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

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Natural Science Studies III	8410102218		T=2	P=0	ECTS=4.48	0	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	Dr. Eko Hariyono, S.Pd., M.Pd.

Learning model	**Case Studies**	
Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**	
	Program Objectives (PO)	
	PO - 1	Mastering a structured study of the role of the Earth as a complex physical system in human life.
	PO - 2	Mastering the dynamic aspects of interdependence between Earth and humans.
	PO - 3	Understanding various potential earth disasters including geological and hydrometeorological disasters in Indonesia.
	PO - 4	Understand the role of disaster science education at universities in introducing disaster mitigation studies and building disaster preparedness.
	PO - 5	Understand the concepts of disaster risk reduction, community resilience, and disaster risk management.
	PO - 6	Understand the concept of Sustainable Development Goals (SDGs) in geophysical science education and local wisdom-based disaster mitigation studies.
	PLO-PO Matrix	

P.O
PO-1
PO-2
PO-3
PO-4
PO-5
PO-6

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																
PO-5																
PO-6																

Short Course Description	Science Study III studies earth science with class discussion topics including understanding the role of the Earth (land, ocean, atmosphere and biosphere) in human life; interaction between humans and nature; the impact of human activities on nature and the environment; types of earth disasters that often occur in Indonesia and how to deal with them; disaster awareness and preparedness as part of disaster mitigation education to reduce disaster risk; understanding and application of local wisdom in disaster mitigation education; the concept of Earth Science Literacy Principles (ESLP) and Sustainable Development Goals (SDGs) in geophysical science education and local wisdom-based disaster studies
References	**Main :**

1. Acecolla, V. 2021. Volcano-Tectonic Processes (in Advances in Volcanology, an official Book Series of the International Association of Volcanology and Chemistry of the Earth's Interior – IAVCEI, Barcelona, Spain). Edited by Karoly Nemeth. Cham, Switzerland: Springer Nature AG, pp 1-552.
2. Amri, A., Bird, D. K., Ronan, K., Haynes, K. and Towers, B. 2017, Disaster Risk Reduction education in Indonesia: Challenges and recommendations for scaling up. Natural Hazards and Earth System Sciences Discussions, Vol. 17, Issue 4, pp. 595- 612.
3. Amri, A., Lassa, J. A., Tebe, Y., Hanifa, N. R., Kumar, J. and Sagala, S. 2022. Pathways to Disaster Risk Reduction education integration in schools: Insights from SPAB evaluation in Indonesia. International Journal of Disaster Risk Reduction, Vol. 73, No. 102860, pp. 1-13.
4. Beer, T. 2010. Geophysical Hazards: Minimizing Risk, Maximizing Awareness. London, UK: Springer, pp. 1-262.
5. Cummins, P. R. 2017. Geohazards in Indonesia: Earth Science for Disaster Risk Reduction – Introduction. Geological Society of London: Special Publications, Vol. 441, pp. 1-7.
6. Fearnley, C. J., Bird, D. K., Haynes, K., McGuire, W. J. and Jolly, G. 2018. Observing the Volcano World: Volcano Crisis Communication ((in Advances in Volcanology, an official Book Series of the International Association of Volcanology and Chemistry of the Earth's Interior – IAVCEI, Barcelona, Spain). Edited by Karoly Nemeth. Cham, Switzerland: Springer Nature AG, pp 1-771.
7. IOS/EVS/PI/105 REV. 2010. Evaluation of UNESCO's contribution to Strategic Programme Objective 5: Disaster Preparedness and Mitigation. Paris, France: United Nations Educational, Scientific and Cultural Organization, pp. 1-60.
8. James, B. 2007. Disaster Preparedness and Mitigation: UNESCO'S role. Paris, France: United Nations Educational, Scientific and Cultural Organization, pp. 1-48.
9. Strong, K., Carpenter, O. and Ralph, D. 2020. Scenario Best Practices: Developing Scenarios for Disaster Risk Reduction. Cambridge, UK: Cambridge Centre for Risk Studies at the University of Cambridge Judge Business School and Lighthill Risk Network, pp. 1-44.

Supporters:	

Supporting lecturer	

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 role of Earth's components (land, ocean, atmosphere and biosphere) in human life			Contextual Learning Discussion Questions and answers		**Material:** Earth as a dynamic physical system **References:** **Material:** Land as a system that provides life. **Literature:** **Material:** Atmosphere and oceans as life support systems **References:** **Material:** Biosphere as a balancing system for life **References:**	0%
2	Understand the influence of human activities on nature and the environment	Able to explain the influence of human activities on nature and the environment.		Contextual Learning Discussion Questions and answers		**Material:** Reciprocal relationship between humans and the Earth **Library:** **Material:** Impact of human activities on nature and the environment **References:**	0%
3				Contextual Learning Discussion Questions and answers		**Material:** Geological disasters (non-anthropogenic) **References:** **Material:** Types of volcanoes **Reference:** **Material:** Volcanic eruptions **References:** **Material:** Impact of volcanic eruptions **References:** **Material:** Mitigation of eruption disasters **References:**	0%

