



**Universitas Negeri Surabaya**  
**Faculty of Mathematics and Natural Sciences**  
**Biology Undergraduate Study Program**

Document Code

**SEMESTER LEARNING PLAN**

<b>Courses</b>	<b>CODE</b>	<b>Course Family</b>	<b>Credit Weight</b>	<b>SEMESTER</b>	<b>Compilation Date</b>																																										
Food Biology*	4620102029		T=2 P=0 ECTS=3.18	6	July 17, 2024																																										
<b>AUTHORIZATION</b>	<b>SP Developer</b>		<b>Course Cluster Coordinator</b>		<b>Study Program Coordinator</b>																																										
	.....		.....		Dr. H. Sunu Kuntjoro, S.Si., M.Si.																																										
<b>Learning model</b>	<b>Project Based Learning</b>																																														
<b>Program Learning Outcomes (PLO)</b>	<b>PLO study program that is charged to the course</b>																																														
	<b>Program Objectives (PO)</b>																																														
	<b>PLO-PO Matrix</b>																																														
		P.O																																													
<b>Short Course Description</b>	<b>PO Matrix at the end of each learning stage (Sub-PO)</b>																																														
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">P.O</td> <td colspan="15" style="text-align: center;">Week</td> </tr> <tr> <td></td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6</td> <td style="text-align: center;">7</td> <td style="text-align: center;">8</td> <td style="text-align: center;">9</td> <td style="text-align: center;">10</td> <td style="text-align: center;">11</td> <td style="text-align: center;">12</td> <td style="text-align: center;">13</td> <td style="text-align: center;">14</td> <td style="text-align: center;">15</td> <td style="text-align: center;">16</td> </tr> </table>														P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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<b>References</b>	<b>Main :</b> 1. Hughes, D. A., L. Gail Darlington, Adrienne Bendich. 2004. Diet and Human Immune Function . Totowa, New Jersey: Humana Press. 2. Park, Young W. dan George F.W. Haenlein. 2013. Milk and Dairy Product in Human Nutrition: Production, Composition and Health . IOWA : John Wiley & Sons, Ltd.																																														
	<b>Supporters:</b>																																														
<b>Supporting lecturer</b>	Dr. Raharjo, M.Si. Guntur Trimulyono, S.Si., M.Sc. Ahmad Bashri, S.Pd., M.Si. Sari Kusuma Dewi, S.Si., M.Si.																																														
<b>Week-</b>	<b>Final abilities of each learning stage (Sub-PO)</b>	<b>Evaluation</b>		<b>Help Learning, Learning methods, Student Assignments, [ Estimated time]</b>		<b>Learning materials [ References ]</b>	<b>Assessment Weight (%)</b>																																								
		<b>Indicator</b>	<b>Criteria &amp; Form</b>	<b>Offline ( offline )</b>	<b>Online ( online )</b>																																										
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)																																								

1	Understand the meaning of food biology and provide an overview of the application and use of biological science in the food sector.	<ol style="list-style-type: none"> <li>1.Describe the meaning of food biology</li> <li>2.Utilizing biological science in the food sector</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1.Assignments with a weight of 30%UTS weight of 20%</li> <li>2.Student activities and responses during learning activities are assessed as participation, weight 20%</li> <li>3.UAS weight 30%</li> <li>4.Essay questions are accessed together on UTS</li> <li>5.Performance questions are integrated during learning</li> </ol>	Discussion and assignment 2 X 50			0%
2	Understanding the role of microbes in fermented foods	<ol style="list-style-type: none"> <li>1.Explain the meaning and process of fermentation</li> <li>2.Describe the types of fermentation based on the compounds produced</li> <li>3.Describe examples of fermented food products</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1.Tasks with a weight of 30%</li> <li>2.UTS weight 20%</li> <li>3.Student activities and responses during learning activities are assessed as participation, weight 20%</li> <li>4.UAS weight 30%</li> <li>5.Essay questions are accessed together on UTS</li> <li>6.Performance questions are integrated during learning</li> </ol>	Discussion and assignment 2 X 50			0%
3	Understand the interaction of microbes and food in the food preservation and processing process to produce quality food products	<ol style="list-style-type: none"> <li>1.Explain the interaction of microbes and food ingredients in the preservation process</li> <li>2.Explain the interaction of microbes and food ingredients in producing quality food products</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1.Tasks with a weight of 30%</li> <li>2.UTS weight 20%</li> <li>3.Student activities and responses during learning activities are assessed as participation, weight 20%</li> <li>4.UAS weight 30%</li> <li>5.Essay questions are accessed together on UTS</li> <li>6.Performance questions are integrated during learning</li> </ol>	Discussion and assignment 2 X 50			0%
4	Understand the control of microbial growth and metabolism for the purposes of food production or food ingredients.	<ol style="list-style-type: none"> <li>1.Explain the control of microbial growth and metabolism in food</li> <li>2.Describe examples of microbial control in food products</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1.Tasks with a weight of 30%</li> <li>2.UTS weight 20%</li> <li>3.Student activities and responses during learning activities are assessed as participation, weight 20%</li> <li>4.UAS weight 30%</li> <li>5.Essay questions are accessed together on UTS</li> <li>6.Performance questions are integrated during learning</li> </ol>	Discussion and assignment 2 X 50			0%

