



Universitas Negeri Surabaya
Faculty of Mathematics and Natural Sciences
Undergraduate Physics Study Program

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight	SEMESTER	Compilation Date
Earth Disaster Mitigation	4520102247		T=2 P=0 ECTS=3.18	6	July 17, 2024
AUTHORIZATION	SP Developer		Course Cluster Coordinator		Study Program Coordinator
		Prof. Dr. Munasir, S.Si., M.Si.

Learning model	Project Based Learning
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Program Learning Outcomes (PLO)	PLO study program that is charged to the course
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Program Learning Outcomes (PLO)	Program Objectives (PO)
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PO - 1	Students know the objectives, scope, lecture procedures and students are able to understand the meaning of disaster, the concept of vulnerability, and the concept of disaster risk.
PO - 2	Students are able to explain the meaning of disaster mitigation, describe the scope of disaster mitigation, are able to explain the geological position, describe the geological position of the Indonesian archipelago through maps, the meeting between plates, the impact of disasters that are most likely to occur in Indonesia as a result of the geological position, describe the reality of the ring of fire for Indonesian archipelago, able to explain the meaning of earthquakes, explain the factors that cause earthquakes, explain types of earthquakes, explain the actions that residents need to take when an earthquake occurs, explain the relationship between earthquakes and the chance of tsunamis, and describe development concepts.
PO - 3	Students are able to explain the meaning of earthquakes, explain the factors that cause earthquakes, explain types of earthquakes, explain the actions that residents need to take when an earthquake occurs, explain the relationship between earthquakes and the chance of tsunamis, and describe development concepts.
PO - 4	Students are able to explain the process of volcanic eruptions, variations in types of volcanic eruptions, characteristics of pre-volcanic symptoms, characteristics of post-volcanic symptoms, variations in volcanic materials, actions that residents need to take when volcanic eruptions occur, and describe the zoning of areas affected by eruptions through maps.
PO - 5	Students are able to explain the process of landslide danger, the factors that cause landslides, various actions or efforts to minimize the impact of landslides, show the potential for landslide danger through maps, and describe effective socialization for residents to prevent and overcome landslides, understanding social disasters, various factors causes of social disasters, efforts to anticipate social disasters, and various strategic efforts to overcome social disasters.
PO - 6	Students are able to understand and scope of development, the importance of accommodating development efforts, and identify various disaster-based development efforts, the meaning and objectives of development policies, the background of integrating disasters in development policies, show examples of development policies in Indonesia that are directly related to disasters and demonstrate examples of disaster management policies in several developed countries, such as Japan and the USA.

PLO-PO Matrix

	<table border="1" style="margin: auto;"> <tr><td>P.O</td></tr> <tr><td>PO-1</td></tr> <tr><td>PO-2</td></tr> <tr><td>PO-3</td></tr> <tr><td>PO-4</td></tr> <tr><td>PO-5</td></tr> <tr><td>PO-6</td></tr> </table>	P.O	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6
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PO Matrix at the end of each learning stage (Sub-PO)

