

# **Advanced Laboratory Courses**

FP-2 (Master) / FP-EDU (Education)

## **Feedback Sheets**

University of Freiburg

Institute of Physics

*Version 0.1 (Draft)*

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5. FP-EDU Seminar Feedback and Grade

# 1. Learning Phase Feedback

This feedback is formative and does not affect the grade. It supports learning during the laboratory phase.

**Student:**

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**Experiment:**

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**Date:**

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**Tutor:**

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## Entrance Conversation

<input type="checkbox"/> Passed	<input type="checkbox"/> Repeated	<input type="checkbox"/> Failed
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## Preparation

Criterion	Excellent	Good	Basic	Insufficient
Understanding of physics principles	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Awareness of measurement technique	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Anticipation of expected results	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Awareness of uncertainty sources	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

## Laboratory Work

Criterion	Excellent	Good	Basic	Insufficient
Execution of measurements	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Notebook documentation	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Data management	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Safety awareness	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

## Presentations (Day 1 + Last Day)

Criterion	Excellent	Good	Basic	Insufficient
Clarity of presentation	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

Engagement in discussion	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Response to questions	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Honesty about uncertainties	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

**Written feedback on learning phase:**

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*Tutor signature / Date*

*Student signature / Date*

Note: This is formative feedback. A copy is retained by the tutor and the student.

## 2. Short Report Feedback and Grade

For FP-EDU experiments 1 and 2. Same principles as full reports, reduced scope. Quality over length.

**Student:** \_\_\_\_\_

**Experiment:** \_\_\_\_\_

**Submission date:** \_\_\_\_\_

**Tutor:** \_\_\_\_\_

### Report Assessment

Criterion	Excellent	Good	Basic	Insufficient
Clear statement of objectives	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Appropriate method description	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Data presentation with uncertainties	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Quality of analysis	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Interpretation and discussion	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Honest treatment of limitations	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Use of references	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

**Written feedback on report:**

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**Resubmission (if applicable)** Resubmission required

Deadline: \_\_\_\_\_

**Grade:****Grade justification (required):**

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*Tutor signature / Date**Student signature / Date*

### 3. Full Scientific Report Feedback and Grade

For FP-2 one-week experiments and FP-EDU experiment 3. Comprehensive scientific documentation required.

**Student:** \_\_\_\_\_

**Experiment:** \_\_\_\_\_

**Course:** \_\_\_\_\_

FP-2 (Master)  FP-EDU (Education)

**Submission date:** \_\_\_\_\_

**Tutor:** \_\_\_\_\_

#### Introduction

Criterion	Excellent	Good	Basic	Insufficient
Context and motivation	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Clear statement of objectives	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Connection to physics principles	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

#### Method

Criterion	Excellent	Good	Basic	Insufficient
Description of experimental setup	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Explanation of procedure	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Sufficient detail for replication	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

#### Results

Criterion	Excellent	Good	Basic	Insufficient
Clear data presentation	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Appropriate visualisation	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Uncertainties stated and justified	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Anomalies acknowledged	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

## Discussion

Criterion	Excellent	Good	Basic	Insufficient
Interpretation connected to physics	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Transparent assumptions	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Limitations acknowledged	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Alternative explanations considered	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

## Conclusion and References

Criterion	Excellent	Good	Basic	Insufficient
Key findings summarised	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Open questions identified	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Sources properly acknowledged	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

## Overall Quality

Criterion	Excellent	Good	Basic	Insufficient
Logical flow and structure	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Scientific writing quality	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Integration of theory and experiment	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

## Written feedback on report:

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**Resubmission (if applicable)**

<input type="checkbox"/> Resubmission required	Deadline: _____
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**Grade:****Grade justification (required):**

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*Student signature / Date*

## 4. Master-Seminar Feedback and Grade

For FP-2 seminar presentation (two-week experiment results). 60 minutes: ~30 min presentation + ~15 min discussion + ~15 min exam questions.

**Student:** \_\_\_\_\_

**Experiment:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Tutor:** \_\_\_\_\_

**Organiser:** \_\_\_\_\_

### Presentation (~30 min)

Criterion	Excellent	Good	Basic	Insufficient
Clear logical structure	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Coherent argumentation	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Causal connections established	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Understanding of physics (not just procedure)	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Honest treatment of uncertainties	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Connection between theory and experiment	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Visual quality and clarity	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Invites discussion	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

### Discussion Phase (~15 min)

Criterion	Excellent	Good	Basic	Insufficient
Engagement with questions	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Quality of responses	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Openness to alternative views	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Honesty about limitations	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

**Exam Questions (~15 min)**

Criterion	Excellent	Good	Basic	Insufficient
Depth of understanding	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Ability to extend beyond presentation	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Response to probing questions	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Scientific reasoning	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

**Written feedback on seminar:**

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**Grade:****Grade justification (required):**

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*Tutor signature / Date*

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*Student signature / Date*

## 5. FP-EDU Seminar Feedback and Grade

Exam phase of Labor-Spezial. 60 minutes: ~30 min presentation + ~15 min discussion + ~15 min exam questions. Didactic reflection must be integrated throughout.

**Student:** \_\_\_\_\_

**Labor-Spezial topic:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Tutor:** \_\_\_\_\_

**Organiser:** \_\_\_\_\_

### Physics Content

Criterion	Excellent	Good	Basic	Insufficient
Understanding of physics principles	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Quality of experimental work	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Data analysis and interpretation	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Honest treatment of uncertainties	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

### Didactic Reflection (must be integrated throughout)

Criterion	Excellent	Good	Basic	Insufficient
Integration of didactic content	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Identification of key conceptual challenges	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Realistic adaptation proposals	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Connection to curriculum/pedagogy	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Awareness of learner perspective	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

### Presentation Quality (~30 min)

Criterion	Excellent	Good	Basic	Insufficient
Clear logical structure	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

Coherent argumentation	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Visual quality and clarity	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Invites discussion	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

## **Discussion Phase (~15 min)**

Criterion	Excellent	Good	Basic	Insufficient
Engagement with questions	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Quality of responses	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Openness to alternative views	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

## **Exam Questions (~15 min)**

<b>Criterion</b>	<b>Excellent</b>	<b>Good</b>	<b>Basic</b>	<b>Insufficient</b>
Depth of physics understanding	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Depth of didactic reasoning	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient
Ability to extend beyond presentation	<input type="checkbox"/> Excellent	<input type="checkbox"/> Good	<input type="checkbox"/> Basic	<input type="checkbox"/> Insufficient

## **Written feedback on seminar:**

**Didactic Reflection Assessment**

<input type="checkbox"/> Fully integrated	<input type="checkbox"/> Present but superficial
<input type="checkbox"/> Added as afterthought	<input type="checkbox"/> Missing or inadequate

**Grade:****Grade justification (required):**

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*Tutor signature / Date*

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*Student signature / Date*

Note: This grade covers the Labor-Spezial (learning phase + seminar). Didactic reflection is required in both phases.