COURSE DESCRIPTION CARD - SYLLABUS

Course name
I Physical Laboratory [S1FT1>IPF2]

Course

Field of study
Technical Physics

Year/Semester
2/3

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
0

Laboratory classes
30

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

3,00

Coordinators

dr Krzysztof Łapsa
krzysztof.lapsa@put.poznan.pl

Lecturers

Prerequisites

Knowledge and skills acquired at the lecture "Fundamentals of metrology" during the studies in the field of Technical Physics (1st stage of education, 1 semester). Theoretical knowledge of physics gained during the lecture "Experimental Physics" (1st stage of education, 2nd semester). The ability to solve simple physical problems based on the acquired knowledge, the ability to obtain information from indicated sources. Understanding the need to expand your competences.

Course objective

1. Developing students" skills in solving simple physical problems, performing simple experiments and analyzing the results based on the acquired knowledge. 2. Enabling experimental confirmation of basic physical phenomena and laws. 3. Shaping students" teamwork skills.

Course-related learning outcomes

Knowledge:
student:
1. has basic knowledge of metrology, knows and understands methods of measuring physical quantities and analyzing measurement results

2. has basic knowledge of experimental physics including mechanics, electricity, magnetism, electromagnetism, optics.

Skills:
student:
1. can, on the basis of literature, independently make a preliminary analysis of the results of laboratory measurements and draw conclusions
2. has the ability to self-study
3.can plan, carry out simple measurements, analyze and document the results of research on physical phenomena, assess the importance of the basic factors disturbing the measurement.

Social competences:
student:
1. is able to work responsibly on the assigned task independently and in a team
2. understands the need for continuous training.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Credit based on an oral or written response from the scope of content performed laboratory exercises and written reports. The prerequisite is to pass a minimum of 85% of the total planned for students exercises (positive assessment of the responses and reports).

Programme content

During the semester the student performs 13-14 exercises out of 24 exercise sets on subjects from various branches of physics such as mechanics, vibrating motion, wave motion, heat, electromagnetism, optics, and modern physics. Learns and practically uses issues related to the development of measurement results: arithmetic mean, standard deviation , normal distribution, determination of uncertainty of simple and complex measurements, linear regression method, graphic presentation of the measurement results. These contents are implemented as part of the student"s own work with support during classes and consultations.

Teaching methods

Preparation for laboratory exercises is based on the instructions contained in the scripts. Exercises are performed in pairs, student progress is monitored on an ongoing basis, the laboratory leader reviews reports, discusses calculations and conclusions.

Bibliography

Basic
1. K.Łapsa, Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Poznań 2008
2. S. Szuba, Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Poznań 2007
Additional
1. Fizyka dla szkół wyższych – free textbook available on the internet www.openstax.pl
2. D.Halliday, R.Resnick, J.Walker, Podstawy fizyki t 1-5, PWN Warszawa 2003
3. J. R. Taylor, Wstęp do analizy błędu pomiarowego, PWN, Warszawa 2018

Breakdown of average student's workload

	Hours	ECTS
Total workload	94	3,00
Classes requiring direct contact with the teacher	34	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	60	2,00