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

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Applied Microbiology	8420502166		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	**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 examines the application of microbiology concepts in various fields including health, food, industry, animal husbandry, agriculture, the environment and biological control. This course is presented in theoretical and practical form.
References	**Main :**

1. (1) Budiyanto, M. A. K. 2002. Mikrobiologi Terapan . Malang: Universitas Muhammadiyah Malang. (2) Madigan, M.T., J.M. Martinko, D.A. Stahl, dan D.P. Clark. 2012. Biology of Microorganism . Boston: Pearson. (3) Tortora, G. J., B. R. Funke, dan C. L. Case. 2007. Microbiology An Introduction . San Fransisco: Addison Wesley Longman, Inc. (4) Asri, M. T., dan G. Trimulyono. 2011. Petunjuk Praktikum Mikrobiologi Dasar dan Terapan . Surabaya: University Press Unesa.

Supporters:	
Supporting lecturer	MUSLIMIN IBRAHIM Prof. Dr. Mahanani Tri Asri, M.Si. Guntur Trimulyono, S.Si., M.Sc. Dr. Pramita Yakub, S.Pd., M.Pd.

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	Understand the scope of applied microbiology	Explain the scope of applied microbiology	**Criteria:** 1. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 2. USS weight 20% 3. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 4. US weight 30% 5. Essay questions are assessed together at USS 6. Multiple choice questions are assessed jointly on the US 7. Performance questions are integrated during learning	Presentation, discussion 2 X 50			0%
2	Understand the concept of microbiology in the health sector	1. Explain the concept of health microbiology 2. Explain the history of the development of microbiology in the health sector 3. Skilled in applying the principles of microbiology in the health sector	**Criteria:** 1. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 2. USS weight 20% 3. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 4. US weight 30% 5. Essay questions are assessed together at USS 6. Multiple choice questions are assessed jointly on the US 7. Performance questions are integrated during learning	Presentation, discussion and reflection Practical work 2 X 50			0%

3	Understand the role of microorganisms in the medical field that are often encountered in everyday life	1. Identifying the role of microbes in the health sector 2. Explain examples of microbes that play a role in the health sector 3. Explain the principles of microbial control in the health sector 4. Skilled in testing antimicrobial activity	**Criteria:** 1. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 2. USS weight 20% 3. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 4. US weight 30% 5. Essay questions are assessed together at USS 6. Multiple choice questions are assessed jointly on the US 7. Performance questions are integrated during learning	Presentation, discussion and reflection Practical work 2 X 50			0%
4	Understand the concept of microbiology in the food sector.	Explain the concept of food microbiology. Explain the history of the development of microbiology in the food sector	**Criteria:** 1. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 2. USS weight 20% 3. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 4. US weight 30% 5. Essay questions are assessed together at USS 6. Multiple choice questions are assessed jointly on the US 7. Performance questions are integrated during learning	Presentation, discussion Practical work discussion, 2 X 50			0%

5	Understand the role of bacteria, fungi and bacteria in food processing	1. Identifying the role of microbes in food processing 2. Explain examples of food products produced by microbes 3. Explain the principles of food preservation	**Criteria:** 1. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 2. USS weight 20% 3. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 4. US weight 30% 5. Essay questions are assessed together at USS 6. Multiple choice questions are assessed jointly on the US 7. Performance questions are integrated during learning	Presentation, discussion Practical work 2 X 50			0%
6	Understand the concept of microbiology in the industrial field.	1. Explain the concept of food microbiology 2. Explain the history of the development of microbiology in the industrial sector 3. Skilled in applying microbiology principles in the industrial field	**Criteria:** 1. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 2. USS weight 20% 3. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 4. US weight 30% 5. Essay questions are assessed together at USS 6. Multiple choice questions are assessed jointly on the US 7. Performance questions are integrated during learning	Presentation, discussion and reflection Practical work 2 X 50			0%

