	Universitas Negeri Surabaya **Faculty of Mathematics and Natural Sciences** **Science Education Doctoral Study Program**	**Document Code**

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Problems and Innovation in Science Education	8400102054	Compulsory Study Program Subjects	**T=2**	**P=0**	**ECTS=5.04**	1	June 20, 2022

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	Prof. Dr. Budi Jatmiko, M.Pd.	Prof. Dr. Budi Jatmiko, M.Pd.	Prof. Dr. Suyatno, M.Si.

Learning model	**Case Studies**	
Program Learning Outcomes (PLO)	**PLO study program which is charged to the course**	
	PLO-8	2. Able to prepare scientific arguments and solutions based on a critical view of facts, concepts, principles or theories that can be justified scientifically and academically, and communicate them through scientific publications in reputable international journals
	PLO-12	2. Master the latest theories related to scientific knowledge and science education
	Program Objectives (PO)	
	PO - 1	Utilizing learning resources and ICT to support student achievement of competencies related to Innovation and Problems in Science Education
	PO - 2	Have knowledge and insight into Science Education Problems.
	PO - 3	Have the skills to conduct library reviews, analyze situations, and synthesize and develop innovations in order to solve science education problems
	PO - 4	Have a responsible, objective attitude in implementing innovation to solve science education problems
	PLO-PO Matrix	

P.O	PLO-8	PLO-12
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	Studying the problems faced by science education at local, regional and global levels, carrying out analysis (Fishbone Analysis) to find the main causes and accompanying causes of each problem faced, preparing innovative plans to solve the problems faced together (in group) and/or independently and communicate at class level. Lectures are carried out in the form of theory, assignments, seminars (qolokium) and workshops
References	**Main :**

1. Diamond, Ian. (Science Education in School, Issues, evidence, and Proposal. The Association for Science Programs
2. Jenkins, Edgar. (Ed) (2002) “Science and Technology Education Current Challenges and Possible Solutions” dipublikasikan dalam Innovations in □Science and Technology Education Vol VIII Paris, UNESCO Science and Technology

	Supporters:	
Supporting lecturer	Prof. Dr. Budi Jatmiko, M.Pd. Dr. I Gusti Made Sanjaya, M.Si.	

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	Understand the concept of problems and innovation in science education	1. Explain the meaning of innovation 2. Identify examples of innovation (products, ideas, etc.) 3. Conducting an analysis of the root causes of science education (Fish bone analysis	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment	Presentation, discussion and case method 2 x 50 minutes	Presentation, discussion and case method 2 x 50 minutes	**Material:** Introduction, orientation and assignment, definition of innovation **Literature:** **Material:** Identification and analysis of factors that cause problems in science education. **Reference:**	5%
2	Understand the concept of problems and innovation in science education	1. Explain the characteristics of innovation 2. Explain the innovation strategy	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment	Presentation, discussion, question and answer, and case method 2 x 50 minutes	Presentation, discussion, question and answer, and case method 2 x 50 minutes	**Material:** Characteristics and dissemination of innovation **Literature:**	5%
3	Collaboratively synthesize innovative ideas to solve science education problems	1. Synthesize innovative ideas to solve problems 2. Presenting the group's innovative ideas to solve science education problems	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment	Presentation, discussion, question and answer, and case method 2 x 50 minutes	Presentation, discussion, question and answer, and case method 2x50 minutes	**Material:** Forms of innovation in the work of the **Library group:**	5%
4	Collaboratively synthesize innovative ideas to solve science education problems	1. Synthesize innovative ideas to solve problems 2. Presenting the group's innovative ideas to solve science education problems	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment	Innovation presentation (group), discussion, reflection and case method 2 x 50 minutes	Innovation presentation (group), discussion, reflection and case method 2 x 50 minutes	**Material:** Forms of innovation in the work of the **Library group:**	5%
5	Collaboratively synthesize innovative ideas to solve science education problems	1. Synthesize innovative ideas to solve problems 2. Presenting the group's innovative ideas to solve science education problems	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment	Innovation presentation (group), discussion, reflection and case method 2 x 50 minutes	Innovation presentation (group), discussion, reflection and case method 2x50 minutes	**Material:** Forms of innovation in the work of the **Library group:**	5%

