GENERAL INFORMATION OF
TEACHING INSTRUCTIONAL DESIGN (BRP)
AND
STUDENT WORK HANDBOOK (BPKM)
UNIVERSITAS INDONESIA

The Teaching Instructional Design (BRP) and Student Work Handbook (BPKM) are the Semester Lesson Plan (RPS) in Universitas Indonesia. Regulation of the Minister of Research, Technology and Higher Education of the Republic of Indonesia Number 44 of 2015 concerning National Higher Education Standards in Article 12 mandates that any learning held in tertiary institutions must be planned and documented in the Semester Learning Plan (RPS) or in other terms.

The Teaching Instructional Design is for the lecturer, while the Student Work Handbook is for the students.

Referring to the ministerial regulation, The Teaching Instructional Design (BRP) and Student Work Handbook (BPKM) contain:

(a) the name of the study program, the name and code of the course, semester, credits, name of the supporting lecturer;
(b) graduate learning outcomes imposed on courses;
(c) sub-competencies or final abilities that are planned at each stage of learning to meet the learning outcomes of graduates;
(d) the stages of learning along with the time and percentage provided to achieve the ability at each stage of learning;
(e) study materials related to the capabilities to be achieved along with a list of references used;
(f) learning methods;
(g) student learning experience embodied in the description of tasks that must be done by students for one semester; and
(h) evaluation of learning results that contains criteria, indicators, and weight of the assessment.

The contents in Teaching Instructional Design (BRP) and Student Work Handbook (BPKM) are the same, except that BRP is completed in the Appendix with examples of assignments and evaluations (daily, Midterm Exam, and Final Exam) given by the teacher to students.

The following is the format for Teaching Instructional Design (BRP) and Student Work Handbook (BPKM). The sections in italics are explanations for the preparation so that they do not need to be written in Teaching Instructional Design (BRP) and Student Work Handbook (BPKM).

TEACHING INSTRUCTIONAL DESIGN (BRP)

COURSE

Advanced Laboratory

by

Efta Yudiarsah, Ph.D

Undergraduate Program in Physics
Faculty of Mathematics and Natural Sciences
Universitas Indonesia

Depok, November 2016

TABLE OF CONTENTS

VALIDITY SHEET

TEACHING DESIGN BOOK

COURSE

Advanced Laboratory

by

Efta Yudiarsah, Ph.D.

Depok, December 2th 2016

Acknowledged:

Head of Department of Physics

Dr. rer. nat Agus Salam

PREFACE

In this course, students learn various topics of research preparation in the field of physics, these topics include introduction to philosophy and research methodology, writing research proposals, and presenting research proposals. To train students' abilities to become lifelong learners, students will study these topics and methods with a student-centered learning approach. However, there is a small part about certain concepts and techniques that must be conveyed by lecturers using lecturer-centered methods. Students will be accustomed to studying the latest research results from the first source in the form of publication of research results in journals in the literature study section.

In addition, students are given a research proposal writing project as an exercise in making a thesis research proposal. This research proposal is written by developing the results of reading in the literature study. In addition, students are also trained to write presentation sheets and present research proposals that they have made.

This Learning Design Book was prepared as a complement to teaching in the Physics Undergraduate Program, Department of Physics, Faculty of Mathematics and Natural Sciences at the University of Indonesia. This book is a guide for activities during the learning process. Thus the learning process carried out by students can be directed and in the end the learning objectives can be achieved.

We would like to thank the leadership of the Department of Physics and staff, so that this book can be completed.

Depok, November 26th 2016

Efta Yudiarsah, Ph.D.

CHAPTER 1
GENERAL INFORMATION

1. Name of Program / Study Level : Physics / Undergraduate .....
2. Course Name : Advanced Laboratory
3. Course Code : SCFI603621.....
4. Term : 6.....
5. Credit : 3 Credits.....
6. Teaching Method(s) : *Project Based Learning*.....
7. Prerequisite course(s) : Introduction to Solid-State Physics and Quantum Mechanics 1
8. Requisite for course(s) : -
9. Integration Between Other Courses : Undergraduate Thesis
10. Course Description :

Seminar courses cover four major topics, namely an introduction to the philosophy of science and research methodology, literature studies, writing research proposals, and presentation of research proposals. Students take this course with active learning methods, namely interactive lectures, group discussions, and project based learning. Students have the opportunity to practice integrating understanding of physics concepts, analytical, numerical knowledge, and / or experimentation in practicing the four topics above. Students also practice explaining and analyzing natural phenomena and human engineering results in physics and applications by using related physics concepts. In addition, students can develop the ability to synthesize and evaluate both qualitatively and quantitatively phenomena in the field of physics by using related physics concepts. After taking this course, first-year students are expected to be able to apply theoretical/computing and/or experimental skills in small research projects in the field of condensed matter. [Dept. Competency Based Curriculum. Physics FMIPA UI 2011].

