	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
Integrated Science Learning	8400102014	Compulsory Study Program Subjects	T=2 P=0 ECTS=5.04	2	January 10, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	Prof. Dr. Wahono Widodo, M.Si	Prof. Dr. Erman, 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	Mastering the philosophical basis of the science learning curriculum in order to renew science education (Science)
PO - 2	Develop scientific theories, concepts and ideas in order to contribute to the development and practice of science in the field of science education in a comprehensive and contextual manner using an inter, multi and transdisciplinary approach
PO - 3	Develop integrated science learning tools
PO - 4	Develop students' attitudes, skills and abilities (cognitive, affective and psychomotor) in an integrated manner

PLO-PO Matrix

P.O	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	Examining the background, foundation, various models and methods, as well as cases of integrated science learning in order to develop integrated science learning tools according to dissertation ideas

References

Main :

1. Drake, Susan M. and Burns, Rebecca C. 2004. Integrated Curriculum. ASCD. Alexandria USA.
2. Fogatry, R. 1991. Ten ways to integrate curriculum . Association for Supervision and Curriculum Development. Retrieved form https://pdfs.semanticscholar.org/fc84/06745befdf07ad521450d7434df379c72c48.pdf
3. Lamanauskas, Vincentas and Vilkoniene, Margarita. 2008. European Dimension In Integrated Science Education. Siauliai University. Lithuania
4. Katarin Alinta MacLeod. 2012. Integrating Science, Technology, Society and Environment (STSE) into physics teacher education: Pre-service teachers' perceptions and challenges. A thesis
5. Angi Stone-MacDonald, Kristen Wendell, Anne Douglass, Mary Lu Love. 2015. of Engaging Young Engineers: Teaching Problem-Solving Skills Through STEM. Maryland: Paul H. Brookes Publishing Co.
6. Stephan Rist & Farid Dahdouh. 2006. A step towards the integration of scientific and indigenous forms of knowledge in the management of natural resources for the future. Environ Dev Sustain (2006) 8:467–493.

Supporters:

