	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
Planktonology	4620102153		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

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

Short Course Description	This course contains terminology, characteristics and classification of plankton and aquatic primary producers and discusses their behavior, role and ecological relationships in aquatic ecosystems, as well as their benefits for humans; Several Environmental Index formulas are introduced to train skills in assessing the condition of waters.
References	**Main :**

1.

1. Borowitzka, M.A. & Borowitzka L.J. 1988. *Micro-algal Biotechnology* . Cambridge University Press. Melbourne. 477 p.
2. Belcher, H dan E. Swale. 1979. An ilustrated Guide of River Phytoplankton. Crown Copy Right. London. 64 p.
3. Davis, C.C. 1955. The Marine and Freshwater Plankton. Michigan State University Press.
4. Edmonson, W.T. 1963. Freshwater Biology. John Wiley and Sons, Inc. Seattle.
5. Fritsch, F.E. 1959. The Structure and Reproduction of the algae. Cambridge University Press.
6. Goldman, C.R. 1985. Primary Productivity in Aquatic Environments.
7. Harris, G.P. 1986. Phytoplankton Ecology: Structure, Function, and Fluctuation. Chapman and Hall. .
8. Legendre, L. dan P. Legendre. 1983. *Numerical Ecology.* Elsevier Scientific Publ. Co. Amsterdam, Oxford. 428 p.
9. Mizuno, T. 1979 . *Illustration of The Freshwater Plankton of Japan.* Hokusha Publishing Co. Ltd. Japan. 313 p.

	Supporters:
Supporting lecturer	Dr. Tarzan Purnomo, M.Si. Dr. H. Sunu Kuntjoro, 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	Explain the scope of Planktonology.	1. Explain the scope of planktonology. 2. Explain the important role of plankton in human life	**Criteria:** 1.TASK with weights 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 jointly on USS and US	Presentation, discussion 2 X 50			0%
2	Explain the characteristics of the aquatic environment	1. Explain the characteristics of freshwater environments. 2. Explain the characteristics of brackish water environments. 3. Explain the characteristics of the marine environment.	**Criteria:** 1.TASK with weights 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 jointly on USS and US	Presentation, Discussion 2 X 50			0%
3	Describe the types of plankton adaptations.	1. Explain the various types of adaptations that plankton make for their existence. 2. Explain the mechanism of adaptation to buoyancy 3. Explain the mechanism of adaptation for self-defense against predators 4. Explain the mechanism of adaptation to the movement of water masses 5. Explain the mechanism of adaptation to unfavorable environmental conditions	**Criteria:** 1.TASK with weights 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 jointly on USS and US	Presentation, discussion 2 X 50			0%

4	Identifying the Characteristics and Classification of Phytoplankton.	1. Explain the characteristics of phytoplankton. 2. Explain the classification of phytoplankton	**Criteria:** 1.TASK with weights 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 jointly on USS and US	Presentation and discussion 2 X 50			0%
5	Explain the characteristics and classification of Zooplankton	1. Explain the characteristics of zooplankton. 2. Explain the classification of zooplankton	**Criteria:** 1.TASK with weights 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 jointly on USS and US	Presentation, discussion 2 X 50			0%
6	Explain water parameters that influence plankton growth.	1. Explain the effect of light on plankton growth 2. Explain the effect of chlorophyll on plankton growth 3. Explain the effect of water transparency on plankton growth	**Criteria:** 1.TASK with weights 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 jointly on USS and US	Presentation and discussion 2 X 50			0%

7	Explain water parameters that influence plankton growth.	1. Explain the effect of temperature on plankton growth 2. Explain the effect of salinity on plankton growth 3. Explain the effect of nutrients on plankton growth	**Criteria:** 1.TASK with weights 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 jointly on USS and US	Presentation and discussion 2 X 50			0%
8	Confluence indicators 1-7	meeting indicators 1-7	**Criteria:** 1.TASK with weights 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 jointly on USS and US	- 2 X 50			0%
9	Explaining freshwater plankton communities	1. Explain the types and roles of freshwater phytoplankton 2. Explain the types and roles of freshwater zooplankton	**Criteria:** 1.TASK with weights 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 jointly on USS and US	Presentation and discussion 2 X 50			0%

10	Explaining the brackish water plankton community	1. Explain the types and roles of brackish water phytoplankton 2. Explain the types and roles of brackish water zooplankton	**Criteria:** 1.TASK with weights 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 jointly on USS and US	Presentation and discussion 2 X 50			0%
11	Explaining the seawater plankton community	1. Explain the types and roles of seawater phytoplankton 2. Explain the types and roles of seawater zooplankton	**Criteria:** 1.TASK with weights 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 jointly on USS and US	Presentation and discussion 2 X 50			0%
12	Explain the economic value of phytoplankton	1. Explain the types of diatoms that have economic value 2. Explain the types of algae that have economic value	**Criteria:** 1.TASK with weights 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 jointly on USS and US	Presentation and discussion 2 X 50			0%

13	Explaining Zooplankton which has economic value	1. Explain the types of Rotifera that have economic value. 2. Explain the types of Arthropods that have economic value	**Criteria:** 1.TASK with weights 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 jointly on USS and US	Presentation and discussion 2 X 50			0%
14	Explain the procedure for measuring plankton populations	1. Explain the procedures for collecting plankton. 2. Practicing plankton sample preservation 3. Practicing plankton identification 4. Practicing plankton accumulation 5. Practicing plankton counting	**Criteria:** 1.TASK with weights 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 jointly on USS and US	Presentation, discussion and Practice 2 X 50			0%
15	Carrying out plankton culture	1. Explain the procedures for culturing phytoplankton and zooplankton 2. Skilled in culturing phytoplankton and zooplankton	**Criteria:** 1.TASK with weights 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 jointly on USS and US	Presentation, discussion and Practice 2 X 50			0%
16							0%

Evaluation Percentage Recap: Project Based Learning

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** 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.