	Universitas Negeri Surabaya Faculty of Mathematics and Natural Sciences Physics Education Masters Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Physics Education Philosophy and Curriculum	8410302003		T=2	P=0	ECTS=4.48	1	January 9, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
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Learning model	**Project Based Learning**	
Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**	
	PLO-3	Develop logical, critical, systematic and creative thinking in carrying out specific work in their field of expertise and in accordance with work competency standards in the field concerned
	PLO-8	Solving physics education problems through a multi- and interdisciplinary approach, as well as documenting and communicating them.
	PLO-11	Carrying out and managing research and development to solve physics education problems using quantitative, qualitative and mixed method approaches in an interdisciplinary or multidisciplinary manner.
	PLO-15	Mastering philosophy, learning concepts and theories, media and physics education assessments and their implications for learning
	Program Objectives (PO)	
	PO - 1	Able to utilize science and technology to find sources of information related to PHYSICS products (ontology), philosophers' thought processes, and philosophical values in the development of physics products to develop knowledge and increase devotion to God Almighty, scientific attitudes, and academic and social ethics in social life and patriotic
	PO - 2	Able to master the products of physics, the main ideas of philosophers, deductive-logic, inductive, falsification, scientific methods and their justifications logically, systematically and critically in the development of physics to solve physics education problems
	PO - 3	Applying the physics philosophy he masters to identify and solve physics education problems, policies related to physics education through an inter and multidisciplinary approach
	PO - 4	Able to manage research to solve physics education and learning problems through studying the philosophy of physics on various physics learning policies and practices that are beneficial to society and published in international journals
	PLO-PO Matrix	

P.O	PLO-3	PLO-8	PLO-11	PLO-15
PO-1		✔		
PO-2	✔			
PO-3				✔
PO-4			✔	

PO Matrix at the end of each learning stage (Sub-PO)

P.O	Week															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PO-1	✔	✔	✔													
PO-2				✔	✔	✔	✔	✔								
PO-3									✔	✔						
PO-4											✔	✔	✔	✔	✔	✔

Short Course Description	Examining the philosophy of physics through critical analysis of PHYSICS products and the thought processes of PHYSICS philosophers/scientists including their justification from various learning sources/media and their application in the context of PHYSICS education logically, critically and innovatively to analyze problems/issues/policies in PHYSICS education and learning so that they can be solved through useful and published research
References	**Main :**

1. Thomas J. Hickey, 2011, Introduction to phisophy of science. NewYork: Springer
2. Craigh Dilworth, 2006, The methaphysics of science: Boston studies in the philosophy of science, Netherland: Springer.
3. Cornel M. Hamm, 2005, Philosophycal Issues in Education: An introduction, London: Routledge
4. James Ladyman, 2002, Understanding philosophy of science, London and New York: Roudledge

Supporters:

1. Anna Poedjiadi, 2001, Filsafat Ilmu Kependidikan, Bandung
2. Wilburg Applebaum, 2005, The scientific revolution and the foundation of modern science, London: Greenwood Press

Supporting lecturer	Prof. Nadi Suprapto, S.Pd., M.Pd., Ph.D. Dr. Oka Saputra, M.Pd

Week-	**Final abilities of each learning stage (Sub-PO)**	**Evaluation**		**Help Learning, Learning methods, Student Assignments, [Estimated time]**		**Learning materials [References]**	**Assessment Weight (%)**
		Indicator	**Criteria & Form**	**Offline (*offline*)**	**Online (*online*)**		
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
1	1. Able to utilize science and technology to find sources of information related to PHYSICS products (ontology) 2. Able to use science and technology to find sources of information related to philosophers' thought processes. 3. Able to utilize science and technology to find sources of information related to philosophical values in the development of physics products to develop knowledge and increase devotion to God Almighty, scientific attitudes, and academic and social ethics in social and state life	1. Exploring PHYSICS products (concepts, principles and theories) from various sources of information 2. Analyze the thought process and scientific attitude in developing PHYSICS 3. Distinguish between the domains of metaphysics, philosophy and scientific method 4. Distinguish between physics, pseudophysics and religion	**Criteria:** Attitude observation **Form of Assessment** : Participatory Activities	Lecture, discussion, question and answer and cased method 2x50 minutes			2%

2	1. Able to utilize science and technology to find sources of information related to PHYSICS products (ontology) 2. Able to use science and technology to find sources of information related to philosophers' thought processes. 3. Able to utilize science and technology to find sources of information related to philosophical values in the development of physics products to develop knowledge and increase devotion to God Almighty, scientific attitudes, and academic and social ethics in social and state life	1. Exploring PHYSICS products (concepts, principles and theories) from various sources of information 2. Analyze the thought process and scientific attitude in developing PHYSICS 3. Distinguish between the domains of metaphysics, philosophy and scientific method 4. Distinguish between physics, pseudophysics and religion	**Criteria:** Attitude observation **Form of Assessment** : Participatory Activities	Lecture, discussion, question and answer and cased method 2x50 minutes			2%
3	1. Able to utilize science and technology to find sources of information related to PHYSICS products (ontology) 2. Able to use science and technology to find sources of information related to philosophers' thought processes. 3. Able to utilize science and technology to find sources of information related to philosophical values in the development of physics products to develop knowledge and increase devotion to God Almighty, scientific attitudes, and academic and social ethics in social and state life	1. Exploring PHYSICS products (concepts, principles and theories) from various sources of information 2. Analyze the thought process and scientific attitude in developing PHYSICS 3. Distinguish between the domains of metaphysics, philosophy and scientific method 4. Distinguish between physics, pseudophysics and religion	**Criteria:** Attitude observation **Form of Assessment** : Participatory Activities	Lecture, discussion, question and answer and cased method 2x50 minutes			2%

