



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																																																																																																				
Misconceptions and Changes in Conceptions	8400102043	Study Program Elective Courses	T=2 P=0 ECTS=5.04	2	January 10, 2023																																																																																																				
AUTHORIZATION	SP Developer		Course Cluster Coordinator		Study Program Coordinator																																																																																																				
	Prof. Dr. Suyono, M.Pd.		Prof. Dr. Suyono, 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-12	2. Master the latest theories related to scientific knowledge and science education																																																																																																							
	Program Objectives (PO)																																																																																																								
	PO - 1	Analyzing the results of research on misconceptions and changes in conceptions in science learning																																																																																																							
	PO - 2	Designing instruments and methods for analyzing misconceptions or changes in conceptions in science learning																																																																																																							
	PO - 3	Designing instruments and methods for analyzing misconceptions or changes in conceptions in science learning																																																																																																							
	PO - 4	Designing science learning strategies/methods that facilitate changes in conception																																																																																																							
	PLO-PO Matrix																																																																																																								
	<table border="1" style="margin: auto;"> <tr> <td style="width: 50px;">P.O</td> <td style="width: 100px;">PLO-12</td> </tr> <tr> <td>PO-1</td> <td></td> </tr> <tr> <td>PO-2</td> <td></td> </tr> <tr> <td>PO-3</td> <td></td> </tr> <tr> <td>PO-4</td> <td></td> </tr> </table>					P.O	PLO-12	PO-1		PO-2		PO-3		PO-4																																																																																											
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PO Matrix at the end of each learning stage (Sub-PO)																																																																																																									
<table border="1" style="margin: auto;"> <tr> <td rowspan="2" style="width: 50px;">P.O</td> <td colspan="16">Week</td> </tr> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td> </tr> <tr> <td>PO-1</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>PO-2</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>PO-3</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>PO-4</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>					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																
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Short Course Description	This course facilitates students to study research results on misconceptions and changes in conceptions, design science learning strategies/methods that facilitate changes in conceptions, and design instruments and methods for analyzing misconceptions or changes in conceptions. Lectures are carried out using seminar, workshop and project methods. The assessment includes study products and design products.																																																																																																								
References	Main :																																																																																																								
	<ol style="list-style-type: none"> 1. Allen, M. 2010. Misconceptions in Primary Science. Maidenhead: Open University Press. 2. Berg, Euwe van den. 1991. Miskonsepsi dan Remediasinya. Salatiga: UKSW Press. 3. Dreyfus, A., Jungwirth, E., Eliovitch, R. 1990. Applying the "cognitive conflict" strategy for conceptual change—some implications, difficulties, and problems. Science Education, 74(5) 555-569. 4. Driver, R.H., Guesne, E., & Tibengneim A. 1985. Children Ideas in Science. Philadelphia, PA: Open University Press. 5. Hasan, S., Bagayokod, D., and Ella L K. 1990. Misconceptions and the Certainty of Response Index (CRI). Physics Education, 34(5). 																																																																																																								
	Supporters:																																																																																																								
<ol style="list-style-type: none"> 1. Artikel terkait terbaru (10 Tahun terakhir) dari jurnal standar 2. Disertasi dengan Kajian Miskonsepsi dan Perubahan Konsepsi 																																																																																																									

Supporting lecturer		Prof. Dr. Suyono, 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	Create a narrative about ontology, epistemology and axiology of concepts as a scientific product.	1. Write a definition of a concept that can be used to answer three scientific questions. 2. Presents 3 examples of definitions of chemical concepts that contain the dimensions of ontology, epistemology and axiology.	Criteria: Based on the assessment rubric that has been created by the teaching lecturer Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	Search and reflection Discussion of the results of the reflection that has been made Question and answer. 2 X 50	-	Material: PPT entitled SCIENTIFIC PRODUCTS that each individual has created while taking the Philosophy of Science & STM course. References:	5%
2	Create a narrative about ontology, epistemology and axiology regarding conception.	1. Write a definition of conception that can be used to answer three scientific questions. 2. Presents 3 examples of chemical conceptions that contain the dimensions of ontology, epistemology and axiology.	Criteria: Based on the assessment rubric that has been created by the teaching lecturer Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	Review various related literature using the 2 X 50 reciprocal teaching reading strategy		Material: Textbook related to standards; Related and latest Library articles:	5%
3	Create a narrative about ontology, epistemology and axiology about misconceptions.	1. Write a definition of misconception that can be used to answer three scientific questions. 2. Presents 3 examples of chemical misconceptions that contain the dimensions of ontology, epistemology and axiology.	Criteria: Based on the assessment rubric that has been created by the teaching lecturer Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	Review various related literature using the 2 X 50 reciprocal teaching reading strategy		Material: Textbook related to standards; Related and latest Library articles:	5%
4	Create a narrative about ontology, epistemology and axiology regarding conceptual change.	1. Write a definition of conceptual change that can be used to answer three scientific questions. 2. Presents 3 examples of conceptual changes in chemistry.	Criteria: Based on the assessment rubric that has been created by the teaching lecturer Form of Assessment : Participatory Activities	Review various related literature using the 2 X 50 reciprocal teaching reading strategy		Material: Textbook related to standards; Related and latest Library articles:	5%
5	Write the results of a review of statements regarding concepts, conceptions, misconceptions and changes in conceptions contained/written in the related dissertation.	Produce clarification & verification tables for statements about concepts, conceptions, misconceptions and changes in conceptions in a related dissertation.	Criteria: Based on the assessment rubric that has been created by the teaching lecturer Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	Content Analysis by 2 X 50 students	-	Material: Related and latest articles that present Library Content Analysis :	7%
6	Write the results of a review of statements regarding concepts, conceptions, misconceptions and changes in conceptions contained/written in the related dissertation.	Produce clarification & verification tables for statements about concepts, conceptions, misconceptions and changes in conceptions in a related dissertation.	Criteria: Based on the assessment rubric that has been created by the teaching lecturer Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	Content Analysis by 2 X 50 students	-	Material: Content Library: Analysis	7%

