



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

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight	SEMESTER	Compilation Date																																												
Marine Ecology	4620102048		T=2 P=0 ECTS=3.18	5	July 17, 2024																																												
AUTHORIZATION	SP Developer		Course Cluster Coordinator		Study Program Coordinator																																												
		Dr. H. Sunu Kuntjoro, S.Si., M.Si.																																												
Learning model	Project Based Learning																																																
Program Learning Outcomes (PLO)	PLO study program that is charged to the course																																																
	Program Objectives (PO)																																																
	PLO-PO Matrix																																																
		P.O																																															
Short Course Description	PO Matrix at the end of each learning stage (Sub-PO)																																																
		<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2" style="padding: 5px;">P.O</td> <td colspan="16" style="text-align: center; padding: 5px;">Week</td> </tr> <tr> <td style="padding: 5px;">1</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">3</td> <td style="padding: 5px;">4</td> <td style="padding: 5px;">5</td> <td style="padding: 5px;">6</td> <td style="padding: 5px;">7</td> <td style="padding: 5px;">8</td> <td style="padding: 5px;">9</td> <td style="padding: 5px;">10</td> <td style="padding: 5px;">11</td> <td style="padding: 5px;">12</td> <td style="padding: 5px;">13</td> <td style="padding: 5px;">14</td> <td style="padding: 5px;">15</td> <td style="padding: 5px;">16</td> </tr> </table>																P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16																																	
Short Course Description	The Marine Ecology course studies the scope and development of marine ecology including; characteristics of marine ecosystems, ocean zoning, interactions between biotic and abiotic factors in ocean ecosystems, energy flow and material cycles in marine ecosystems, marine community structure, population dynamics of marine organisms, human interactions with the ocean and problems in the use of marine resources and conservation efforts. The product or output of the marine ecology course is a marine ecology practicum report. Lecture presentations are carried out in the form of theoretical studies, presentations, discussions and practicums in the field and in the laboratory.																																																
References	Main :																																																
	1. Barnes, R.S.K. 2004. <i>An Introduction to Marine Ecology</i> . New York: Blackwell Science Ltd. Castro, P and Huber, M.E. 1987. <i>Marine Biology</i> . Boston: WCB. McGraw-Hill. Purnomo, T. 2019. <i>Ekologi Laut</i> . Jurusan Biologi FMIPA Universitas negeri Surabaya. Romimohtarto, K. dan Sri Juwana. 2005. <i>Biologi Laut</i> . Jakarta: Djambatan. Sumich, J.L.and Dudley, G.H. 1992. <i>Laboratory and Field Investigations in Marine Biology</i> . Fifth Edition. Dubuque: Wm.C.Brown Publisher.																																																
	Supporters:																																																
Supporting lecturer	Dra. Winarsih, M.Kes. Dr. Tarzan Purnomo, 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	Describe the marine environment as an ecological system	<p>1. Explain the physical and chemical properties of sea water</p> <p>2. Explain the process of forming ocean currents and waves</p> <p>3. Explain the geographical and geomorphological conditions of the ocean</p> <p>4. Measure the physical and chemical parameters of sea water</p> <p>Skilled in measuring the physical and chemical parameters of sea water</p>	<p>Criteria:</p> <ol style="list-style-type: none"> 1. Practical reports and products are assessed as ASSIGNMENTS with weight 2. 30% 3. USS weight 20% 4. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 5. US weight 30% 6. Essay questions are assessed together at USS 7. Performance questions are integrated during learning <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	Presentation, and practice 2 X 50			10%
2	Explain the structure & function of marine ecosystems to support life.	<ol style="list-style-type: none"> 1. Identify the organizational structure that makes up marine communities 2. Explain the concept of energy flow and material cycles in marine ecosystems 3. Identify the role of marine organisms in energy flow and material cycles 4. Identify the structure and function of marine ecosystem zoning 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. Practical reports and products are assessed as ASSIGNMENTS with weight 2. 30% 3. USS weight 20% 4. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 5. US weight 30% 6. Essay questions are assessed together at USS 7. Performance questions are integrated during learning 	Presentation and Discussion 2 X 50			0%