Theoretical / computational topics: calculation of energy band structures using various

methods (tight-binding, linear combination of atomic orbitals, density functional theory, etc.), calculation of various physical properties of solids (state density, optical conductivity, etc.) using Green function techniques.

Experimental topics: measurement and analysis of optical spectroscopy, ferromagnetic hysteresis, ferroelectric hysteresis, etc.

CHAPTER 2
COMPETENCIES AND SUB-COMPETENCIES

2.1 Competencies (Learning Outcomes)

After completing this course, when faced with problems in the field of physics, second-year third semester students are able to compose a research proposal according to scientific principles and good and correct Bahasa Indonesia. Apply theoretical / computational and / or experimental skills in small research projects in the field of condensed matter physics.

2.2 Sub Competencies (Abilities at the End of the Learning Stage)

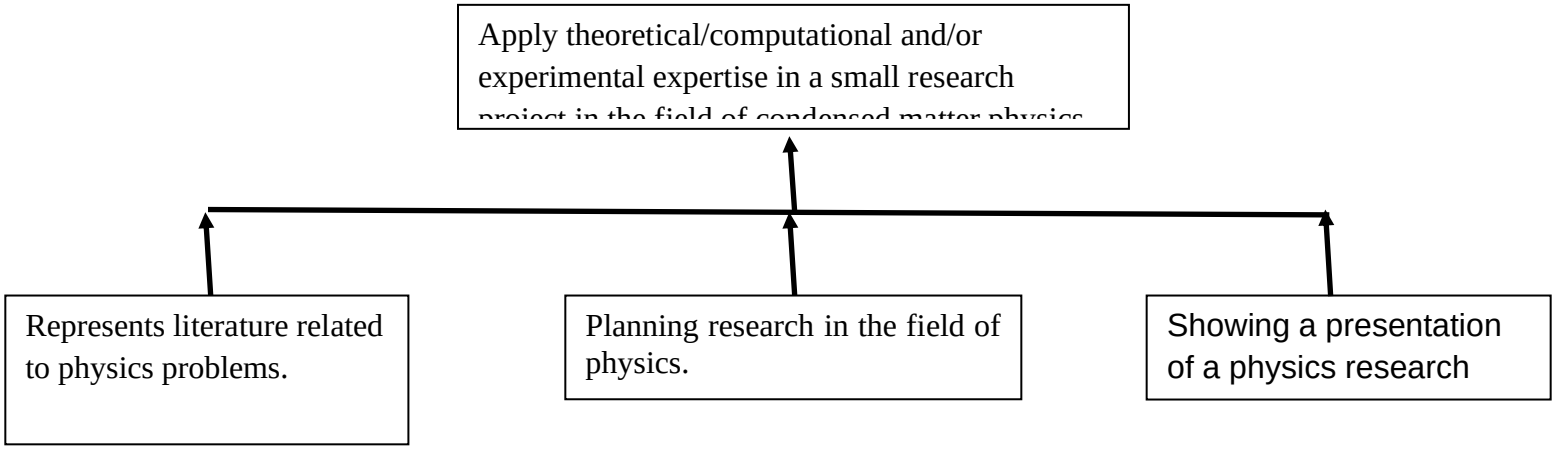
After completing this module, when faced with problems in the field of physics, students are competent in:

2.2.1. Represents literature related to physics problems. (C5)

2.2.2. Planning research in the field of physics. (C5)

2.2.3. Presenting the physics research proposal presentation. (C5)

2.3 Competency Flowchart



CHAPTER 3
DISCUSSION AND REFERENCES

3.1 Sub-Competencies, Main Topics, Subtopics, Time Estimation, and References

Sub-Competencies	Main Topics	Subtopics	Time Estimation	References
2.2.1.	Topics Theoretical/computational: calculation of energy band structures using various methods (tight-binding, linear combination of atomic orbitals, density functional theory, etc.), calculation of various physical properties of solids (state density, optical conductivity, etc.) using Green function techniques. 2.2.1.1. Topics experimental: measurement and analysis of optical spectroscopy, ferromagnetic hysteresis, ferroelectric hysteresis, etc.	1.1. Introduction to Philosophy and Research Methodology 1.2. Scientific Study of Literature	300 minutes	[1]
2.2.2.	2.2.2.1 Writing Research Proposal	2.1. Proposal Writing	500 minutes	[2]
2.2.3	2.2.3.1 Presentation of Research Proposal	3.1. Proposal Presentation	800 minutes	[3]

3.2 References

[1] Physics journals/books that support and as needed.

