Advanced Lab Course
Fortgeschrittenen-Praktikum (FP)

Universität Freiburg / Physikalisches Institut

(Summer/Fall 2019)

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Please always address e-mails to:

fp@physik.uni-freiburg.de

(In general, do not use individual addresses!)

Technical assistance: Holger Stützler

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holger.stuetzler@physik.uni-freiburg.de
Tel.: 5719 / 5968

Organisational overview

Current course schedule, contact details,…:

https://ilias.uni-freiburg.de/goto.php?target=crs_1293543&client_id=unifreiburg

Links to instructions and other details on experiments:

http://www.physik.uni-freiburg.de/studium/labore/fp/fpla (for FP LA)
http://www.physik.uni-freiburg.de/studium/labore/fp/fpedu (for FP M.Ed.)
http://www.physik.uni-freiburg.de/studium/labore/fp/fp1/ (for FP-1)
http://www.physik.uni-freiburg.de/studium/labore/fp/fp2/ (for FP-2)

Mandatory for participation

- Safety trainings are mandatory for students and assistants (only valid for 12 months)

- Without valid training <u>you can not participate</u> in the lab courses

- Next (and last) chance for safety training
  - Today, 25th of July 2019, this lecture hall
    - **15:30h** Radiation safety
    - **16:00h** Laser safety

- Students need to be officially enrolled at the University in the winter and summer term

Helpful for participation

- Introduction class into *ROOT*
  - Today, 25th of July 2019, this lecture hall
    - approx. 16:30h (David Hohn, david.hohn@physik.uni-freiburg.de);

- Introduction to Origin
  - Please see old notes (also attached to our Ilias page): http://omnibus.uni-freiburg.de/~phypra/fp/origin/

Advanced lab course experiments

Please get in contact with the assistants prior to class
(contact details on Ilias)

Experimental setups are located in:

- Gustav Mie building, 1st floor
- Gustav Mie building, ground floor (Laser spectroscopy and semiconductor detector)
- High rise building (Velocity map imaging)
- Gustav Mie building, 4th floor: Diamond

Distinguish between FP-I (short — 1.5 days) and
FP-II (long — 1-2 weeks) experiments

Access to experiments: Monday to Friday between 09:00-17:30h

NOTE:

- Other hours only after consulting with assistants or organizers
  - Make sure you are never alone, especially after hours!
- Make sure that students are supervised
- Rooms need to be locked after hours

Notes for assistants

- (One or) Two assistants are assigned to each experiment

- Subdivide teaching assignments with your colleague assistant for each experiment
  - Please inform us about your division of teaching of student groups
  - Also inform us about any changes in your assignments

- Supervision of students needs to be ensured at all times!
- Please inform students when teaching will be in English (MSc courses are required to be held in English)

Preparations for assistants

- Make sure that you know all necessary details about your experiment(s)
- Check with your colleague assistant and Mr. Stützler
- Detailed information for assistants is **available on paper** (ask Mr. Stützler) and in parts online for each experiment
- Ensure that you have access to your experiments
  - Get at least one key/experiment from Mr. Stützler.
- Make sure that you know, where consumables and all other equipment is located (check with Mr. Stützler);
  be aware that some consumables are expensive, e.g., wire for Rastertunnel tips
- Perform all relevant measurements and send a test protocol to fp@physik.uni-freiburg.de, in order to indicate that experiments are ready for teaching until 23rd of August 2019

Grading of Lab courses:

Finally, all notes and files need to be given to the organizers

- **Entrance exam** (contributes **20 %** to the grade of the individual experiment):
  - Prior to performing measurements, i.e., 9:00h or 13:00h of the first day of the individual course
  - Students should check with assistants where to meet for the exam (typically in the hall of the 1st floor of the GMH or at the experiment)
  - Written exam: Five questions in approx. 20 min.
  - Oral exam: Assistant needs to write a protocol about the discussion
  - Students get individual grades for this part and grades are given to students directly after the exams
  - In case of insufficient knowledge of the students, the course needs to be rescheduled (check with organizers!!!) and total exam needs to be repeated (the performance in the second trial can not be judged better than 2.0).
  - If students fail the second trial, or if students fail more than two (first) entrance exams, they will fail the entire advanced lab course class

- **Performing measurements (20%)** - 1.5 days for FP-I and 1 or 2 weeks for FP-II:
  - Measurements need to be performed by students and documented in a lab notebook (signed by assistant and attached to protocols)
  - Students can get individual grades

- **Written protocol (60%)**:
  - Together, students write a single protocol and get a common grade
  - Protocol criteria are listed on corresponding checklist (see ILIAS); assistants DISCUSS their review with students based on this checklist
  - When judged a grade of 6,0, students fail the entire advanced lab course class

- **Overall grade (20% entrance exam + 20% Performance + 60% Protocol)**
  - In general, the following grading system is to be applied for performance evaluation: 1,0 (sehr gut / best) – 1,3 – 1,7 – 2,0 – 2,3 – 2,7 – 3,0 – 3,3 – 3,7 – 4,0 (bestanden / passed) und / and 5,0 – 6,0 (nicht bestanden / failed)
  - more details on **ILIAS**

Honesty in science

needs to be ensured at all times

- Carefully acknowledge honesty in science (information sheet you received today)

- Follow these rules at all times

- Inform organizers about any suspicion about dishonest behavior

- In case of fraud, students will fail the entire lab course class

- For example:
  - Do not copy results from other groups
  - Cite all literature used for your protocol
  - Note: Old protocols are no valid reference!

