Rules for the Advanced lab Course

We expect all students to obey good scientific practise:

We have zero-tolerance policy towards plagiarism. Plagiarism is defined as any copying without attribution. For example: using paragraphs of the text found online, copying three sentences from a previous report, reproducing from a textbook, or getting a figure from a colleague, copying a few sentences from Wikipedia for a pre-experiment report. Any kind of plagiarism, either in pre-experiment or final reports may result in failing the course or worse (even if that happens only once)! All cases of plagiarism will be referred to course administrators and will be taken extremely seriously.

The course takes place during the semester on Wednesdays and for particular experiments in the first two weeks of the semester break. If the tutor agrees you may as an exception arrange a different day for a particular experiment.

BEFORE THE EXPERIMENT

Please send an Email with the **written introductory part** on the previous day of the experiment to the tutor.

The **written introductory part** should concisely describe the fundamental physics of the experiment. It should moreover contain a schematic draft of the experimental setup and the guidelines for the execution of the experiment. It should not exceed five pages in length, normally two pages are enough.
To prepare for the experiment, you should consult the **script** and the appropriate literature. You find an introduction to the experiments on https://wiki.physik.fu-berlin.de/fp/doku.php. In addition you find the the most relevant literature for each experiment in the library.

The supervisor can reject students **without sufficient written introductory part and knowledge of the basic ideas of the experiment**; he/she can reject them also **in case they come too late**. A compensatory appointment can be agreed upon discussion with the organizer responsible for the course.

DURING THE EXPERIMENT

The experiment begins usually at 9:00 - 10:00 h with a **preliminary discussion** with the supervisor of the experiment. If your introductory part is accepted by the supervisor you can use it as part of your report. Each student within a group should take part actively in this preparation process.

The **supervisor** instructs the students in operating the experimental equipment. The students are allowed to use it only after approval of the supervisor. During the execution of

the experiment the students should prepare clearly arranged data sheets which have to be attached to the final report.

The protocol should in principle be finished at the day of the experiment. It is worth pointing out that it is not the intention of the advanced lab course to force students to work on unfinished protocols at home for several days after the end of the experiment. The biggest part of the report should be completed during the preparation process so that it should be clear, e.g., which quantities are going to be measured and how they should be presented. After the end of the experiment the supervisor attests the proper execution of the experiment by **signing the participation paper**. This signature is mandatory.

AFTER THE EXPERIMENT

Each **experimental report or protocol** should clearly contain

a) the **name of the experiment**, dates, and the **names of the participants.**
b) a **short description** of the relevant questions and an explanation of the subjects of the experiment as well as the physical quantities to be measured. It should be originally drafted by the students. It should include answers to open questions from the script.
c) the **experimental data** (that have to be completely and well presented with their respective units) as well as the description of the evaluation procedure and used formulas. It should be possible to follow the procedure that leads to the final results. Original graphics and diagrams have to be included.
d) a **discussion** of the possible error sources affecting the results of the measurements and their causes. Students should learn where systematic errors occur and how they affect the measurements. For the representation of the experimental results it is necessary to calculate the errors, because experimental data without errors make no sense.
e) a **summary** of the results as a separate section. Here a discussion of the measurements and of the involved physical quantities can be included along with possible critiques concerning the experiment.

The report should not exceed **15 pages** in length.

The **reports** have to be handed in to the **supervisor within 14 days** after the end of the experiment. Protocols handed in later than two weeks after the experiment without proper justification will be considered as "not sufficient". Even in that case they have to be submitted to the tutors. Each group can prepare one common protocol, provided that each of the students contributes to and fully understands it. Separate protocols are also very welcome. Exceptions to this rule have to be **previously** authorized by the course organizer. In case one of the students in a group is not able to work on the protocol, the partner has to finish it alone.
The supervisor will correct the reports within seven days.

Three weeks after the experiment there will be a discussion between the supervisor and the students. This appointment needs to be agreed upon with the supervisor. The certification by the supervisor will be given only if the experiment has been well executed and fully understood. In case of any deficiencies, even in its appearance, the report will be returned once for corrections and amendments. No more than seven days can be allowed for that. If **four weeks after the experiment** the protocol has not been finished and approved, the experiment will be considered unsuccessful. In this case the students will have to carry out a different experiment. The final certification for the individual experiment will be given by the supervisor after the presentation of the complete and correct protocol.

CERTIFICATE

The final certificate of the advanced lab course as a whole will be provided by the course organizer, typically at the end of the semester.

Alternative experiments for not approved ones have to be carried out within the same semester. If the advanced lab course is not successfully completed, please contact the organizer for a possible partial approval.

Last updated: Kirill Bolotin, May 2016