



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																																	
Limnology*	4620102112	Study Program Elective Courses	T=2 P=0 ECTS=3.18	5	July 17, 2024																																	
AUTHORIZATION	SP Developer		Course Cluster Coordinator	Study Program Coordinator																																		
	Dr. Sunu Kuntjoro, M.Si.		Prof. Dr. Fida Rachmadiarti, M.Kes.	Dr. H. Sunu Kuntjoro, S.Si., M.Si.																																		
Learning model	Case Studies																																					
Program Learning Outcomes (PLO)	PLO study program that is charged to the course																																					
	PLO-5	Able to communicate scientific ideas, both orally and in writing using appropriate communication media according to the target, as a means of lifelong learning for academic self-development.																																				
	PLO-9	Able to work independently in the laboratory and develop relevant skills by applying bioethics and work safety																																				
	PLO-13	Able to demonstrate basic knowledge of cell and molecular biology, organismal biology, ecology and evolution to analyze current biological issues																																				
	Program Objectives (PO)																																					
	PLO-PO Matrix																																					
		<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 20%;">P.O</td> <td style="width: 20%;">PLO-5</td> <td style="width: 20%;">PLO-9</td> <td style="width: 20%;">PLO-13</td> <td style="width: 20%;"></td> </tr> </table>					P.O	PLO-5	PLO-9	PLO-13																												
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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="width: 5%;">P.O</td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 5%;">1</td> <td style="width: 5%;">2</td> <td style="width: 5%;">3</td> <td style="width: 5%;">4</td> <td style="width: 5%;">5</td> <td style="width: 5%;">6</td> <td style="width: 5%;">7</td> <td style="width: 5%;">8</td> <td style="width: 5%;">9</td> <td style="width: 5%;">10</td> <td style="width: 5%;">11</td> <td style="width: 5%;">12</td> <td style="width: 5%;">13</td> <td style="width: 5%;">14</td> <td style="width: 5%;">15</td> <td style="width: 5%;">16</td> </tr> </table>					P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16																						
Short Course Description	Limnology is a branch of ecology that studies the properties and structure of land waters. As a branch of ecology, the object studied in limnology is the unity of life that exists in the ecosystem. Limnology is a branch of science that studies the nature and structure of land waters which include springs, rivers, lakes, ponds and swamps; both fresh water and brackish water. Limnology is a branch of ecological science that specifically studies water systems on the surface of the earth. Water quality, namely the properties of water and the content of living things, substances, energy or other components in the water. Water quality is expressed by several parameters, namely physical parameters (temperature, turbidity, dissolved solids, etc.) and biological parameters (presence of plankton, bacteria and so on).																																					
References	Main :																																					
	<ol style="list-style-type: none"> 1. 1. Textbook of Limnology, Fifth Edition 5th Edition by Gerald A. Cole (Author), Paul E. Weihe 2. 2. Kalf, J. 2002. Limnologi. New York: Prentice Hall 3. 3. Michael, P. 1984. Ecological method for Field and Laboratory Investigations. New Delhi: Tata McGraw-Hill Publishing Company Limited. 4. 4. Payne, A.I. 1986. The Ecology of Tropical Lake & River. Chicester-New York-Toronto-Brisbane. Singapura : John Wiley and Sons. 5. 5. Suwono, Hadi. 2012. Dasar-dasar Limnologi. Malang: Putra Media Nusantara 6. 6. Wetzel, R.G. 1998. Limnologi. Philadelphia: W.B. Saunders Company. 																																					