[2] …

CHAPTER 4
LEARNING STAGE

Sub-Competencies	Learning Stage			Technology and Media
	O (%)	E (%)	F (%)	
2.2.1	Interactive Lecture 1.1 to 1.2 (20%)	Project Based Learning 1.1. and 1.2 (70%)	Class Discussion (10%)	Whiteboard, LCD, Laptop
2.2.2	Interactive Lecture 2.1 (15%)	Project Based Learning 2.1 (75%)	Class Discussion (10%)	Whiteboard, LCD, Laptop
2.2.3	Interactive Lecture 3.1 (10%)	Project Based Learning 3.1 (80%)	Class Discussion (10%)	Whiteboard, LCD, Laptop

Note:

In terms of the learning method for this subject, two active learning methods are applied as follows. **(1) interactive lectures** are conducted for orientation in the form of discussions and explanations by both lecturers and students. **(2) Project Based Learning** is carried out individually to write a research proposal and prepare a research proposal presentation.

Orientation (O); Exercise (E); Feedback (F)

CHAPTER 5
DESIGN OF ASSIGNMENT AND EXERCISE

5.1 Task Objectives (Expected Final Skills)

After completing this course, when faced with physics problems in the field of condensed matter physics, first-year students in the second semester are able to compile conceptual explanations of certain phenomena in the field of condensed matter physics, such as strongly correlated electron systems, nanoscience, mesoscopic physics based on theoretical methods. both numerical and analytical such as Green function, linear response theory, static mean-field approximation, dynamical mean-field approximation, etc.

Tabel Uraian Tugas

Sub-Competence	Assignment *	Scope	Working Procedure	Deadline	Outcome
2.2.1	**Paper Summary**	1. Introduction to research philosophy and methodology 2. Scientific Study of literature	Individual	three weeks	Written report

2.2.2	**Proposal**	1. Writing a research proposal	Individual	eight weeks	Written report
2.2.3	**Presentation Sheet**	1. Research proposal presentation	Individual	two weeks	Written report

Assignment Sample are attached

5.2 **Assessment Criteria**

Grading Assignment Paper Summary/Proposal/Presentation Sheet: language (20%), completeness (40%), and content (40%).

CHAPTER 6

LESSON EVALUATION RESULTS

6.1 Final Evaluation

Type	Instrument	Frequency	Weight (%)
Summary Paper	Summary Paper File	1	20
Proposal	Assignment File	1	45
Presentation	Grading Sheet	1	15
Participation	Grading Sheet	1	5
Presentation Sheet	Examination Questions	1	15
Total			**100**

Note: Sample of Evaluation questions are attached.

6.2 Assessment

Sub-competencies	Domain and Level	Type of Assessment (Per Each Competencies)	Passing Grade
2.2.1	C5	Assignment	55
2.2.2	C5	Assignment	55
2.2.3	C5	Assignment	55

6.3 Guidelines for Assessment Criteria

The conversion of the final value (student passing grade) follows the value conversion provisions applicable at the University of Indonesia as follows.

Score	Grade	Quality
85—100	A	4.00
80—<85	A-	3.70
75—<80	B+	3.30
70—<75	B	3.00
65—<70	B-	2.70
60—<65	C+	2.30
55—<60	C	2.00
40—<55	D	1.00
<40	E	0.00

The criteria for evaluating the forms of evaluation that are held in this course are as follows.

a. Presentation:

Score 90-100: Students can present material in correct Indonesian, understandable explanations, master the material, and good body language.

Score 70-89: Students can present material with explanations that can be understood, master the material well, good body language.

Score 60-69: Students can present material with explanations that can be understood with good body language.

b. Summary Paper / Proposal /Presentation Sheet:

Score 90-100 : Students can apply the concepts in explaining related phenomena with 80-90% accuracy, coherence and correct language.