Deadlines for protocols

- Give your protocol to the assistant (check best procedure with assistant)
- **In case of FP-I experiments:**
  - No later than one week after finishing measurements
  - Only the very first protocol of a group is reviewed as soon as possible and can be improved once by students before final grading
- **In case of FP-II experiments:**
  - No later than two weeks after finishing measurements of your last experiment
  - Check the schedule to ensure that corresponding protocols are graded and discussed with assistant prior to the seminar presentation
- Generally, students submit only one version of their protocol and this first version is graded as soon as possible by the assistants
- When protocols are submitted after the deadline please inform us
  - They may not be accepted any more!
- In case of illness or other strong reasons inform assistants and us prior to the deadline

Student Groups (also on Ilias)

Gruppe	Nachname	Vorname
101	Hoger	Tom Jonas
101	Rajaei	Marbini Arwin
102	Treumann	Lysander
102	Wenk	Johannes
103	Bode	Karl Erik
103	Lanzenstiel	Damian
104	Boemke	Wolfgang Willehad
104	Lang	Timo
105	Holschuh	Lennard Henrik
105	Machnitzky	Selina Marie
106	Goelz	Nicolai Adrian
106	Messerschnidt	Carl Leonard
107	Grether	Robin Louis
107	Schmoll	Marvin
108	Heinen	Lennart
108	Spreter	Felix
109	Mazibrada	David
109	Pikkemaat	Ole
110	Hofmann	Elias Ekehard Franz
110	Tekeste	Hany
111	Aktanka	Daniil
111	Oesterle	Markus
112	Schreck	Jan
112	Spanke	Tobias
113	Sell	Patrick
113	Riesterer	Felix
114	Joseph	Fabian Julian Emanuel
114	Sakhibov	Sino Hanns Ullrich

Gruppe	Nachname	Vorname
115	Kim	Ye Joon
115	Muennich	Partrik Moritz Samson
116	King	Montague
116	Lex	Fabian Simon
117	Maurer	Jan-Philipp
117	Rachel	Timo
118	Bronner	Philipp
118	Uttenweiler	Tim Christoph
119	Michael	Josua Gabriel Sigismund
119	Ruh	Lukas
120	Nauck	Tobias Martin
120	Tänzel	Victor
121	Neubrand	Niklas
121	Sonak	Frederic
122	Heinrich	Marlene
122	Stoll	Yann
123	Rock	Tilman
123	Weizel	Paul
124	Schmitt	Sarah
124	Spitzer	Alexandra Flora
125	Richter	Anna Katharina
125	Schaefer	Levin
126	Suchan	Gregor
126	Henes	Malte
127	Emig	Stephanie Anna
127	Hurrle	Lukas
201/301	Bellerino	Gabriele
201	Ludwig	Steffen

Current schedule

- Each B.Sc. group needs to perform 9 different FP-I experiments
  - Each experiment takes 1.5 days
  - Experiments start at
    - 9:00 h [marked with (V)]
    - or 13:00 h [marked with (N)]
- FP-EDU group (301) performs 3 FP-I experiments (1.5 days each) and a one-week FP-II experiment together with M.Sc. (201)

Termine für das Physiklabor für Fortgeschrittene Sommer/Herbst 2019

Kalenderwoche	Dates (each V / N)
36	02.09. 03.09. 04.09. 05.09. 06.09.
37	09.09. 10.09. 11.09. 12.09. 13.09.
38	16.09. 17.09. 18.09. 19.09. 20.09.
39	23.09. 24.09. 25.09. 26.09. 27.09.
40	30.09. 01.10. 02.10. 04.10.
41	07.10. 08.10. 09.10. 10.10. 11.10.
42	14.10. 15.10. 16.10. 17.10. 18.10.
	21.10.