	Supporters:																																					
Supporting lecturer	Prof. Dr. Fida Rachmadiarti, M.Kes. 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	Understanding the development of limnology	· Explain the history of the development of limnology · Identify the position of limnology in ecological science · Explain the scope of Limnology	Criteria: Attached Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	Presentation, discussion Practical work 2 X 50		Material: Introduction (Scope of Ecology) Bibliography: 1. <i>Textbook of Limnology, Fifth Edition</i> by Gerald A. Cole (Author), Paul E. Weihe	5%
2	Understand the function and management of fresh water	Explain the function and availability of fresh water. Fresh water storage. Fresh water management	Criteria: Attached Form of Assessment : Participatory Activities	Presentation and discussion 2 X 50		Material: Function and availability of fresh water References: 2. Kalf, J. 2002. <i>Limnology</i> . New York: Prentice Hall	5%
3	Understanding water as an environment	Explain the properties of water. Explain the vertical stratification of temperature, oxygen, seasonal cycles	Criteria: Attached Form of Assessment : Participatory Activities	Presentation, discussion 2 X 50		Material: Physical and chemical properties of water References: 1. <i>Textbook of Limnology, Fifth Edition</i> by Gerald A. Cole (Author), Paul E. Weihe	5%
4	Understanding water as an environment	Explain lighting in water. Explain the movement of water	Criteria: Attached Form of Assessment : Participatory Activities	Presentation, discussion 2 X 50			5%
5	Understanding the diversity of aquatic biota (phytoplankton)	Explain the characteristics of phytoplankton. Explain the relationship between phytoplankton and the environment	Criteria: Attached Form of Assessment : Participatory Activities	Presentation, discussion 2 X 50		Material: Characteristics of Plankton References: 2. Kalf, J. 2002. <i>Limnology</i> . New York: Prentice Hall	3%
6	Understanding zooplankton	Explain the characteristics of zoo plankton, explain the taxonomy of zooplankton, explain the behavior of zooplankton	Criteria: Attached Form of Assessment : Participatory Activities	Presentation, discussion 2 X 50			5%
7	Understanding the diversity of aquatic biota (macrophytes)	Explain the function of aquatic macrophytes Explain the problems and management of aquatic macrophytes Identify the types of macrophytes Explain the function of aquatic macrophytes Explain the problems and management of aquatic macrophytes	Criteria: Attached Form of Assessment : Participatory Activities	Presentation, discussion 2 X 50			5%

8	UTS	UTS	Criteria: UTS Form of Assessment : Test	UTS 2 X 50			20%
9	Understand the zoning formed in aquatic ecosystems	· Identifying the distribution of water on Earth · Explaining the structure of inland water ecosystems · Identifying the primary zones of aquatic ecosystems	Criteria: Attached Form of Assessment : Participatory Activities	Presentation, Discussion and reflection 2 X 50			5%
10	Understanding the Use of Inland Aquatic Ecosystems	Explain the benefits of inland water ecosystems. Identify water quality criteria	Criteria: Attached Form of Assessment : Participatory Activities	Presentation, discussion 2 X 50			0%
11	Understand the physical and chemical factors of waters that play an important role and can be limiting factors for the life of organisms in waters	· Explain the physical factors of waters · Explain the chemical factors of waters	Criteria: Attached Form of Assessment : Participatory Activities	Presentation and discussion 2 X 50			3%
12	Understand the relationship between physical and chemical factors in waters. Skilled in determining water quality based on physical and chemical indicators of waters	Explain the relationship between physical and chemical factors in waters. Skilled in determining water quality based on physical and chemical indicators of waters	Criteria: Attached Form of Assessment : Participatory Activities, Portfolio Assessment	Practice, Presentation and discussion 4 X 50			0%
13	Understand the types of lentic ecosystems	· Identify types of lentic waters	Criteria: Attached Form of Assessment : Participatory Activities, Portfolio Assessment	Presentation and discussion 2 X 50			5%
14	Understand the trophic status of water bodies	Identify signs of eutrophication Explain the factors that influence the level of eutrophication Explain the impacts of eutrophication	Criteria: attached Form of Assessment : Participatory Activities	Presentation and discussion 2 X 50			5%
15	Understanding estuaries Understanding the diversity of estuary biota	· explain the meaning of estuary · explain the physical properties of estuaries · explain the characteristics of estuary biota · explain the types of estuary bits · explain the behavior of estuary biota	Criteria: Attached Form of Assessment : Participatory Activities, Portfolio Assessment	Presentation and discussion 2 X 50			9%
16			Form of Assessment : Test				20%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
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1.	Participatory Activities	50.5%
2.	Project Results Assessment / Product Assessment	2.5%
3.	Portfolio Assessment	7%
4.	Test	40%
		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.