3	Describe the characteristics, function & structure of the intertidal zone organism community and their role in supporting life.	1. Explain the characteristics of the intertidal zone 2. Identify the community structure that makes up rocky beaches 3. Identify the community structure that makes up muddy beaches Skilled in applying sampling techniques in coastal ecosystem zoning practices.	Criteria: 1. Practical reports and products are assessed as ASSIGNMENTS with weight 2.30% 3.USS weight 20% 4.Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 5.US weight 30% 6.Essay questions are assessed together at USS 7.Performance questions are integrated during learning Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	Presentation, discussion and practice 2 X 50			10%
4	Explain the characteristics, characteristics and role of subtidal zone organisms in marine ecosystems.	1. Explain the characteristics of the subtidal zone 2. Identify the characteristics of the subtidal zone 3. Identify the community of organisms in the subtidal zone	Criteria: 1. Practical reports and products are assessed as ASSIGNMENTS with weight 2.30% 3.USS weight 20% 4.Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 5.US weight 30% 6.Essay questions are assessed together at USS 7.Performance questions are integrated during learning	Presentation, discussion and reflection 2 X 50			0%
5	Explains the structure, characteristics of the seabed, and adaptation patterns of its organisms.	1. Explain the characteristics of the seabed 2. Identify the structure of the seabed community 3. Identify the types of seabed organisms 4. Explain the adaptation patterns of seabed organisms	Criteria: 1. Practical reports and products are assessed as ASSIGNMENTS with weight 2.30% 3.USS weight 20% 4.Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 5.US weight 30% 6.Essay questions are assessed together at USS 7.Performance questions are integrated during learning	Presentation and discussion 2 X 50			0%

6	Explain the characteristics, nature, diversity & distribution of organisms in estuaries.	1. Explain the characteristics of estuaries 2. Determine the type of estuary based on its characteristics 3. Explain estuaries as typical ecosystems 4. Skilled in measuring physical and chemical parameters in estuary ecosystems 5. Skilled in identifying organisms in estuary ecosystems	Criteria: 1. Practical reports and products are assessed as ASSIGNMENTS with weight 2.30% 3.USS weight 20% 4.Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 5.US weight 30% 6.Essay questions are assessed together at USS 7.Performance questions are integrated during learning Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	Presentation, discussion and Practice 2 X 50			10%
7	Explains the structure of coral reef communities and their interactions with marine ecosystems in a comprehensive manner.	1. Explain the characteristics and role of coral reefs 2. Identify the types of organisms that make up coral reefs 3. Identify types of coral reefs 4. Conduct sampling mapping of coral reef ecosystems 5. Identify types of coral reefs	Criteria: 1. Practical reports and products are assessed as ASSIGNMENTS with weight 2.30% 3.USS weight 20% 4.Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 5.US weight 30% 6.Essay questions are assessed together at USS 7.Performance questions are integrated during learning Form of Assessment : Project Results Assessment / Product Assessment	Presentation, discussion and practice 2 X 50			10%

8	Learning competencies meetings 1-7	In accordance with competency achievement indicators for meetings 1-7	<p>Criteria:</p> <ol style="list-style-type: none"> 1. Practical reports and products are assessed as ASSIGNMENTS with weight 2. 30% 3. USS weight 20% 4. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 5. US weight 30% 6. Essay questions are assessed together at USS 7. Performance questions are integrated during learning <p>Form of Assessment : Test</p>	- 2 X 50			15%
9	Describe the characteristics, function, diversity and role of marine flora for human life.	1. Identify types of marine flora 2. Explain the role and function of marine flora 3. Explain the function of seaweed for humans 4. Skilled in sampling and identifying marine flora	<p>Criteria:</p> <ol style="list-style-type: none"> 1. Practical reports and products are assessed as ASSIGNMENTS with weight 2. 30% 3. USS weight 20% 4. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 5. US weight 30% 6. Essay questions are assessed together at USS 7. Performance questions are integrated during learning <p>Form of Assessment : Assessment of Project Results / Product Assessment, Practices / Performance</p>	Presentation, discussion and Practice 2 X 50			10%
10	Explains communities, interaction patterns, and adaptation patterns of epipelagic organisms in supporting living systems in the ocean.	1. Explain the characteristics of the epipelagic zone 2. Identify the community of organisms in the epipelagic zone 3. Explain the food chain pattern in the epipelagic zone 4. Explain the adaptation pattern of organisms in the epipelagic zone	<p>Criteria:</p> <ol style="list-style-type: none"> 1. Practical reports and products are assessed as ASSIGNMENTS with weight 2. 30% 3. USS weight 20% 4. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 5. US weight 30% 6. Essay questions are assessed together at USS 7. Performance questions are integrated during learning 	Presentation and discussion 2 X 50			0%