Versuch / Termin (Nummer)	1		2		3		4		5		6		7		8		9		10		11		13
FP-I 1 Far.Pock.	102	101	125	126	121	122	127	301	119	120	113	114	109	110	103	104	105	106	123	124		118	
Moioli, Matteo (e)																							
Diehl, Leena																							
FP-I 2 KHWZ	103	110	111	112	123	120	102	101	117	114	115	116	119	106	105		107	108	125	126	109		
Wiik-Fuchs, Liv																							
Bozek, Krzysztof (e)																							
FP-I 3 Halbleiter	105	106	103	104	125	126	121	122	102	101				118.	115	108	113	114	111	112	127	124	117
Rodriguez Rodriguez, Arturo (e)																							
Hauser, Marc																							
FP-I 4 Kernspin	107	108	105	106	103	104	119	118	123	124	102	101	127	116	117	114	125	126	113	110	111		
Jiggins, Stephen (e)																							
Hohn, David																							
FP-I 5 Ultraschall	127	301	107	108	105	106	123	124	125	126	119	120	113	101	111	112	109	110	115	116		104	
Rendler, Nicolas																							
Gargiulo, Simona (e)																							
FP-I 6 Rastertunnel	111	112	110	301	107	108	125	126	103	104	121	122		122.	102	101	123	124	105	106	115	116	
Baier, Justin																							
Meinhardt, Patrick																							
FP-I 7 Hanle	113	114	121	122	109	110	103	104	118	112	123	124	117	108	119	120	127	101	107		125	126	
Guth, Manuel																							
Kuger, Fabian																							
FP-I 8 LHWZ	115	116	113	114	111	112	107	108	121	122	109	104		104.	123	124	117	118	102	101	119	120	
Wiehe, Moritz																							
Hirose, Shigeki (e)																							
FP-I 9 I2	117	118	115	116	113	114	109	110	105	106	127	112		112.	121	122	119	120	103	104	102	101	
Landmesser, Friedemann																							
Sarcevic, Nikolina (e)																							
FP-I 10 Szintillationszähler	119	120	117	118	115	116	111	112	107	108	125	126		126.	127	110	103	104	121	122	105	106	
Scholer, Patrick																							
Plesanovs, Vladislavs (e)																							
FP-I 11 SQUID	121	122	102	127	117	118	113	114	111	116	103	108	107	124	125	126	115			120	123		
Sperlich, Dennis																							
Guan, Jiwen (e)																							
FP-I 12 Ringlaser	123	124	119	120	102	127	115	116	109	110	105	106	111	114	113	118	121	122	117		107	112	
Thielemann, Fabian																							
Uhl, Daniel																							
FP-I A Projektpraktikum	109														109.				109				
Sperlich, Dennis																							
FP-II B Diamant																	201						
Palani, Deviprasath (e)																							

Stand: **25.7.2019** **Legende:** Abwesend | Eingeteilt | FP-LA oder FP-EDU | (e): Englischsprachige/r Assistant/in

Anmerkungen:

Generelle Zeit-Vetos: Maria-Laach | ATLAS-D München | GRK2044 Workshop

Seminar talk

- Presentation of the results of the two-week FP-II experiment,
  or the one-week FP-II experiment for FP-EDU, i.e., Master of Education,
  or (possibly) the project experiment.

- Talk: approx. 40 minutes (reasonably subdivided between students)
  - Powerpoint (ppt), OpenOffice(odp), or PDF (preferred)
  - Other students need to be able to comprehend your talk
  - Discuss and improve the content of your slides with the help of the assistant

- Discussion: 10-15 minutes

- Criteria: Quality of slides, level of oral presentation, and demonstrated background knowledge
  (see checklist on ILIAS)

Schedule for seminars

- Each group needs to give one talk

- All groups are required to participate in at least ¾ of all talks of their block (this time: only 1-2 talks, so expect both groups to attend both talks)
  - FP-I students are not required to attend the seminar talks, but highly encouraged (good chance to experience how you will have to do this in the FP-II later on)

- M.Sc. students present in English
  (B.Sc., Lehramt and M.Edu. can be in German)

- Date and time: TBA

- Room: TBA

Summary of class program

- Overall grade is the average from all partial grades. The average needs to be 4.0 or better, in order to pass the lab course

- Teaching students (Lehramt, GymPO):
  - 1x statistics exam
  - 5x FP-I experiments
  - 1x FP-II experiment (two weeks)
  - 1x seminar talk

- Teaching students (Master of Education):
  - 3x FP-I experiments
  - 1x FP-II experiment (one week)
  - 1x seminar talk

- B.Sc. and M.Sc. students (FP-I):
  - 9x FP-I experiment (1.5 days)

- B.Sc. and M.Sc. students (FP-II):
  - 2x FP-II experiment (one week)
  - 1x FP-II experiment (two weeks)
  - 1x seminar talk

We wish you the best of success.

Mandatory exam for FP-LA

- All teaching students (only FP-LA) are required to participate in statistics exam (B.Sc., M.Sc., and M.Edu. students are not)
  - As we have no FP-LA students, not exam scheduled
  - Students, who are not enrolled in the FP, but would like to participate for next semester: Please send an e-mail to fp@physik.uni-freiburg.de, if not done, yet
  - Content is embedded into the lecture program of *Experimentelle Methoden der Physik* and details can be found on our web page.
  - Grade of the exam will contribute to final FP grade *(siehe* Leistungserfassung.pdf *auf ILIAS)*