| | | | | | Document Code |
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| | **Universitas Negeri Surabaya**<br>**Faculty of Mathematics and Natural Sciences**<br>**Biology Education Undergraduate Study Program** | | | | |

## SEMESTER LEARNING PLAN

| Courses | | CODE | Course Family | Credit Weight | | | SEMESTER | Compilation Date |
|---|---|---|---|---|---|---|---|---|
| Aquatic Biology | | 8420502051 | | **T=2** | **P=0** | **ECTS=3.18** | 7 | July 18, 2024 |

| AUTHORIZATION | SP Developer | Course Cluster Coordinator | Study Program Coordinator |
|---|---|---|---|
| | ...................................... | ...................................... | Dr. Rinie Pratiwi Puspitawati, M.Si. |

| Learning model | Case Studies |
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| Program Learning Outcomes (PLO) | **PLO study program which is charged to the course** |
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| | **Program Objectives (PO)** |
| | **PLO-PO Matrix** |
| | P.O |
| | **PO Matrix at the end of each learning stage (Sub-PO)** |
| | P.O Week |

| P.O | Week | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

| Short Course Description | Study the characteristics of aquatic ecosystems and their influence on aquatic organisms, economic potential, development prospects and threats to their sustainability in order to find alternative solutions to overcome problems and conservation efforts. Lectures are presented in theoretical and practical form. |
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| References | **Main :** |
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1. 1. Campbell, Neil A, Jane B.Reece dan Lawrence G.Mitchell. 2003. Biologi . California: Benjamin Cummings.
2. 2. Castro, P and Huber, M.E. 1987. Marine Biology . WCB. McGraw-Hill. Boston.
3. 3. Purnomo, T. 2012. Hand out Ekologi Laut. Jurusan Biologi FMIPA Unesa.
4. 4. Romimohtarto, K. dan Sri Juwana. 2005. Biologi Laut. Jakarta: Djambatan.
5. 5. Fuad Cholik et al ., 2005. AKUAKULTUR tumpuan harapan masa depan bangsa. Jakarta: Masyarakat Perikanan Nusantara (MPN) dan Taman Akuarium Air Tawar TMII.

| | **Supporters:** |
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| Supporting lecturer | Prof. Dr. Fida Rachmadiarti, M.Kes.<br>Dr. Tarzan Purnomo, M.Si. |
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| 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) |

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| 1 | Describe the marine environment as an ecological system | 1. Explain the physical and chemical properties of sea water 2. Explain the process of forming ocean currents and waves 3. Explain the geographical and geomorphological conditions of the ocean 4. Measure the physical and chemical parameters of sea water Skilled in measuring the physical and chemical parameters of sea water | | Presentation, and practice 2 X 50 | | | 0% |
| 2 | Explain the structure & function of marine ecosystems as life support. | 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 the energy flow and material cycle. Identify the structure and function of marine ecosystem zoning | | Presentation and Discussion 2 X 50 | | | 0% |
| 3 | Explain the characteristics, properties, 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 Skilled in identifying organisms in estuary ecosystems | | Presentation, discussion and Practice 2 X 50 | | | 0% |
| 4 | 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 Skilled in sampling and identifying marine flora | | Presentation, discussion and Practice 2 X 50 | | | 0% |
| 5 | 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 Identify types of coral reefs | | Presentation, discussion and practice 2 X 50 | | | 0% |

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| 6 | 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 Skilled in identifying types of marine fish | | Presentation, discussion and practice 2 X 50 | | | 0% |
| 7 | 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 Explain the adaptation patterns of seabed organisms | | Presentation and discussion 2 X 50 | | | 0% |
| 8 | Giving Subsummative written test-1 | - | | - 2 X 50 | | | 0% |
| 9 | Understanding water as an environment | · Explain the properties of water. Explain the vertical stratification of temperature, oxygen, seasonal cycles | | Presentation, discussion 2 X 50 | | | 0% |
| 10 | Understanding the diversity of aquatic biota (phytoplankton) | Explain the characteristics of phytoplankton. Explain the relationship between phytoplankton and the environment | | Presentation, discussion 2 X 50 | | | 0% |
| 11 | Understanding zooplankton | Explain the characteristics of zoo plankton, explain the taxonomy of zooplankton, explain the behavior of zooplanton | | Presentation, discussion 2 X 50 | | | 0% |
| 12 | Understanding the diversity of aquatic biota (macrophytes) | Identify types of macrophytes. Explain the function of aquatic macrophytes. Explain problems and management of aquatic macrophytes | | Presentation, discussion 2 X 50 | | | 0% |
| 13 | Understand the types of lentic ecosystems | 1. Identify the types of lentic waters | | Presentation and discussion 2 X 50 | | | 0% |
| 14 | Understand the trophic status of water bodies | 1. Identify signs of eutrophication 2. Explain the factors that influence the level of eutrophication Explain the impact of eutrophication | | Presentation and discussion 2 X 50 | | | 0% |

| 15 | Explain the influence of human activity in the use of aquatic resources and its impact on sustainability and how to prevent it. | 1. Explain the benefits of waters and human influence 2. Identify types of aquatic resources that are beneficial for human welfare 3. Explain the characteristics of aquatic resources 4. Explain the impact of human activities on waters Put forward ideas for preserving aquatic ecosystems | | Presentation and discussion 2 X 50 | | | 0% |
|---|---|---|---|---|---|---|---|
| 16 | | | | | | | 0% |

<u>**Evaluation Percentage Recap**</u>**: 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** 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.