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Short Course Description	This course examines the concept of disasters, disaster classification, geological concepts, geomorphology, disaster climatology, natural disasters, non-natural disasters, analysis of potential disasters in Indonesia, climatological disaster mitigation analysis, volcanism disaster mitigation analysis, technological disaster mitigation analysis, disaster mitigation analysis disease outbreaks, and analysis of social disaster mitigation. Lectures are carried out using discussions and expositorys as well as assignments in mastering concepts and instilling a sense of responsibility and awareness in carrying out disaster mitigation.																																																																																																																																																							
References	<p>Main :</p> <ol style="list-style-type: none"> Coburn and Spence. 1994. <i>Disaster Mitigation</i>. United Kingdom: Cambridge Arschitectural. Agung Mulyo. 2004. <i>Pengantar Ilmu Kebumian</i>. Bandung: Pustaka Setia. L Don and Leet. 1964. <i>Gempa Bumi; Penyelidikan Ilmiah dan Sederhana</i>. Yogyakarta: Kreasi Wacana. TIM. 2019. <i>Panduan Pembelajaran Kebencanaan Untuk Mahasiswa di Perguruan Tinggi</i>. Jakarta: Direktorat Jenderal Pembelajaran dan Kemahasiswaan Kementerian Riset Teknologi dan Pendidikan Tinggi. Madlazim. (2015). <i>Buku Fisika Bumi Seri Seismologi</i>. Surabaya: Unipress UNESA. Don and Leet (1964), <i>Gempa Bumi ; Penyelidikan Ilmiah dan Sederhana</i>, Yogyakarta : Kreasi Wacana. Agung Mulyo (2004). <i>Pengantar Ilmu Kebumian</i>, Bandung : Pustaka Setia. <p>Supporters:</p> <ol style="list-style-type: none"> jurnal, artikel, website yang relevan dan reliable 																																																																																																																																																							
Supporting lecturer	Prof. Tjipto Prastowo, Ph.D. Mita Anggaryani, M.Pd., Ph.D. Arie Realita, M.Si. Muhammad Nurul Fahmi, S.Si., 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	Students understand the scope and objectives of the mitigation course, the understanding and scope of concepts directly related to disasters, such as disasters, vulnerabilities, hazards, risks and disaster mitigation.	□ Discuss the course syllabus, objectives, scope, procedures, lectures, assignments that students must carry out, exams that must be taken and sources that support this course.	Criteria: Individual Form of Assessment : Participatory Activities	Contextual Learning Discussion Questions and Answers 2 x 50	Contextual Learning Discussion Questions and Answers 2 x 50	Material: Earth Science Library: <i>Agung Mulyo (2004). Introduction to Earth Science, Bandung: Pustaka Setia.</i>	1%																																																																																																																																																	
2	Students understand the scope and objectives of the mitigation course, the understanding and scope of concepts directly related to disasters, such as disasters, vulnerabilities, hazards, risks and disaster mitigation.	Explain the meaning and scope of disasters, vulnerabilities, risks, and impacts of a disaster.	Criteria: Individual Form of Assessment : Participatory Activities	Contextual Learning Discussion Questions and Answers 2 x 50	Contextual Learning Discussion Questions and Answers 2 x 50	Material: Earth Science Library: <i>Agung Mulyo (2004). Introduction to Earth Science, Bandung: Pustaka Setia.</i>	1%																																																																																																																																																	

3	Able to understand the meaning, scope and objectives of disaster mitigation and able to master describing the geological position of the Indonesian archipelago and its implications for potential disasters.	Explain the meaning of disaster mitigation, the scope of disaster mitigation, the objectives and essence of disaster mitigation.	Criteria: Individual Form of Assessment : Participatory Activities	Contextual Learning Discussion Questions and Answers 2 x 50	Contextual Learning Discussion Questions and Answers 2 x 50	Material: Disaster Mitigation References: <i>Coburn and Spence. 1994. Disaster Mitigation . United Kingdom: Cambridge Architectural. Agung Mulyo. 2004. Introduction to Earth Science . Bandung: Pustaka Setia. L Don and Leet. 1964. Earthquake; Scientific and Simple Inquiry . Yogyakarta: Discourse Creations. TEAM. 2019. Disaster Learning Guide for Students in Higher Education. Jakarta: Directorate General of Learning and Student Affairs, Ministry of Research, Technology and Higher Education.</i>	1%
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4	Able to understand the meaning, scope and objectives of disaster mitigation and able to master describing the geological position of the Indonesian archipelago and its implications for potential disasters.	<ol style="list-style-type: none"> 1.Explain the geological position of Indonesia 2.Explain the impact of disasters that are most likely to occur in Indonesia as a result of geological position. 	<p>Criteria: Individual</p> <p>Form of Assessment : Participatory Activities</p>	Contextual Learning Discussion Questions and Answers 2 x 50	Contextual Learning Discussion Questions and Answers 2 x 50	<p>Material: Disaster Mitigation</p> <p>References: <i>Coburn and Spence. 1994. Disaster Mitigation . United Kingdom: Cambridge Architectural. Agung Mulyo. 2004. Introduction to Earth Science . Bandung: Pustaka Setia. L Don and Leet. 1964. Earthquake; Scientific and Simple Inquiry . Yogyakarta: Discourse Creations. TEAM. 2019. Disaster Learning Guide for Students in Higher Education. Jakarta: Directorate General of Learning and Student Affairs, Ministry of Research, Technology and Higher Education.</i></p>	1%
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5	Able to understand the meaning, scope and objectives of disaster mitigation and able to master describing the geological position of the Indonesian archipelago and its implications for potential disasters.	Describes the reality of the ring of fire for the Indonesian archipelago.	Criteria: Individual Form of Assessment : Participatory Activities	Contextual Learning Discussion Questions and Answers 2 x 50	Contextual Learning Discussion Questions and Answers 2 x 50	Material: Disaster Mitigation References: <i>Coburn and Spence. 1994. Disaster Mitigation . United Kingdom: Cambridge Architectural. Agung Mulyo. 2004. Introduction to Earth Science . Bandung: Pustaka Setia. L Don and Leet. 1964. Earthquake; Scientific and Simple Inquiry . Yogyakarta: Discourse Creations. TEAM. 2019. Disaster Learning Guide for Students in Higher Education. Jakarta: Directorate General of Learning and Student Affairs, Ministry of Research, Technology and Higher Education.</i>	1%
6	Students are able to analyze the occurrence of earthquake disasters.	<ol style="list-style-type: none"> 1.Explain the meaning of earthquake. 2.Explain the background to the causes of earthquakes. 	Criteria: Individual Form of Assessment : Project Results Assessment / Product Assessment	Contextual Learning Discussion Questions and Answers 2 x 50	Contextual Learning Discussion Questions and Answers 2 x 50	Material: Earthquakes Reference: <i>Don and Leet (1964), Earthquakes; Scientific and Simple Research, Yogyakarta: Discourse Creations.</i>	5%
7	Students are able to analyze the occurrence of earthquake disasters.	<ol style="list-style-type: none"> 1.Explains the process of an earthquake, accompanied by pictures and photos. 2.Explains the impact of earthquakes on life, accompanied by pictures and photos 3.Explain the relationship between earthquakes and the chance of a tsunami, accompanied by pictures. 	Criteria: Individual Form of Assessment : Project Results Assessment / Product Assessment	Contextual Learning Discussion Questions and Answers 2 x 50	Contextual Learning Discussion Questions and Answers 2 x 50	Material: Earthquakes Reference: <i>Don and Leet (1964), Earthquakes; Scientific and Simple Research, Yogyakarta: Discourse Creations.</i>	5%