7	Create a narrative about the concept construction (building) procedure to identify the possibility of alternative conceptions (misconceptions).	1. Produce worksheets to guide individuals in building concepts in the field of science. 2. Presents the results of identifying the possibility of developing alternative conceptions	Criteria: Based on the assessment rubric that has been created by the teaching lecturer Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	Internalize examples of similar worksheets that have been developed by course lecturers. Building leaf and flower concepts based on observational data. 2 X 50		Material: Related and latest articles References:	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	Written test or assignment as a substitute for UTS 2 X 50	-	Material: Learning topics from TM-1 to TM-7 Library:	5%
9	Produce a design for the latest way to diagnose the occurrence of misconceptions in the field of science in individuals.	Produce a design for an instrument to detect individual misconceptions in the field of science, especially chemistry.	Criteria: Based on the assessment rubric that has been created by the teaching lecturer Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	Instrument development tasks, according to the 2 X 50 development panel method		Material: Related and latest articles that present everything from CRI to multi-tier. References:	7%
10	Create a narrative about the occurrence of correct conceptions and misconceptions based on accommodation theory.	Produce 3 paragraphs containing an explanation of the occurrence of correct conceptions and the occurrence of misconceptions in individuals using Piaget's accommodation theory.	Criteria: Based on the assessment rubric that has been created by the teaching lecturer Form of Assessment : Project Results Assessment / Product Assessment	Applying the principles and laws of syllogism in developing the 2 X 50 thinking framework	-	Material: Textbook contains accommodation theory Literature:	7%
11	Create a narrative about the factors that cause misconceptions in individuals.	1. Reports on the results of reviews of various related scientific articles in the form of descriptions of the factors that cause misconceptions. 2. Book report results regarding factors influencing misconceptions about the thesis	Criteria: Based on the assessment rubric that has been created by the teaching lecturer Form of Assessment : Project Results Assessment / Product Assessment	Article Review and Book Report. 2 X 50	-	Material: Related and latest scientific articles. References:	7%
12	Create a narrative about 4 (four) ways to condition the accommodation process so that there is a change from a false conception to a true conception (thru conception).	Produce analysis results of scientific articles, especially on 4 ways of conditioning the accommodation process	Criteria: Based on the assessment rubric that has been created by the teaching lecturer Form of Assessment : Project Results Assessment / Product Assessment	Article Review and presentation of 2 X 50 results	-	Material: Related and latest scientific articles. References:	7%

13	Produce written reviews regarding the implementation of conceptual change strategies contained in scientific articles, including related dissertations.	Produce analysis results of scientific articles, especially regarding conceptual change strategies that have been implemented/researched.	Criteria: Based on the assessment rubric that has been created by the teaching lecturer Form of Assessment : Participatory Activities	Tests and Assignments 2 X 50	-	Material: Related and latest scientific articles; Lecturer research report file. References:	7%
14	Create a conceptual change strategy design that is different and more specific than the existing conceptual change strategy (looks new).	Draft CC strategy design that is different from previous strategies.	Criteria: Based on the assessment rubric that has been created by the teaching lecturer Form of Assessment : Project Results Assessment / Product Assessment	CC 2 X 50 strategy development practice		Material: Related and latest scientific articles. References:	7%
15	Create a conceptual change strategy design that is different and more specific than the existing conceptual change strategy (looks new).	Draft CC strategy design that is different from previous strategies.	Criteria: Based on the assessment rubric that has been created by the teaching lecturer Form of Assessment : Project Results Assessment / Product Assessment	CC 2 X 50 strategy development practice		Material: Related and latest scientific articles. References:	7%
16	Final capabilities from TM-9 to TM-15 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	Written test or assignment as a substitute for UAS 2 X 50		Material: Learning topics from TM-9 to TM-15 Library:	5%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	33.5%
2.	Project Results Assessment / Product Assessment	66.5%
		100%

Notes

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Forms of assessment:** test and non-test.
- 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.
- 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.
- Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
- 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%.
- TM=Face to face, PT=Structured assignments, BM=Independent study.