6	Collaboratively synthesize innovative ideas to solve science education problems	1. Synthesize innovative ideas to solve science education problems 2. Presenting the group's innovative ideas to solve science education problems	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment	Innovation presentation (group), discussion, reflection and case method 2 x 50 minutes	2 x 50 minutes	**Material:** Forms of innovation in the work of the **Library group:**	7%
7	Collaboratively synthesize innovative ideas to solve science education problems	1. Synthesize innovative ideas to solve science education problems 2. Presenting the group's innovative ideas to solve science education problems	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment	Innovation presentation (group), discussion, reflection and case method 2 x 50 minutes	Innovation presentation (group), discussion, reflection and case method 2 x 50 minutes	**Material:** Forms of innovation in the work of the **Library group:**	7%
8	Final Capabilities from TM-1 to TM-7	TM-1 indicators up to TM-7 indicators	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment	Written test or replacement UTS assignment 2 x 50 minutes	Written test or replacement UTS assignment 2 x 50 minutes	**Material:** Learning topics from TM-1 to TM-7 **Library:**	5%
9	Collaboratively synthesize innovative ideas to solve science education problems	1. Individually synthesize innovative ideas to solve science education problems 2. Present individual innovative ideas to solve science education problems	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment	Innovation Presentation (Individual), discussion, reflection and case method 3 x 50 minutes	Innovation Presentation (Individual), discussion, reflection and case method 3x50 minutes	**Material:** Forms of innovation in individual work **References:**	7%
10	Collaboratively synthesize innovative ideas to solve science education problems	1. Individually synthesize innovative ideas to solve science education problems 2. Present individual innovative ideas to solve science education problems	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment	Innovation Presentation (Individual), discussion, reflection and case method 3 x 50 minutes	Innovation Presentation (Individual), discussion, reflection and case method 3x50 minutes	**Material:** Forms of innovation in individual work **References:**	7%
11	Collaboratively synthesize innovative ideas to solve science education problems	1. Individually synthesize innovative ideas to solve science education problems 2. Present individual innovative ideas to solve science education problems	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment	Innovation Presentation (Individual), discussion, reflection and case method 3 x 50 minutes	Innovation Presentation (Individual), discussion, reflection and case method 3 x 50 minutes	**Material:** Forms of innovation in individual work **References:**	7%

12	Collaboratively synthesize innovative ideas to solve science education problems	1. Individually synthesize innovative ideas to solve science education problems 2. Present individual innovative ideas to solve science education problems	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment	Innovation Presentation (Individual), discussion, reflection and case method 3 x 50 minutes	Innovation Presentation (Individual), discussion, reflection and case method 3x50 minutes	**Material:** Forms of innovation in individual work **References:**	7%
13	Collaboratively synthesize innovative ideas to solve science education problems	1. Individually synthesize innovative ideas to solve science education problems 2. Present individual innovative ideas to solve science education problems	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment	Innovation Presentation (Individual), discussion, reflection and case method 3 x 50 minutes	Innovation Presentation (Individual), discussion, reflection and case method 3x50 minutes	**Material:** Forms of innovation in individual work **References:**	7%
14	Collaboratively synthesize innovative ideas to solve science education problems	1. Individually synthesize innovative ideas to solve science education problems 2. Present individual innovative ideas to solve science education problems	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment	Innovation Presentation (Individual), discussion, reflection and case method 3 x 50 minutes	Innovation Presentation (Individual), discussion, reflection and case method 3x50 minutes	**Material:** Forms of innovation in individual work **References:**	7%
15	Collaboratively synthesize innovative ideas to solve science education problems	1. Individually synthesize innovative ideas to solve science education problems 2. Present individual innovative ideas to solve science education problems	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment	Innovation Presentation (Individual), discussion, reflection and case method 3 x 50 minutes	Innovation Presentation (Individual), discussion, reflection and case method 3x50 minutes	**Material:** Forms of innovation in individual work **References:**	7%
16	Final Capabilities from TM-9 to TM-15	TM-9 indicators up to TM-15 indicators	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment	Written test or assignment to replace UAS 2 x 50 minutes	ice writing or giving a replacement assignment for UAS 2x50 minutes	**Material:** Learning topics from TM-9 to TM-15 **Library:**	7%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Project Results Assessment / Product Assessment	100%
		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** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities 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.