1. 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. Wahono Widodo, M.Si. Prof. Dr. Erman, 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	Examining the background & philosophical foundations of integrated science learning.	Able to explain the background and philosophical basis of integrated science learning.	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Participatory Activities	Lectures, Q&A, and case studies 2 X 50 minutes	Browse and study teaching materials, prepare PPT/studies according to your interests and upload them to SIDIA 100 minutes	**Material:** Overview of the science integration model **References:** **Material:** STSE **Reader:** *Katarin Alinta MacLeod. 2012. Integrating Science, Technology, Society and Environment (STSE) into physics teacher education: Pre-service teachers' perceptions and challenges. A thesis* **Material:** 10 integration models **References:** *Fogatry, R. 1991. Ten ways to integrate curriculum. Association for Supervision and Curriculum Development. Retrieved form https://pdfs.semanticscholar/.... org/fc84/06745befdf07ad521450d7434df379c72c48.pdf* **Material:** STEM **Readers:** *Angi Stone-MacDonald, Kristen Wendell, Anne Douglass, Mary Lu Love. 2015. of Engaging Young Engineers: Teaching Problem-Solving Skills Through STEM. Maryland: Paul H. Brookes Publishing Co.* **Material:** Example of an SSI article as a continuation of STSE **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.*	5%
2	Analyze the concept and application of integration with STSE	1.Analyze the STSE concept 2.Analyzing the implementation of integration with STSE	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Participatory Activities	Presentation, discussion, further study 2 X 50	Browse and study teaching materials, compile PPT/studies according to interests and upload study results on SIDIA 2 x 50'	**Material:** STSE **Reader:** *Katarin Alinta MacLeod. 2012. Integrating Science, Technology, Society and Environment (STSE) into physics teacher education: Pre-service teachers' perceptions and challenges. A thesis* **Material:** examples of SSI **Library articles:** *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%
3	Analyze STEM concepts and implementation	1.Analyze STEM concepts 2.Analyzing STEM implementation	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Participatory Activities	Presentation, discussion and analysis for further in-depth 2 X 50'	Browse and study teaching materials, compile PPT/studies according to interests and upload study results on SIDIA 2 x 50'	**Material:** STEM **Readers:** *Angi Stone-MacDonald, Kristen Wendell, Anne Douglass, Mary Lu Love. 2015. of Engaging Young Engineers: Teaching Problem-Solving Skills Through STEM. Maryland: Paul H. Brookes Publishing Co.*	5%
4	analyzing the concept and implementation of ethnoscience integrated learning	1.analyzing the concept of ethnoscience learning 2.analyzing the implementation of ethnoscience learning	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Participatory Activities	Presentation, discussion, further study 2 X 50'	Browse and study teaching materials, compile PPT/studies according to interests and upload study results on SIDIA 2 x 50'	**Material:** Ethnoscience **Reader:** *Stephan Rist & Farid Dahdouh. 2006. A step towards the integration of scientific and indigenous forms of knowledge in the management of natural resources for the future. Environ Dev Sustain (2006) 8:467–493.*	5%
5	analyzing the concept and implementation of nested model integrated learning	1.analyzing the concept of nested integrated learning 2.analyzing the implementation of nested integrated learning	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Participatory Activities	Presentation, discussion, further study 2 X 50'	Browse and study teaching materials, compile PPT/studies according to interests and upload study results on SIDIA 2 x 50'	**Material:** Nested **Bibliography:** *Fogatry, R. 1991. Ten ways to integrate curriculum. Association for Supervision and Curriculum Development. Retrieved form https://pdfs.semanticscholar/.... org/fc84/06745befdf07ad521450d7434df379c72c48.pdf*	5%
6	analyzing the concept and implementation of webbed model integrated learning	1.analyzing the integrated learning concept of the webbed model 2.analyzing the implementation of integrated learning with a webbed model	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Participatory Activities	Presentation, discussion, further study 2 X 50'	Browse and study teaching materials, compile PPT/studies according to interests and upload study results on SIDIA 2 x 50'	**Material:** webbed **Reference:** *Fogatry, R. 1991. Ten ways to integrate curriculum. Association for Supervision and Curriculum Development. Retrieved form https://pdfs.semanticscholar/.... org/fc84/06745befdf07ad521450d7434df379c72c48.pdf*	5%
7	analyzing the concept and implementation of integrated and networked learning models	1.analyzing the concept and implementation of integrated learning models 2.analyzing the concept and implementation of networked model integrated learning	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Form of Assessment** : Participatory Activities	Presentation, discussion, further study 2 X 50'	Browse and study teaching materials, compile PPT/studies according to interests and upload study results on SIDIA 2 x 50'	**Material:** integrated and networked **Reference:** *Fogatry, R. 1991. Ten ways to integrate curriculum. Association for Supervision and Curriculum Development. Retrieved form https://pdfs.semanticscholar/.... org/fc84/06745befdf07ad521450d7434df379c72c48.pdf*	5%

