	Universitas Negeri Surabaya **Faculty of Engineering** **, Undergraduate Culinary Education Study Program**	**Document Code**

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Food Microbiology*)	8321102039		**T=2**	**P=0**	**ECTS=3.18**	8	July 18, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	Dr. Hj. Sri Handajani, S.Pd., M.Kes.

Learning model	**Case Studies**
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	Study and understanding of the principles of microorganisms, metabolism of microorganisms, growth of microorganisms, growth factors of microorganisms, microorganisms in food production, microorganisms that cause food spoilage, microorganisms that cause poisoning, and microorganisms that cause infection. Learning is carried out with a constructivist approach. The lesson ended by making a report analyzing the factors causing cases of food spoilage and food poisoning by each student in a group discussion.
References	**Main :**

1. Tatang, S.W. 2014. Mikrobiologi Pangan (Teori dan Praktek) . Yogyakarta: Andi
2. Supardi, I dan Sukamto. 1999. Mikrobiologi Dalam Pengolahan Pangan dan Keamanan Pangan . Bandung: Alumni
3. Jay, J.M. 1978. Modern Food Microbiology (Second Edition) . Van Norstrand Reinhold Co. New York. USA
4. Pratiwi. Sylvia T. 2008. Mikrobiologi Farmasi . Jakarta: Erlangga

Supporters:	
Supporting lecturer	Dra. Hj. Siti Sulandjari, M.Si. Dr. Ir. Asrul Bahar, M.Pd. Dr. Hj. Sri Handajani, S.Pd., M.Kes.

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 description of Food Microbiology and the importance of Food Microbiology	1. Explain the description of Food Microbiology, lecture achievements, scope 2. Explain the importance of understanding Food Microbiology	**Criteria:** Students are declared to understand if they explain as in the RPS	Method: Lecture, discussion and question and answer 2 X 50			0%

2	Mastering the principles of microbiology	1. Explain the discovery of the world of microorganisms 2. Explain the discovery of the role of microorganisms in changing the form of organic materials 3. Explain the discovery of the role of microorganisms as causes of disease 4. Explain the classification of microorganisms 5. Explain the morphology and structure of bacterial cells 6. Explain the morphology and structure of mold cells 7. Explain the morphology and structure of kamir cells	**Criteria:** Scores are given based on the suitability of the answer to the answer key	Cooperative model Method: Discussion, assignment 4 X 50			0%
3							0%
4	Students understand the properties of microorganisms	1. Compare the characteristics of each group of bacteria2. Compare the characteristics of each group 3. Compare the characteristics of each group of molds	**Criteria:** Scores are given based on the suitability of the answer to the answer key	Approach: Scientific Model: Cooperative Method: Discussion, question and answer, 2 X 50 assignments			0%
5	Students understand the metabolism of microorganisms	1. Explain the sources of nutrients for microbial growth 2. Compare aerobic respiration, anaerobic respiration and food fermentation 3. Analyzing the role of protein metabolism during microbial growth	**Criteria:** Scores are given based on the suitability of the answer to the answer key	Approach: Scientific Model: Cooperative Method: Discussion, question and answer, 2 X 50 assignments			0%
6	Students master the growth of microorganisms	1. Compare the phases of the growth curve of microorganisms2. Analyze the factors that influence growth	**Criteria:** Scores are given based on the suitability of the answer to the answer key	Approach: constructivist Model: Cooperative Method: Discussion, question and answer, Assignment 2 X 50			0%
7	Students understand the identification of factors that influence the growth of microorganisms	1. Identify the effect of nutrients on microbial growth2. Identify the effect of temperature on the growth of microorganisms3. Identifying the effect of preservatives on microbial growth4 Identifying the effect of water activity (Aw) on the growth of microorganisms5. Identify the effect of oxygen on microbial growth	**Criteria:** 1. Scores are given based on the suitability of the answer to the answer key 2. Each correct answer according to the answer key gets a score of 20	Approach: Scientific Model: Cooperative Method: Discussion, question and answer and 2 X 50 assignments			0%
8	UTS			2 X 50			0%

9	Students understand microbiological damage in storing plant foods	1. Identify types of destructive microorganisms 2. Analyzing damage to vegetables by microorganisms 3. Analyzing fruit damage by microorganisms 4. Analyzing damage to grains by microorganisms 5. Analyzing damage to tubers by microorganisms	**Criteria:** Scores are given based on the suitability of the answer to the answer key. Each item answered according to the answer key is given a score of 20	Approach: Scientific Model: Inquiry Method: Observation, Discussion, Assignment 2 X 50			0%
10	Students understand microbiological damage in storing animal foods	1. Identify the types of microbes that destroy animal food2. Analyzing meat damage by microbes3. Analyzing fish damage by microbes 4. Analyzing milk damage by microbes 5. Analyzing egg damage by microbes	**Criteria:** Scores are given based on the suitability of the answer to the answer key. Each question answered according to the answer key gets a score of 20	Approach: Scientific Model: Inquiry Method: Observation, Discussion, Assignment 2 X 50			0%
11	Students understand the prevention of microbiological damage to food	1. Describe the regulation of physical conditions to prevent food damage2. Select chemical compounds to prevent food damage by 3. Determine radiation techniques to prevent food damage by microbes	**Criteria:** 1.All questions if answered according to the answer key are given a full score of 100 2.Assignment reports are awarded according to their accuracy, completeness and quality of workmanship	Approach: Scientific Model: Cooperative Method: Discussion, Assignment 2 X 50			0%
12	Students understand the role of microorganisms in fermentation of vegetable ingredients	1. Explain tape fermentation2. Explain the fermentation of pickles3. Fermentation of Nata de Coco4. Explain tempeh fermentation 5. Explain soy sauce fermentation6. Explain Tauco fermentation7. Explain Beer fermentation8. Explain Pickle fermentation9. Explain vinegar fermentation	**Criteria:** Scores are given based on the suitability of the answer to the answer key. Each question answered according to the answer key gets a score of 10	Approach: Scientific Model: Cooperative Method: Discussion and Assignment 2 X 50			0%
13	Students understand microorganisms in animal-based fermentation	1. Explain yoghurt fermentation2. Explain kefir fermentation 3. Explain shrimp paste fermentation 4. Explain cheese fermentation 5. Explain the fermentation of peda fish 6. Explain sausage fermentation	**Criteria:** Scores are given based on the suitability of the answer to the answer key. Each question answered according to the answer key is given a score of 15	Approach: Scientific Model: Cooperative Method: Discussion, Assignment 2 X 50			0%
14	Students understand how to calculate the growth of microorganisms	1. Identify the differences in various types of growing media2. Counting the number of microbes from a medium using the Total Plate Count3 method. Calculating microbial growth using the MPN method	**Criteria:** Scores are given based on the suitability of the answer to the answer key. The answer to item 1 corresponds to the answer key with a score of 40, item 2 with a score of 30, and item 3 with a score of 30	Approach: Constructivist Model: Cooperative Method: Discussion< Assignment 2 X 50			0%

15	Students master pathogenic microorganisms	1. Identify microbial intoxication through food2. Identifying foodborne infections	**Criteria:** 1. If each item is answered according to the answer key, a score of 50 is given 2. Assignment reports are valued based on timeliness, completeness and quality of work	Approach: Constructivist Model: Cooperative Method: Discussion, question and answer and 2 X 50 assignments			0%
16							0%

Evaluation Percentage Recap: 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.