



COURSE DESCRIPTION CARD - SYLLABUS

Course name

I Physical Laboratory

Course

Field of study

Technical Physics

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

30

Tutorials

Projects/seminars

Number of credit points

Lecturers

Responsible for the course/lecturer:

Academic staff and PhD students of WIMiFT
(conducting classes)

Responsible for the course/lecturer:

Dr. Krzysztof Łapsa (guardian of the 1st Physics
Laboratory of WIMiFT)

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), basic knowledge of physics and mathematics (secondary school curriculum - basic level). It is expected to solve simple physical problems based on the possessed knowledge and the ability to obtain information from indicated sources. The student should also be ready to cooperate as part of a team.

Course objective

1. Acquaintance with the basic methodology of physical measurements and interpretation of real measurement results through the construction of simple mathematical models based on physical laws and theories.
2. Enabling experimental confirmation of basic phenomena and physical laws.
3. Developing 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, oscillating motion, wave motion, 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 and knows the possibilities of continuous training.

Methods for verifying learning outcomes and assessment criteria

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. S. Szuba, Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Po

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	3,0
Classes requiring direct contact with the teacher	34	1,0
Student's own work (literature studies, preparation for laboratory classes, preparation for tests, preparation of the report) ¹	60	2,0

¹ delete or add other activities as appropriate