7	Understand the role of microorganisms in the industrial sector that are often encountered in everyday life	· Identify the role of microbes in the industrial sector · Explain examples of industrial products produced by microbes · Explain the principles of using microbes in the industrial sector Skilled in producing industrial commodities with the help of microbes	**Criteria:** 1. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 2. USS weight 20% 3. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 4. US weight 30% 5. Essay questions are assessed jointly on USS. Multiple choice questions are assessed jointly on US 6. Performance questions are integrated during learning	Presentation, discussion and reflection Practical work 2 X 50			0%
8			**Criteria:** USS weight 20%	2 X 50			0%
9	Understand the concept of microbiology in the environmental field	Explain the concept of environmental microbiology. Explain the history of the development of microbiology in the environmental field	**Criteria:** 1. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 2. USS weight 20% 3. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 4. US weight 30% 5. Essay questions are assessed together at USS 6. Multiple choice questions are assessed jointly on the US 7. Performance questions are integrated during learning	Presentation, discussion and reflection 2 X 50			0%

10	Understand the role of microorganisms in the environmental sector that are often encountered in everyday life.	1. Identifying the role of microbes in the environmental field 2. ·Explain examples of microbes that play a role in the environmental field 3. Explain the principles of microbial use in the environmental sector	**Criteria:** 1. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 2. USS weight 20% 3. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 4. US weight 30% 5. Essay questions are assessed together at USS 6. Multiple choice questions are assessed jointly on the US 7. Performance questions are integrated during learning	Presentation, discussion and reflection 2 X 50			0%
11	Communicate understanding of concepts about microbiology in agriculture	Explain the concept of microbiology in the agricultural sector. Explain the history of the development of microbiology in the agricultural sector	**Criteria:** 1. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 2. USS weight 20% 3. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 4. US weight 30% 5. Essay questions are assessed together at USS 6. Multiple choice questions are assessed jointly on the US 7. Performance questions are integrated during learning	Presentation, discussion and reflection 2 X 50			0%

12	Understand the role of bacteria, fungi and viruses in agriculture	1. Identify the role of microbes in agriculture 2. Explain examples of microbes that play a role in agriculture 3. Explain the principles of using microbes in agriculture	**Criteria:** 1. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 2. USS weight 20% 3. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 4. US weight 30% 5. Essay questions are assessed together at USS 6. Multiple choice questions are assessed jointly on the US 7. Performance questions are integrated during learning	Presentation, discussion and reflection Practical work 2 X 50			0%
13	Understand the concept of microbiology in the field of animal husbandry	Explain the concept of microbiology in the field of animal husbandry. Explain the history of the development of microbiology in the field of animal husbandry	**Criteria:** 1. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 2. USS weight 20% 3. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 4. US weight 30% 5. Essay questions are assessed together at USS 6. Multiple choice questions are assessed jointly on the US 7. Performance questions are integrated during learning	Presentation, discussion and reflection 2 X 50			0%

14	Understand the role of bacteria, fungi and viruses in the field of animal husbandry	1. Identifying the role of microbes in animal husbandry 2. Explain examples of microbes that play a role in animal husbandry 3. Explain the principles of using microbes in animal husbandry	**Criteria:** 1. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 2. USS weight 20% 3. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 4. US weight 30% 5. Essay questions are assessed together at USS 6. Multiple choice questions are assessed jointly on the US 7. Performance questions are integrated during learning	Presentation, discussion and reflection 2 X 50			0%
15	Communicate an understanding of the concept of microbiology in biological control, the role of bacteria, fungi and viruses in biological control	1. Identifying the role of microbes for biological control 2. Explain examples of microbes that play a role in biological control 3. Explain the principles of using microbes for biological control	**Criteria:** 1. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 2. USS weight 20% 3. Students' activities and responses during learning activities, especially practicums, are assessed as participation, with a weight of 20% 4. US weight 30% 5. Essay questions are assessed together at USS 6. Multiple choice questions are assessed jointly on the US 7. Performance questions are integrated during learning	Presentation, discussion and reflection 2 X 50			0%
16			**Criteria:** US weight 30%	2 X 50			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.