4	1. Able to master physics products 2. Able to master the main ideas of philosophers, deductive-logic, inductive, falsification, scientific methods and their justifications logically, systematically and critically in the development of physics to solve physics education problems	1. Explain at least 3 PHYSICS products and the discovery process 2. Explain the thought process (scientific method) used in discovering PHYSICS products 3. Explain the justification for the product found	**Form of Assessment** : Participatory Activities	Lecture, Question and answer, Discussion and Case Method 2x50 minutes			2%
5	1. Able to master physics products 2. Able to master the main ideas of philosophers, deductive-logic, inductive, falsification, scientific methods and their justifications logically, systematically and critically in the development of physics to solve physics education problems	1. Explain at least 3 PHYSICS products and the discovery process 2. Explain the thought process (scientific method) used in discovering PHYSICS products 3. Explain the justification for the product found	**Form of Assessment** : Participatory Activities	Lecture, Question and answer, Discussion and Case Method 2x50 minutes			2%
6	1. Able to master physics products 2. Able to master the main ideas of philosophers, deductive-logic, inductive, falsification, scientific methods and their justifications logically, systematically and critically in the development of physics to solve physics education problems	1. Explain at least 3 PHYSICS products and the discovery process 2. Explain the thought process (scientific method) used in discovering PHYSICS products 3. Explain the justification for the product found	**Form of Assessment** : Participatory Activities	Lecture, Question and answer, Discussion and Case Method 2x50 minutes			2%

7	1. Able to master physics products 2. Able to master the main ideas of philosophers, deductive-logic, inductive, falsification, scientific methods and their justifications logically, systematically and critically in the development of physics to solve physics education problems	1. Explain at least 3 PHYSICS products and the discovery process 2. Explain the thought process (scientific method) used in discovering PHYSICS products 3. Explain the justification for the product found	**Form of Assessment** : Participatory Activities	Lecture, Question and answer, Discussion and Case Method 2x50 minutes			2%
8	1. Able to master physics products 2. Able to master the main ideas of philosophers, deductive-logic, inductive, falsification, scientific methods and their justifications logically, systematically and critically in the development of physics to solve physics education problems	1. Explain at least 3 PHYSICS products and the discovery process 2. Explain the thought process (scientific method) used in discovering PHYSICS products 3. Explain the justification for the product found	**Form of Assessment** : Participatory Activities	Lecture, Question and answer, Discussion and Case Method 2x50 minutes			2%
9	1. Applying the philosophy of physics he mastered to identify 2. Solving physics education problems 3. Able to understand policies related to physics education through an inter and multidisciplinary approach	1. Identifying problems in physics education, policy and learning 2. Explain logically the framework for thinking about the problems identified	**Form of Assessment** : Participatory Activities	Lecture, Question and Answer, Discussion and Project Based Learning 2x50 minutes			2%
10	1. Applying the philosophy of physics he mastered to identify 2. Solving physics education problems 3. Able to understand policies related to physics education through an inter and multidisciplinary approach	1. Identifying problems in physics education, policy and learning 2. Explain logically the framework for thinking about the problems identified	**Form of Assessment** : Participatory Activities	Lecture, Question and Answer, Discussion and Project Based Learning 2x50 minutes			2%

11	1. Able to manage research to solve physics education and learning problems through studying the philosophy of physics in various policies 2. Able to carry out physics learning practices that are beneficial to society and published in journals	1. Prepare proposals 2. Do research	**Form of Assessment** : Participatory Activities	Lecture, Question and Answer, Discussion, Project Based Learning 2x50 Minutes			2%
12	1. Able to manage research to solve physics education and learning problems through studying the philosophy of physics in various policies 2. Able to carry out physics learning practices that are beneficial to society and published in journals	1. Prepare proposals 2. Do research	**Form of Assessment** : Participatory Activities	Lecture, Question and Answer, Discussion, Project Based Learning 2x50 Minutes			2%
13	1. Able to manage research to solve physics education and learning problems through studying the philosophy of physics in various policies 2. Able to carry out physics learning practices that are beneficial to society and published in journals	1. Prepare proposals 2. Do research	**Form of Assessment** : Participatory Activities	Lecture, Question and Answer, Discussion, Project Based Learning 2x50 Minutes			2%
14	1. Able to manage research to solve physics education and learning problems through studying the philosophy of physics in various policies 2. Able to carry out physics learning practices that are beneficial to society and published in journals	1. Prepare proposals 2. Do research	**Form of Assessment** : Participatory Activities	Lecture, Question and Answer, Discussion, Project Based Learning 2x50 Minutes			2%

15	1. Able to manage research to solve physics education and learning problems through studying the philosophy of physics in various policies 2. Able to carry out physics learning practices that are beneficial to society and published in journals	1. Prepare proposals 2. Do research	**Criteria:** Qualitative **Form of Assessment** : Participatory Activities	Lecture, Question and Answer, Discussion, Project Based Learning 2x50 Minutes			2%
16	1. Able to manage research to solve physics education and learning problems through studying the philosophy of physics in various policies 2. Able to carry out physics learning practices that are beneficial to society and published in journals	1. Prepare proposals 2. Do research	**Criteria:** Qualitative **Form of Assessment** : Project Results Assessment / Product Assessment	Lecture, Question and Answer, Discussion, Project Based Learning 2x50 Minutes			70%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	30%
2.	Project Results Assessment / Product Assessment	70%
		100%

Notes

1. **Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
2. **The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
3. **Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
4. **Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
5. **Indicators for assessing** ability in the process and student learning outcomes are specific and measurable statements that identify the ability or performance of student learning outcomes accompanied by evidence.
6. **Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
7. **Forms of assessment:** test and non-test.
8. **Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
9. **Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
10. **Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
11. **The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.