11	Explain the diversity of marine invertebrate fauna and their role in marine life systems.	1. Explain the characteristics of marine invertebrate fauna 2. Identify types of sponges 3. Identify types of molluscs 4. Identify types of echinoderms 5. Carry out sampling techniques to identify marine invertebrate diversity	Criteria: 1. Practical reports and products are assessed as ASSIGNMENTS with weight 2.30% 3.USS weight 20% 4.Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 5.US weight 30% 6.Essay questions are assessed together at USS 7.Performance questions are integrated during learning Form of Assessment : Project Results Assessment / Product Assessment	Presentation, discussion and practice 2 X 50			10%
12	Explain the characteristics and adaptation patterns of deep sea zone organisms.	1. Explain the characteristics of the deep sea zone 2. Identify the types of deep sea zone organisms 3. Explain the adaptation patterns of deep sea zone organisms	Criteria: 1. Practical reports and products are assessed as ASSIGNMENTS with weight 2.30% 3.USS weight 20% 4.Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 5.US weight 30% 6.Essay questions are assessed together at USS 7.Performance questions are integrated during learning	Presentation, discussion and reflection 2 X 50			0%
13	Explain the diversity and potential of marine fisheries for human welfare.	1. Explain marine fish communities in Indonesia and their role in human life 2. Identify the characteristics of marine fish 3. Group marine fish based on their types 4. Explain the potential of marine fisheries 5. Identify marine problems 6. Skilled in identifying types of marine fish	Criteria: 1. Practical reports and products are assessed as ASSIGNMENTS with weight 2.30% 3.USS weight 20% 4.Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 5.US weight 30% 6.Essay questions are assessed together at USS 7.Performance questions are integrated during learning Form of Assessment : Assessment of Project Results / Product Assessment, Practices / Performance	Presentation, discussion and practice 2 X 50			10%

14	Explain the diversity of marine vertebrate fauna and their role in living systems in the ocean.	1. Explain the types and roles of reptiles, birds and marine mammals in marine ecosystems 2. Identify types of marine reptiles 3. Identify types of sea birds 4. Identify types of marine mammals	Criteria: 1. Practical reports and products are assessed as ASSIGNMENTS with weight 2.30% 3.USS weight 20% 4.Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 5.US weight 30% 6.Essay questions are assessed together at USS 7.Performance questions are integrated during learning	Presentation and discussion 2 X 50			0%
15	Explain the influence of human activity in the use of marine resources and its impact on the sustainability of the marine ecological system and how to prevent it.	1. Explain the benefits of the ocean and human influence on the ocean 2. Identify types of marine resources that are beneficial for human welfare 3. Explain the characteristics of marine resources 4. Explain the impact of human activities on the ocean 5. Put forward ideas for preserving marine ecosystems	Criteria: 1. Practical reports and products are assessed as ASSIGNMENTS with weight 2.30% 3.USS weight 20% 4.Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 5.US weight 30% 6.Essay questions are assessed together at USS 7.Performance questions are integrated during learning	Presentation, analysis and discussion 2 X 50			0%
16			Form of Assessment : Project Results Assessment / Product Assessment, Test	UAS 2 x 50			15%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	15%
2.	Project Results Assessment / Product Assessment	52.5%
3.	Practice / Performance	10%
4.	Test	22.5%
		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** 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.

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.