Score 70-89 : Students can apply the concepts in explaining related phenomena with 60-79% accuracy and in good language.

Score 60-69 : Students can apply the concepts in explaining natural phenomena and technology with 59% accuracy with good language.

CHAPTER 7

UNIT TEACHING EVENTS

Pertemuan ke-	Sub-Competence	Activity (Description of the Learning Stage which shows SCAL consists of 3 components: O, E, and F)	Main Topics/Subtopics	Media	Reference(s)
1	2.2.1	class discussion on presentation concepts (O); making a presentation sheet (E); discussion in class (F)	1. Introduction to Philosophy and Research Methodology	Whiteboard, LCD, Laptop, and Internet	[1]
2	2.2.1	class discussion on presentation concepts (O);	2. Scientific Study of Literature	Whiteboard, LCD, Laptop, and Internet	[1]

		making a presentation sheet (E); discussion in class (F)			
3	2.2.1	class discussion on presentation concepts (O); making a presentation sheet (E); discussion in class (F)	2. Scientific Study of Literature	Whiteboard, LCD, Laptop, and Internet	[1]
4	2.2.2	class discussion on presentation concepts (O); making a presentation sheet (E); discussion in class (F)	3. Research Proposal Writing	Whiteboard, LCD, Laptop, and Internet	[1]
5	2.2.2	class discussion on presentation concepts (O);	3. Research Proposal Writing	Whiteboard, LCD, Laptop, and Internet	[1]

		making a presentation sheet (E); discussion in class (F)			
6	2.2.2	class discussion on presentation concepts (O); making a presentation sheet (E); discussion in class (F)	3. Research Proposal Writing	Whiteboard, LCD, Laptop, and Internet	[1]
7	2.2.2	class discussion on presentation concepts (O); making a presentation sheet (E); discussion in class (F)	3. Research Proposal Writing	Whiteboard, LCD, Laptop, and Internet	[1]
8	2.2.2	class discussion on presentation concepts (O);	3. Research Proposal Writing	Whiteboard, LCD, Laptop, and Internet	[1]

		making a presentation sheet (E); discussion in class (F)			
9	2.2.3	class discussion on presentation concepts (O); making a presentation sheet (E); discussion in class (F)	4. Research Proposal Presentation	Whiteboard, LCD, Laptop, and Internet	[1]
10	2.2.3	class discussion on presentation concepts (O); making a presentation sheet (E); discussion in class (F)	4. Research Proposal Presentation	Whiteboard, LCD, Laptop, and Internet	[1]
11	2.2.3	class discussion on presentation concepts (O);	4. Research Proposal Presentation	Grading Sheet	[1]

		making a presentation sheet (E); discussion in class (F)			
12	2.2.3	class discussion on presentation concepts (O); making a presentation sheet (E); discussion in class (F)	4. Research Proposal Presentation	Grading Sheet	[1]
13	2.2.3	class discussion on presentation concepts (O); making a presentation sheet (E); discussion in class (F)	4. Research Proposal Presentation	Grading Sheet	[1]
14	2.2.3	class discussion on presentation concepts (O);	4. Research Proposal Presentation	Grading Sheet	[1]

		making a presentation sheet (E); discussion in class (F)			
15	2.2.3	class discussion on presentation concepts (O); making a presentation sheet (E); discussion in class (F)	4. Research Proposal Presentation	Grading Sheet	[1]
16	2.2.3	class discussion on presentation concepts (O); making a presentation sheet (E); discussion in class (F)	4. Research Proposal Presentation	Grading Sheet	[1]

Description of the Design Number of meetings:

Description of Design Number of meetings: Number of meetings: 16 times 2 hours. Total 32 hours meeting, including UTS and UAS.

ATTACHMENT

SAMPLE OF ASSIGNMENT AND QUESTIONS EVALUATION (FINAL EXAM, MIDTERM EXAM, ETC.)

Attachment 1. Assignment Sample

1. Contoh Tugas Makalah: format penulisan, isi, dan logika

Tugas Makalah. Bacalah beberapa literature terkait topik rencana penelitian Anda, minimal lima paper. Tulislah sebuah makalah mengenai topik tersebut dalam bentuk *review*.

2. Contoh Tugas Proposal:

Tugas Proposal. Tulislah proposal riset berdasarkan topik rencana penelitian Anda

3. Contoh tugas Lembar Presentasi: format penulisan, isi, dan logika

Buatlah lembar presentasi proposal riset Anda dalam bentuk file ppt.