• Laboratory

Assignment conditions

The verification of background to the classes and the revision of the reports.

The grade obtained from every exercise consists of:

- grade from the preparation for classes 30%

- grade from the laboratory work 20%

- grade obtained from the report 50%

Recommended reading

[1] R. Resnick, D. Halliday, Fizyka, tom 2, Wydanie piętnaste, Wydawnictwo Naukowe PWN, Warszawa 2001.
[2] D. Halliday, R. Resnick, J. Walker, Podstawy fizyki, Wydawnictwo Naukowe PWN, Warszawa 2003.
[3] H. Szydłowski, Pracownia fizyczna wspomagana komputerem, Wydawnictwo Naukowe PWN, Warszawa 2003.
[4] H. Szydłowski, Pracownia fizyczna, Wydawnictwo Naukowe PWN, Warszawa 1994.

Further reading

[1] H. Szydłowski, *Wstęp do pracowni fizycznej*, Wydawnictwo Naukowe UAM, Poznań 1996.

[2] H. Szydłowski, *Niepewności w pomiarach. Międzynarodowe standardy w praktyce*, Wydawnictwo Naukowe UAM, Poznań 2001.

Notes

Modified by dr Marcin Kośmider (last modification: 06-02-2023 22:57)