8	UTS	UTS	Criteria: 1. Test 2. Individual Form of Assessment : Test	UTS 2 x 50	UTS 2 x 50	Material: Earth Physics Library: <i>Madlazim. (2015). Seismology Series Earth Physics Book. Surabaya: Unipress UNESA.</i>	20%
9	Able to analyze the occurrence of volcanic disasters.	1. Explain the meaning of volcanic characteristics 2. Explain the background to the causes of volcanic eruptions 3. Explain the types of volcanic eruptions, prevolcanic and postvolcanic symptoms. 4. Explain volcanic materials with examples. 5. Explain the zoning of the dangerous impacts of volcanic eruptions. 6. Explain the impact of volcanic eruptions on life. 7. Explain the types of rescue actions that need to be taken when a volcanic eruption occurs.	Criteria: 1. Individual 2. Group Form of Assessment : Project Results Assessment / Product Assessment	Project - Based Team Learning Presentation 2 x 50	Project - Based Team Learning Presentation 2 x 50	Material: Volcanoes Library: <i>Madlazim. (2015). Seismology Series Earth Physics Book. Surabaya: Unipress UNESA.</i>	5%

10	Able to analyze the occurrence of volcanic disasters.	<ol style="list-style-type: none"> 1.Explain the meaning of volcanic characteristics 2.Explain the background to the causes of volcanic eruptions 3.Explain the types of volcanic eruptions, prevolcanic and postvolcanic symptoms. 4.Explain volcanic materials with examples. 5.Explain the zoning of the dangerous impacts of volcanic eruptions. 6.Explain the impact of volcanic eruptions on life. 7.Explain the types of rescue actions that need to be taken when a volcanic eruption occurs. 	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Individual 2.Group <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	Project - Based Team Learning Presentation 2 x 50	Project - Based Team Learning Presentation 2 x 50	<p>Material: Volcanoes Library: <i>Madlazim. (2015). Seismology Series Earth Physics Book. Surabaya: Unipress UNESA.</i></p>	6%
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11	Able to analyze the occurrence of landslide phenomena and able to understand the dynamics of social disasters.	<ol style="list-style-type: none"> 1.Explain the meaning of landslides which cause landslides. 2.Explaining the zoning of landslide areas using a map. 3.Explain efforts to minimize the danger of landslides. 4.Explains the impact of landslides on life, accompanied by maps, drawings and photos. 5.Explain the meaning of social disaster and the types of social disaster. 6.Explain the factors that cause social disasters. 7.Explain the anticipation of social disasters. 8.Explain the impact of social disasters. 9.Explain strategic efforts to prevent social disasters. 	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Individual 2.Group <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Project - Based Team Learning Presentation 2 x 50	Project - Based Team Learning Presentation 2 x 50	<p>Material: Landslide</p> <p>Literature: <i>Madlazim. (2015). Seismology Series Earth Physics Book. Surabaya: Unipress UNESA.</i></p>	6%
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12	Able to analyze the occurrence of landslide phenomena and able to understand the dynamics of social disasters.	<ol style="list-style-type: none"> 1.Explain the meaning of landslides which cause landslides. 2.Explaining the zoning of landslide areas using a map. 3.Explain efforts to minimize the danger of landslides. 4.Explains the impact of landslides on life, accompanied by maps, drawings and photos. 5.Explain the meaning of social disaster and the types of social disaster. 6.Explain the factors that cause social disasters. 7.Explain the anticipation of social disasters. 8.Explain the impact of social disasters. 9.Explain strategic efforts to prevent social disasters. 	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Individual 2.Group <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Project - Based Team Learning Presentation 2 x 50	Project - Based Team Learning Presentation 2 x 50	<p>Material: Landslide</p> <p>Literature: <i>Madlazim. (2015). Seismology Series Earth Physics Book. Surabaya: Unipress UNESA.</i></p>	6%
