	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
HOTS and Literacy in Science Learning	8400102039	Study Program Elective Courses	T=2	P=0	ECTS=5.04	2	January 10, 2023

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
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Learning model: Case Studies

Program Learning Outcomes (PLO)

PLO study program which is charged to the course

PLO-12	2. Master the latest theories related to scientific knowledge and science education

Program Objectives (PO)

PO - 1	Analyzing research results on the development of high-level thinking skills (transfer, problem solving, decision making, critical thinking, and creative thinking) and literacy in science learning
PO - 2	Designing science learning for the development of higher order thinking skills and literacy
PO - 3	Designing assessments of higher order thinking skills and literacy

PLO-PO Matrix

P.O	PLO-12
PO-1	
PO-2	
PO-3	

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																

Short Course Description: This course facilitates students to study research results on the development of high-level thinking skills (transfer, problem solving, decision making, critical thinking and creative thinking) in science learning, designing science learning and assessments for the development of high-level thinking skills and/or literacy. Lectures are carried out using seminar, workshop and project methods. The assessment includes study products and design products.

References

Main :

1. Brookhart, S.M. (2010). How to Access HOTS in Your Classroom. Virginia: ASDC.
2. By Butterworth, John & Thwaites, Geoff. (2016). Thinking Skills: Critical Thinking and Problem Solving . Cambridge: Cambridge Press.
3. Ennis, R.H.(1996). Critical Thinking. Prentice Hall
4. OECD (2019), PISA 2018 Results (Volume I): What Students Know and Can Do , PISA, OECD Publishing, Paris, https://doi.org/10.1787/5f07c754-en
5. OECD (2019), PISA 2018 Results (Volume II): Where All Students Can Succeed , PISA, OECD Publishing, Paris, https://doi.org/10.1787/b5fd1b8f-en
6. OECD. (2015). Programme for International Students Assessment. http://www.oecd.org/pisa/ .
7. Peacock, A. (2000). Science Skills A Problem-solving Activities Book. London: Routledge.

Supporters:

1. Jurnal-jurnal dan referensi-referensi mutakhir yang relevan
2. Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Jurnal Pendidikan IPA Indonesia. 9. 248-256. 10.15294/jpii.v9i2.23208.

Supporting lecturer	Prof. Dr. Hj. Rudiana Agustini, M.Pd. Prof.Dr. Wahono Widodo, 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	Analyzing thinking skills	1. Describe thinking and reasoning skills 2. Analyzing question instruments for HOTS 3. Create questions for HOTS	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Participatory Activities	Flip learning and 2 X 50 Discussion	Case based: examining cases of HOTs/scientific literacy skills achievements of Indonesian students 2x 50	**Material:** HOTs **Reference:** *Brookhart, SM (2010). How to Access HOTS in Your Classroom. Virginia: ASDC.* **Material:** literacy **References:** *OECD (2019), PISA 2018 Results (Volume I): What Students Know and Can Do , PISA, OECD Publishing, Paris, https://doi.org/...* **Material:** Cases of scientific literacy achievement and AKM results **Library:** *Relevant up-to-date journals and references*	5%
2	Analyzing thinking skills	1. Describe thinking and reasoning skills 2. Analyzing question instruments for HOTS 3. Create questions for HOTS	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Flip learning and 2 X 50 Discussion	Case based: reviewing research cases of HOTs skills/scientific literacy to create PPTs and papers that are relevant to the dissertation plan 2x 45	**Material:** Critical thinking **Reference:** *Ennis, RH (1996). Critical Thinking. Prentice Hall* **Material:** HOTs **Reference:** *Brookhart, SM (2010). How to Access HOTS in Your Classroom. Virginia: ASDC.* **Material:** Scientific literacy **References:** *OECD (2019), PISA 2018 Results (Volume I): What Students Know and Can Do , PISA, OECD Publishing, Paris, https://doi.org/...* **Material:** Examples of Science Literacy research **Library:** *Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.*	7%
3	Analyzing thinking skills	1. Describe thinking and reasoning skills 2. Analyzing question instruments for HOTS 3. Create questions for HOTS	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Flip learning and 2 X 50 Discussion	Case based: reviewing research cases of HOTs skills/scientific literacy to create PPTs and papers that are relevant to the dissertation plan 2x50	**Material:** HOTs **Reference:** *Brookhart, SM (2010). How to Access HOTS in Your Classroom. Virginia: ASDC.* **Material:** Critical thinking **Reference:** *Ennis, RH (1996). Critical Thinking. Prentice Hall* **Material:** HOTs **Bibliography:** *By Butterworth, John & Thwaites, Geoff. (2016). Thinking Skills: Critical Thinking and Problem Solving. Cambridge: Cambridge Press.*	5%