4	Understand the potential threat of geological (non-anthropogenic) disasters on a local and regional scale	Able to explain the potential threat of geological (non-anthropogenic) disasters on a local and regional scale		Contextual Learning Discussion Questions and answers		**Material:** Characteristics of tectonic earthquakes **References:** **Material:** Impact of tectonic earthquakes **References:** **Material:** Tsunami trigger source **Reference:** **Material:** Characteristics of tsunamis **Literature:** **Material:** Impact of the tsunami **Reference:** **Material:** Geological disaster mitigation **References:**	0%
5	Understanding the potential threat of hydrometeorological (anthropogenic) disasters on a global scale	Able to explain the potential threat of hydrometeorological (anthropogenic) disasters on a global scale		Contextual Learning Discussion Questions and answers		**Material:** Hydrometeorological (anthropogenic) disasters **References:** **Material:** Flash floods **References:** **Material:** Landslides **Literature:** **Material:** Forest and land fires **Reference:** **Material:** Bibliography Drought **:** **Material:** Hydrometeorological disaster mitigation **References:**	0%
6	Understanding the potential threat of hydrometeorological (anthropogenic) disasters on a global scale	Able to explain the potential threat of hydrometeorological (anthropogenic) disasters on a global scale		Contextual Learning Discussion Questions and answers		**Material:** Hydrometeorological (anthropogenic) disasters **References:** **Material:** Flash floods **References:** **Material:** Landslides **Literature:** **Material:** Forest and land fires **Reference:** **Material:** Bibliography Drought **:** **Material:** Hydrometeorological disaster mitigation **References:**	0%

7	Understand the impact of global warming and climate change on various areas of life on a local, regional and global scale	Able to explain the impact of global warming and climate change on various areas of life on a local, regional and global scale		Contextual Learning Discussion Questions and answers		**Material:** Spatial and temporal measures **References:** **Material:** Local, regional and global impacts **References:** **Material:** Short and long term impacts **References:**	0%
8	UTS	UTS	**Form of Assessment** : Test	UTS			0%
9	Implementing disaster science education in introducing the concept of minimizing risk and maximizing awareness as part of a culture of preparedness for disasters	Realizing disaster science education by introducing the concept of minimizing risk and maximizing awareness as part of a culture of preparedness for disasters		Contextual Learning Discussion Questions and answers		**Material:** Disaster mitigation education **Reference:** **Material:** Concept of minimizing disaster risk **References:** **Material:** Concept of maximizing awareness of disasters **References:** **Material:** Culture of preparedness for disaster threats **Reference:**	0%
10	Apply the concepts of disaster risk reduction, community resilience, and disaster risk management in simple activities at schools or universities			Context learning Discussion Questions and Answers		**Material:** Disaster mitigation education **Reference:** **Material:** Disaster risk reduction efforts **Reference:** **Material:** Community Resilience **Literature:** **Material:** Disaster risk management **References:**	0%
11	Applying the principles of earth science literacy and the concept of Sustainable Development Goals (SDGs) in local wisdom-based disaster mitigation studies in the form of simple activities at schools or universities	Realizing the principles of earth science literacy and the concept of Sustainable Development Goals (SDGs) in local wisdom-based disaster mitigation studies in the form of simple activities at schools or universities		Context Learning Discussion Questions and Answers		**Material:** Principles of earth science literacy **References:** **Material:** SDGs Concept **Literature:** **Material:** Disaster mitigation studies based on local wisdom **References:**	0%
12	Applying the principles of earth science literacy and the concept of Sustainable Development Goals (SDGs) in local wisdom-based disaster mitigation studies in the form of simple activities at schools or universities	Realizing the principles of earth science literacy and the concept of Sustainable Development Goals (SDGs) in local wisdom-based disaster mitigation studies in the form of simple activities at schools or universities		Context Learning Discussion Questions and Answers		**Material:** Principles of earth science literacy **References:** **Material:** SDGs Concept **Literature:** **Material:** Disaster mitigation studies based on local wisdom **References:**	0%

13	Understanding various important issues regarding earth disasters (anthropogenic and non-anthropogenic) through making thematic posters and group thematic poster presentations	Able to explain various important issues regarding earth disasters (anthropogenic and non-anthropogenic) through making thematic posters and group thematic poster presentations		Project-Based Learning Poster Presentation Discussion Questions and Answers		**Material:** Thematic poster related to disaster mitigation studies (active students) **References:**	0%
14	Understanding various important issues regarding earth disasters (anthropogenic and non-anthropogenic) through making thematic posters and group thematic poster presentations	Able to explain various important issues regarding earth disasters (anthropogenic and non-anthropogenic) through making thematic posters and group thematic poster presentations		Project-Based Learning Poster Presentation Discussion Questions and Answers		**Material:** Thematic poster related to disaster mitigation studies (active students) **References:**	0%
15	Understanding various important issues regarding earth disasters (anthropogenic and non-anthropogenic) through making thematic posters and group thematic poster presentations	Able to explain various important issues regarding earth disasters (anthropogenic and non-anthropogenic) through making thematic posters and group thematic poster presentations		Project-Based Learning Poster Presentation Discussion Questions and Answers		**Material:** Thematic poster related to disaster mitigation studies (active students) **References:**	0%
16	UAS	UAS	**Form of Assessment** : Test				0%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
		0%

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.