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13	Able to understand the concept of disaster-oriented development and able to identify various types of government policies related to disaster management.	<ol style="list-style-type: none"> 1.Explain the scope of development. 2.Explain the goals and nature of development. 3.Explain disaster-based development. 4.Explain the meaning and objectives of national development policy. 5.Explain the types of disaster integration in development plans. 6.Explain examples of disaster-based development policies in Indonesia. 	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Individual 2.Group <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	Project - Based Team Learning Presentation 2 x 50	Project - Based Team Learning Presentation 2 x 50	<p>Material: Disaster Mitigation</p> <p>References: <i>Coburn and Spence. 1994. Disaster Mitigation . United Kingdom: Cambridge Architectural.</i> <i>Agung Mulyo. 2004. Introduction to Earth Science . Bandung: Pustaka Setia. L Don and Leet. 1964. Earthquake; Scientific and Simple Inquiry . Yogyakarta: Discourse Creations. TEAM. 2019. Disaster Learning Guide for Students in Higher Education. Jakarta: Directorate General of Learning and Student Affairs, Ministry of Research, Technology and Higher Education.</i></p>	6%
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14	Able to understand the concept of disaster-oriented development and able to identify various types of government policies related to disaster management.	<ol style="list-style-type: none"> 1.Explain the scope of development. 2.Explain the goals and nature of development. 3.Explain disaster-based development. 4.Explain the meaning and objectives of national development policy. 5.Explain the types of disaster integration in development plans. 6.Explain examples of disaster-based development policies in Indonesia. 	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Individual 2.Group <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	Project - Based Team Learning Presentation 2 x 50	Project - Based Team Learning Presentation 2 x 50	<p>Material: Disaster Mitigation</p> <p>References: <i>Coburn and Spence. 1994. Disaster Mitigation . United Kingdom: Cambridge Architectural.</i> <i>Agung Mulyo. 2004. Introduction to Earth Science . Bandung: Pustaka Setia. L Don and Leet. 1964. Earthquake; Scientific and Simple Inquiry . Yogyakarta: Discourse Creations. TEAM. 2019. Disaster Learning Guide for Students in Higher Education. Jakarta: Directorate General of Learning and Student Affairs, Ministry of Research, Technology and Higher Education.</i></p>	6%
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15	Seminar on the results of developing disaster mitigation posters	Students can create interactive posters for disaster mitigation seminars	Criteria: 1. Individual 2. Group Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	Project - Based Team Learning 2 x 50	Project - Based Team Learning 2 x 50	Material: Disaster Mitigation References: <i>Coburn and Spence. 1994. Disaster Mitigation . United Kingdom: Cambridge Architectural. Agung Mulyo. 2004. Introduction to Earth Science . Bandung: Pustaka Setia. L Don and Leet. 1964. Earthquake; Scientific and Simple Inquiry . Yogyakarta: Discourse Creations. TEAM. 2019. Disaster Learning Guide for Students in Higher Education. Jakarta: Directorate General of Learning and Student Affairs, Ministry of Research, Technology and Higher Education.</i>	15%
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16	Seminar on the results of developing disaster mitigation posters	Students can create interactive posters for disaster mitigation seminars	Criteria: 1. Individual 2. Group Form of Assessment : Project Results Assessment / Product Assessment	Project - Based Team Learning 2 x 50	Project - Based Team Learning 2 x 50	Material: Disaster Mitigation References: <i>Coburn and Spence. 1994. Disaster Mitigation . United Kingdom: Cambridge Architectural. Agung Mulyo. 2004. Introduction to Earth Science . Bandung: Pustaka Setia. L Don and Leet. 1964. Earthquake; Scientific and Simple Inquiry . Yogyakarta: Discourse Creations. TEAM. 2019. Disaster Learning Guide for Students in Higher Education. Jakarta: Directorate General of Learning and Student Affairs, Ministry of Research, Technology and Higher Education.</i>	15%
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Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	21.5%
2.	Project Results Assessment / Product Assessment	58.5%
3.	Test	20%
		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** 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.
- 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.

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.