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 giving replacement UTS assignments via SIDIA 2 x 50'	**Material:** Learning topics from TM-1 to TM-7 **Library:**	8%
9	Create mapping for integrated science learning plans	Create a mapping for an integrated science learning plan according to the chosen integration model/approach	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	workshops, discussions and assignments 2 X 50'	Uploading mapping results on SIDIA 2 x 50'	**Material:** 10 **References:** *Fogatry, R. 1991. Ten ways to integrate curriculum. Association for Supervision and Curriculum Development. Retrieved form https://pdfs.semanticscholar/.... org/fc84/06745befdf07ad521450d7434df379c72c48.pdf* **Material:** STeM **Readers:** *Angi Stone-MacDonald, Kristen Wendell, Anne Douglass, Mary Lu Love. 2015. of Engaging Young Engineers: Teaching Problem-Solving Skills Through STEM. Maryland: Paul H. Brookes Publishing Co.* **Material:** ethnoscience **Bibliography:** *Stephan Rist & Farid Dahdouh. 2006. A step towards the integration of scientific and indigenous forms of knowledge in the management of natural resources for the future. Environ Dev Sustain (2006) 8:467–493.* **Material:** STSE **Reader:** *Katarin Alinta MacLeod. 2012. Integrating Science, Technology, Society and Environment (STSE) into physics teacher education: Pre-service teachers' perceptions and challenges. A thesis*	7%
10	1. Create mapping for integrated science learning plans 2. Designing learning objectives and indicators for achieving integrated science learning objectives based on the mapping created	1. Create a mapping for an integrated science learning plan according to the chosen integration model/approach 2. Designing learning objectives and indicators for achieving integrated science learning objectives based on the mapping created	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	workshops, presentations, discussions and assignments 2 X 50'	Uploading goal and indicator results in SIDIA 2 x 50'	**Material:** 10 **References:** *Fogatry, R. 1991. Ten ways to integrate curriculum. Association for Supervision and Curriculum Development. Retrieved form https://pdfs.semanticscholar/.... org/fc84/06745befdf07ad521450d7434df379c72c48.pdf* **Material:** STeM **Readers:** *Angi Stone-MacDonald, Kristen Wendell, Anne Douglass, Mary Lu Love. 2015. of Engaging Young Engineers: Teaching Problem-Solving Skills Through STEM. Maryland: Paul H. Brookes Publishing Co.* **Material:** ethnoscience **Bibliography:** *Stephan Rist & Farid Dahdouh. 2006. A step towards the integration of scientific and indigenous forms of knowledge in the management of natural resources for the future. Environ Dev Sustain (2006) 8:467–493.* **Material:** STSE **Reader:** *Katarin Alinta MacLeod. 2012. Integrating Science, Technology, Society and Environment (STSE) into physics teacher education: Pre-service teachers' perceptions and challenges. A thesis*	7%
11	1. Designing learning objectives and indicators for achieving integrated science learning objectives based on the mapping created 2. Develop assessment instruments	1. Designing learning objectives and indicators for achieving integrated science learning objectives based on the mapping created 2. Develop an instrument for assessing the achievement of integrated science learning objectives based on the indicators created	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	workshops, discussions and assignments 2 X 50'	Uploading goal and indicator results in SIDIA 2 x 50'	**Material:** 10 **References:** *Fogatry, R. 1991. Ten ways to integrate curriculum. Association for Supervision and Curriculum Development. Retrieved form https://pdfs.semanticscholar/.... org/fc84/06745befdf07ad521450d7434df379c72c48.pdf* **Material:** STeM **Readers:** *Angi Stone-MacDonald, Kristen Wendell, Anne Douglass, Mary Lu Love. 2015. of Engaging Young Engineers: Teaching Problem-Solving Skills Through STEM. Maryland: Paul H. Brookes Publishing Co.* **Material:** ethnoscience **Bibliography:** *Stephan Rist & Farid Dahdouh. 2006. A step towards the integration of scientific and indigenous forms of knowledge in the management of natural resources for the future. Environ Dev Sustain (2006) 8:467–493.* **Material:** STSE **Reader:** *Katarin Alinta MacLeod. 2012. Integrating Science, Technology, Society and Environment (STSE) into physics teacher education: Pre-service teachers' perceptions and challenges. A thesis*	9%

