

REGULATIONS

Physics Laboratory II (IIPF) and Laboratory of Physical Methods for Biology (PFMB)

I. Objectives and general information

1. The IIPF and PMFB laboratories are intended for students of physics, biophysics and mathematical and natural studies at the Faculty of Physics, Astronomy and Applied Computer Science of the Jagiellonian University.
2. The classes are aimed at:
 - development of a skill of carrying out physical measurements methodically,
 - learning various measurement techniques and handling advanced scientific/measurement apparatus,
 - learning how to construct and prove scientific hypotheses,
 - learning how to prepare and present measurement results in form of posters and scientific articles in line with applicable rules.
3. As part of the classes, students perform, among others, exercises in nuclear physics, condensed phase physics, atomic optics, nanotechnology, magnetic resonance and biophysics.
4. To be admitted to classes in the IIPF and PMFB, a student needs to obtain an entry in the USOS system **after having completed the Physics Laboratory I**.
5. The classes are held in the winter and summer semesters and comprise 90 hours per semester.
6. A student scores **6 ECTS** points per semester for obtaining credit in the laboratory.
7. Detailed information on the assignment of exercises, manuals for exercises and the current information concerning the laboratory is available at: www.2pf.if.uj.edu.pl and is provided via the USOS student service system: usosweb.uj.edu.pl.
8. Any comments and inquiries regarding the classes should be directed to the administrator, Mr. Artur Michalek - artur.michalek@uj.edu.pl or to the IIPF / PMFB manager.

II. Organization of classes and course of exercises

1. Laboratory classes are held for 12 weeks per semester, from 8:15 to 14:15 on Wednesdays (physics, SMP) and Fridays (biophysics) with half-hour breaks during classes.
2. Before each class, until 8:15 am, students are required to sign the attendance list. After this time, students receive **2 penalty points** for being late (deducted from the number of all points scored in each semester), and the teacher decides whether the late student is allowed to perform the exercise on that day.
3. During the classes, the orders of the Rector of the Jagiellonian University and the Dean of WFAIS regulating behavior related to preventing, counteracting and combating COVID-19 are in force.
4. During IIPF and PMFB, each student performs 8 exercises (4 exercises per semester), which are assigned to them at least one week in advance.
5. Each exercise covers 3 consecutive weeks of classes.
6. A detailed program of classes is determined by the tutor based on the manual of the exercise.
7. The condition for admitting to the implementation of the exercises is passing a test. The scope of the required material for the test is specified in the manual for each exercise.
8. The tutor may stop the exercise if he / she decides that the measurements are not carried out on his own or the way in which they are performed may damage the apparatus, or if the student disregards the health and safety rules. In such a case, a student will not receive credit for the exercise.

III. Principles of evaluation of exercises and laboratory completion

1. A grade received at the exercise comprises the following elements:
 - **knowledge**, scored on a scale of 0-10 with a weight of 30%,
 - **laboratory notebook and the quality of experimental work**, scored on a 0-10 scale with a weight of 30%
and
 - **report**, scored on a 0-10 scale with a weight of 40%.
2. The laboratory notebook, which is the property of the IIPF / PMFB, is received by the student during the first laboratory class and she/he is obliged to return it after completing all the exercises, under penalty of failing the course.
3. The report format must comply with the template available on the IIPF/PMFB laboratory's website.
4. The report in pdf format, together with the completed administration form, should be sent electronically within 2 weeks from the end of the exercise to: pracfiz2@o365groups.uj.edu.pl.
5. The report is assessed - after considering any comments from the tutor - within 2 weeks from the date of its submission.
6. In the event of exceeding the deadline for submitting the report or its evaluation, the number of points awarded for the exercise is reduced to **70%, 40% and 10%** in the case of delays up to one, two or more weeks, respectively.
7. Moreover, to pass the IIPF/PMFB, each student is required to make a poster of the exercise of their choice. The intention to make a specific poster should be reported to the tutor, and after its approval, also to the IIPF / PMFB administrator **by April 15, 2022**. Students who fail to comply with this obligation will be assigned the subject of the poster arbitrarily.
8. Posters are assessed on a scale of 0-5 points, and those that received at least 3 points take part in a special **Student Poster Session**, which is usually held at the end of the summer semester and takes the form of a competition. The authors of the best posters are awarded.
9. The laboratory manager, on request of the tutor, may award additional points to a student for the work performed for the benefit of the IIPF in overtime.
10. To receive credit in semester it is necessary to **complete all 4 exercises and prepare a poster**.
11. The laboratory grade is awarded based on the arithmetic mean of all the points obtained for all exercises (with relevant weights), poster and additional points decreased by penalty points and divided by the number of completed exercises and is equal to:

ocena	średnia liczba punktów	ocena	średnia liczba punktów
very good	> 8.80	satisfactory plus	5.20 – 6.39
good plus	7.60 – 8.79	satisfactory	4.00 – 5.19
good	6.40 – 7.59	unsatisfactory	< 4.00

12. Performing missed classes is possible only in emergencies upon consent of the laboratory manager. In such cases, the laboratory may change a previously assigned exercise, depending on apparatus and staff availability.

In all other matters which are not covered by the regulations, the manager of the IIPF and PMFB will issue decisions in consultation with the laboratory administrator and exercise tutor.

Kraków, 22.09.2021
dr hab. Krzysztof Dzierżęga, prof. UJ
manager of the IIPF and the PMFB

Notes on the evaluation components for the exercise

Knowledge, graded in the 0 - 10 scale (**weight factor 30%**)* .

The knowledge is assessed during the preliminary test which concerns mainly the knowledge of physical phenomena underlying a given experiment and method of carrying out measurements and operation of individual elements of the experimental design. Theoretical knowledge concerning the subject of exercise and its performance is checked not only during the preliminary test but also during all days of work. The scope of the required material is specified in the exercise instruction and additionally agreed with the tutor.

Laboratory notebook and experimental work, graded in the 0-10 scale (**weight 30%**).

The laboratory notebook should contain all the notes which will allow for recreation of the experimental design and measurement results. Notes concern drafts of the experimental design, important apparatus data, calculations and current measurement results, failures and breakdowns, initial result analysis.

The laboratory notebook will also contain all diagrams and tables. A checked A4 format notebook with numbered pages is the best notebook to create tables, to prepare sketches and diagrams.

Any diagram and photo printouts must be stuck in the laboratory notebook. Many data will be recorded in an electronic form but it is expected that only the most important or representative data will be presented in a form of a diagram. Groups of data saved on a computer disc must be clearly described in the laboratory notebook so that they are easy to identify.

The assessment of quality of the experimental work is subject to many factors, including:

- reliability of the experimental work,
- performing an experiment in accordance with the rules of good practice and degree of understanding the scientific bases of the rules,
- advancement of the planned experimental program,
- quality of obtained results,
- analysis and manner of minimizing measurement uncertainties,
- organization of consecutive stages of the experiment.

Report/final report/, graded in the 0-10 scale (**weight 40%**).

The report is an independent, author's study and description of experiments performed by a student and obtained results. Manner, language style and correctness of presented content should allow a tutor to verify the substantive aspect and numeric correctness of subsequent stages of the study of the results and their discussion. It is inadmissible to use other students' reports and measurement results. A report, apart from the **administrative page**, must contain the following parts and information:

- author and exercise title,
- abstract (**up to 200 words**) – in a clear and concise manner presents the measured physical values, measurement method, obtained result together with uncertainties and main conclusions,
- introduction – contains the objective of the exercise and a short description of the idea behind the measurement,
- theoretical part – contains a description of physical bases of a given exercise with equations used in the analysis of the measurement results. The scope of the part is agreed with the exercise tutor,
- measurement method and the experimental design – provides a detailed description of the measurement method and the experimental design together with explanation of the role of its components,
- results – provide a quantitative analysis of measurement results and their uncertainties with division into static and systematic uncertainties,
- conclusions and summary,
- references to all quotations.

* 0 points means lack of credit and is awarded in the event a student copies other students' results, is totally unprepared to the classes, in the event of gross negligence in observance of the Health and Safety Regulations, damage of the apparatus due to a student's fault, etc.