4	Analyze, design learning and assess science learning for problem solving	1. Describe problem-solving thinking skills 2. Analyzing articles about the results of research on problem solving in science learning 3. Designing science learning and assessments for problem solving skills 4. Analyzing problem solving instruments	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Flip learning HOTs case analysis/scientific literacy, especially problem solving and discussion 2 X 50	Case based: reviewing research cases of HOTs skills/scientific literacy to create PPTs and papers that are relevant to the dissertation plan 2x50	**Material:** Problem solving **Reference:** *By Butterworth, John & Thwaites, Geoff. (2016). Thinking Skills: Critical Thinking and Problem Solving. Cambridge: Cambridge Press.*	7%
5	Analyze, design learning and assess science learning for problem solving	1. Describe problem-solving thinking skills 2. Analyzing articles about the results of research on problem solving in science learning 3. Designing science learning and assessments for problem solving skills 4. Analyzing problem solving instruments	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Participatory Activities	Flip learning, making problem solving case analysis, and discussions 2 X 50	Case based: reviewing research cases of HOTs skills/scientific literacy to create PPTs and papers that are relevant to the dissertation plan 2x50		7%
6	Analyze, design learning and assess science learning for problem solving	1. Describe problem-solving thinking skills 2. Analyzing articles about the results of research on problem solving in science learning 3. Designing science learning and assessments for problem solving skills 4. Analyzing problem solving instruments	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Participatory Activities	Flip learning, projects and discussions related to HOTs 2 X 50	Case based: reviewing research cases of HOTs skills/scientific literacy to create PPTs and papers that are relevant to the dissertation plan 2 x 50	**Material:** Problem solving **References:** *Peacock, A. (2000). Science Skills A Problem-solving Activities Book. London: Routledge.* **Material:** HOTs Assessment **Reference:** *Brookhart, SM (2010). How to Access HOTS in Your Classroom. Virginia: ASDC.*	5%

7	Analyzing, designing learning and assessing science learning for critical thinking	1. Describe critical thinking skills 2. Analyzing articles about the results of research on critical thinking in science learning 3. Designing science learning and assessments for critical thinking skills 4. Analyzing critical thinking question instruments	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Flip learning, projects, and discussions related to critical thinking 2 X 50	Case based: reviewing research cases of HOTs skills/scientific literacy to create PPTs and papers that are relevant to the dissertation plan 2 x 50	**Material:** Critical thinking **Reference:** *Ennis, RH (1996). Critical Thinking. Prentice Hall* **Material:** Critical thinking **Bibliography:** *By Butterworth, John & Thwaites, Geoff. (2016). Thinking Skills: Critical Thinking and Problem Solving. Cambridge: Cambridge Press.*	7%
8	Final capabilities from TM-1 to TM-7	Indicators from TM-1 to TM-7	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment, Test	Written test or assignment as a substitute for UTS 2 X 50	Written test or assignment as a substitute for UTS	**Material:** HOTs **Reference:** *Brookhart, SM (2010). How to Access HOTS in Your Classroom. Virginia: ASDC.* **Material:** Critical thinking **Bibliography:** *By Butterworth, John & Thwaites, Geoff. (2016). Thinking Skills: Critical Thinking and Problem Solving. Cambridge: Cambridge Press.* **Material:** Scientific literacy **Library:** *OECD. (2015). Program for International Students Assessment. http://www.oecd.org/... .* **Material:** problem solving **References:** *Peacock, A. (2000). Science Skills A Problem-solving Activities Book. London: Routledge.*	5%
9	Analyzing, designing learning and assessing science learning for critical thinking	1. Describe critical thinking skills 2. Analyzing articles about the results of research on critical thinking in science learning 3. Designing science learning and assessments for critical thinking skills 4. Analyzing critical thinking question instruments	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Flip learning, case studies followed by personal projects, and 2 X 50 discussions	Case study: making a science learning study that can improve HOTs/scientific literacy followed by formulating a 2x50 hypothetical learning model	**Material:** research case studies to improve HOTs and literacy **Library:** *Relevant recent journals and references* **Material:** examples **References:** *Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.*	7%