12	Developing LKPD	Develop integrated science learning LKPD according to learning objectives and dissertation ideas	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	workshops, discussions and assignments 2 X 50'	Uploading results on SIDIA 2 x 50'	**Material:** 10 **References:** *Fogatry, R. 1991. Ten ways to integrate curriculum. Association for Supervision and Curriculum Development. Retrieved form https://pdfs.semanticscholar/.... org/fc84/06745befdf07ad521450d7434df379c72c48.pdf* **Material:** STeM **Readers:** *Angi Stone-MacDonald, Kristen Wendell, Anne Douglass, Mary Lu Love. 2015. of Engaging Young Engineers: Teaching Problem-Solving Skills Through STEM. Maryland: Paul H. Brookes Publishing Co.* **Material:** ethnoscience **Bibliography:** *Stephan Rist & Farid Dahdouh. 2006. A step towards the integration of scientific and indigenous forms of knowledge in the management of natural resources for the future. Environ Dev Sustain (2006) 8:467–493.* **Material:** STSE **Reader:** *Katarin Alinta MacLeod. 2012. Integrating Science, Technology, Society and Environment (STSE) into physics teacher education: Pre-service teachers' perceptions and challenges. A thesis*	7%
13	Develop teaching materials	Develop integrated science learning teaching materials according to learning objectives and dissertation ideas	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	workshops, discussions and assignments 2 X 50'	Uploading results on SIDIA 2 x 50'	**Material:** 10 **References:** *Fogatry, R. 1991. Ten ways to integrate curriculum. Association for Supervision and Curriculum Development. Retrieved form https://pdfs.semanticscholar/.... org/fc84/06745befdf07ad521450d7434df379c72c48.pdf* **Material:** STeM **Readers:** *Angi Stone-MacDonald, Kristen Wendell, Anne Douglass, Mary Lu Love. 2015. of Engaging Young Engineers: Teaching Problem-Solving Skills Through STEM. Maryland: Paul H. Brookes Publishing Co.* **Material:** ethnoscience **Bibliography:** *Stephan Rist & Farid Dahdouh. 2006. A step towards the integration of scientific and indigenous forms of knowledge in the management of natural resources for the future. Environ Dev Sustain (2006) 8:467–493.* **Material:** STSE **Reader:** *Katarin Alinta MacLeod. 2012. Integrating Science, Technology, Society and Environment (STSE) into physics teacher education: Pre-service teachers' perceptions and challenges. A thesis*	5%
14	Developing integrated science learning scenarios	1. Develop integrated science learning scenarios according to learning objectives and dissertation ideas 2. Package objectives, indicators, learning scenarios, LKPD, and assessment instruments into Teaching Modules	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	workshops, discussions and assignments 2 X 50'	Uploading results on SIDIA 2 x 50'	**Material:** 10 **References:** *Fogatry, R. 1991. Ten ways to integrate curriculum. Association for Supervision and Curriculum Development. Retrieved form https://pdfs.semanticscholar/.... org/fc84/06745befdf07ad521450d7434df379c72c48.pdf* **Material:** STeM **Readers:** *Angi Stone-MacDonald, Kristen Wendell, Anne Douglass, Mary Lu Love. 2015. of Engaging Young Engineers: Teaching Problem-Solving Skills Through STEM. Maryland: Paul H. Brookes Publishing Co.* **Material:** ethnoscience **Bibliography:** *Stephan Rist & Farid Dahdouh. 2006. A step towards the integration of scientific and indigenous forms of knowledge in the management of natural resources for the future. Environ Dev Sustain (2006) 8:467–493.* **Material:** STSE **Reader:** *Katarin Alinta MacLeod. 2012. Integrating Science, Technology, Society and Environment (STSE) into physics teacher education: Pre-service teachers' perceptions and challenges. A thesis*	5%
15	Develop integrated science learning plans	1. Develop integrated science learning scenarios according to learning objectives and dissertation ideas 2. Package objectives, indicators, learning scenarios, LKPD, and assessment instruments into Teaching Modules	**Criteria:** Based on the assessment rubric that has been created by the teaching lecturer **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	presentation and discussion of development results 2 X 50'	Uploading results on SIDIA 2 x 50'	**Material:** 10 **References:** *Fogatry, R. 1991. Ten ways to integrate curriculum. Association for Supervision and Curriculum Development. Retrieved form https://pdfs.semanticscholar/.... org/fc84/06745befdf07ad521450d7434df379c72c48.pdf* **Material:** STeM **Readers:** *Angi Stone-MacDonald, Kristen Wendell, Anne Douglass, Mary Lu Love. 2015. of Engaging Young Engineers: Teaching Problem-Solving Skills Through STEM. Maryland: Paul H. Brookes Publishing Co.* **Material:** ethnoscience **Bibliography:** *Stephan Rist & Farid Dahdouh. 2006. A step towards the integration of scientific and indigenous forms of knowledge in the management of natural resources for the future. Environ Dev Sustain (2006) 8:467–493.* **Material:** STSE **Reader:** *Katarin Alinta MacLeod. 2012. Integrating Science, Technology, Society and Environment (STSE) into physics teacher education: Pre-service teachers' perceptions and challenges. A thesis*	5%

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 2 X 50		**Material:** Learning topics from TM-9 to TM-15 **Library:**	12%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	57.5%
2.	Project Results Assessment / Product Assessment	32.5%
3.	Test	10%
		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.