10	Analyzing, designing learning and assessing science learning for creative thinking	1. Describe creative thinking skills 2. Analyzing articles about research results on creative thinking in science learning 3. Designing science learning and assessments for creative thinking skills 4. Analyzing creative thinking question instruments	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Flip learning, projects and discussions 2 X 50	Case study: making a science learning study that can improve HOTs/scientific literacy followed by formulating a hypothetical 2 x 50 learning model	**Material:** case analysis **Literature:** *Relevant recent journals and references* **Material:** examples **References:** *Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.*	7%
11	Analyzing, designing learning and assessing science learning for creative thinking	1. Describe creative thinking skills 2. Analyzing articles about research results on creative thinking in science learning 3. Designing science learning and assessments for creative thinking skills 4. Analyzing creative thinking question instruments	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Participatory Activities	Flip learning, projects and discussions 2 X 50	Case study: making a science learning study that can improve HOTs/scientific literacy followed by formulating a hypothetical 2 x 50 learning model	**Material:** case analysis **Literature:** *Relevant recent journals and references* **Material:** examples **References:** *Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.*	5%
12	Analyzing, designing learning and assessing science learning for creative thinking	1. Describe creative thinking skills 2. Analyzing articles about research results on creative thinking in science learning 3. Designing science learning and assessments for creative thinking skills 4. Analyzing creative thinking question instruments	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Flip learning, projects and discussions 2 X 50	Case study: making a science learning study that can improve HOTs/scientific literacy followed by formulating a hypothetical 2 x 50 learning model	**Material:** case analysis **Literature:** *Relevant recent journals and references* **Material:** examples **References:** *Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.*	7%

13	Analyzing, designing learning and assessing science learning for scientific literacy	1. Describe scientific literacy 2. Analyzing articles about the results of scientific literacy research in science learning 3. Designing science lessons and assessments for scientific literacy 4. Analyzing scientific literacy question instruments	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Flip learning, projects and discussions 2 X 50	Case study: making a science learning study that can improve HOTs/scientific literacy followed by formulating a 2x50 hypothetical learning model	**Material:** case analysis **Literature:** *Relevant recent journals and references* **Material:** Scientific literacy **Library:** *OECD. (2015). Program for International Students Assessment. http://www.oecd.org/... .* **Material:** examples **References:** *Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.*	7%
14	Analyzing, designing learning and assessing science learning for scientific literacy	1. Describe scientific literacy 2. Analyzing articles about the results of scientific literacy research in science learning 3. Designing science lessons and assessments for scientific literacy 4. Analyzing scientific literacy question instruments	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Flip learning, projects and discussions 2 X 50	Case study: making a science learning study that can improve HOTs/scientific literacy followed by formulating a 2x50 hypothetical learning model	**Material:** Scientific literacy **Library:** *OECD. (2015). Program for International Students Assessment. http://www.oecd.org/... .* **Material:** for case studies **Literature:** *Relevant recent journals and references*	7%
15	Analyzing, designing learning and assessing science learning for scientific literacy	1. Describe scientific literacy 2. Analyzing articles about the results of scientific literacy research in science learning 3. Designing science lessons and assessments for scientific literacy 4. Analyzing scientific literacy question instruments	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Flip learning, projects and discussions 2 X 50	Case study: making a science learning study that can improve HOTs/scientific literacy followed by formulating a hypothetical 2 x 50 learning model	**Material:** for case analysis **Literature:** *Relevant recent journals and references* **Material:** research examples **Library:** *Widodo, Wahono & Sudibyo, Elok & Suryanti, Suryanti & Sari, Dhita & Inzanah, I. & Setiawan, Beni. (2020). The Effectiveness of Gadget-Based Interactive Multimedia in Improving Generation Z's Scientific Literacy. Indonesian Science Education Journal. 9. 248-256. 10.15294/jpii.v9i2.23208.*	7%
16	Final capabilities from TM-9 to TM-15	Indicators from TM-9 to TM-15	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Project Results Assessment / Product Assessment, Test	Written test or assignment as a substitute for UAS in the form of formulating a hypothetical learning model to improve HOTs/scientific literacy and ideas for supporting tools and instruments 2 X 50	Written test or assignment as a substitute for UAS in the form of formulating a hypothetical learning model to improve HOTs/scientific literacy and ideas for supporting tools and instruments 2 x 50	**Material:** for case analysis and formulation of hypothetical learning models **Library:** *Relevant journals and recent references*	5%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	56%
2.	Project Results Assessment / Product Assessment	39%
3.	Test	5%
		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.