5	Understand natural preservation (biopreservation) of food ingredients and examples of preservatives to maintain the safety of food products	<ol style="list-style-type: none"> <li>1.Explain the natural preservation of food</li> <li>2.Describe examples of safe natural food preservatives</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1.Tasks with a weight of 30%</li> <li>2.UTS weight 20%</li> <li>3.Student activities and responses during learning activities are assessed as participation, weight 20%</li> <li>4.UAS weight 30%</li> <li>5.Essay questions are accessed together on UTS and UAS</li> <li>6.Performance questions are integrated during learning</li> </ol>	Discussion and assignment 2 X 50			0%
6	Understand the role of biotechnology in the food sector	<ol style="list-style-type: none"> <li>1.Explain the meaning and principles of biotechnology</li> <li>2.Describe the types of biotechnology</li> <li>3.Describe examples of food products resulting from biotechnology</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1.Tasks with a weight of 30%</li> <li>2.UTS weight 20%</li> <li>3.Student activities and responses during learning activities are assessed as participation, weight 20%</li> <li>4.UAS weight 30%</li> <li>5.Essay questions are accessed together on UTS and UAS</li> <li>6.Performance questions are integrated during learning</li> </ol>	Discussion and assignment 2 X 50			0%
7	Understand the role of genetic engineering in the food sector	<ol style="list-style-type: none"> <li>1.Explain the meaning and principles of genetic engineering</li> <li>2.Describe examples of the application of genetic engineering in the food sector</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1.Tasks with a weight of 30%</li> <li>2.UTS weight 20%</li> <li>3.Student activities and responses during learning activities are assessed as participation, weight 20%</li> <li>4.UAS weight 30%</li> <li>5.Essay questions are accessed together on UTS and UAS</li> <li>6.Performance questions are integrated during learning</li> </ol>	Discussion and assignment 2 X 50			0%
8	UTS	Meeting indicators 1 to 7	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1.Tasks with a weight of 30%</li> <li>2.UTS weight 20%</li> <li>3.Student activities and responses during learning activities are assessed as participation, weight 20%</li> <li>4.UAS weight 30%</li> <li>5.Essay questions are accessed together on UTS and</li> <li>6.Performance questions are integrated during learning</li> </ol>	Meetings 1 to 7 2 X 50			0%

9	Understand the role of biology in increasing food crop production	<ol style="list-style-type: none"> <li>1.Explain the role of biology in increasing food crop production</li> <li>2.Describe examples of the results of applying biological science in food crop production</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1.Tasks with a weight of 30%</li> <li>2.UTS weight 20%</li> <li>3.Student activities and responses during learning activities are assessed as participation, weight 20%</li> <li>4.UAS weight 30%</li> <li>5.Essay questions are accessed together on UTS and UAS</li> <li>6.Performance questions are integrated during learning</li> </ol>	Discussion and assignment 2 X 50			0%
10	Understand the role of biology in the field of fisheries	<ol style="list-style-type: none"> <li>1.Explain the role of biology in the field of fisheries</li> <li>2.Describe examples of the results of applying biology in the fisheries sector</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1.Duty weight 30%</li> <li>2.UTS weight 20%</li> <li>3.Student activities and responses during learning activities are assessed as participation, weight 20%</li> <li>4.UAS weight 30%</li> <li>5.Essay questions are accessed together on UTS and UAS</li> <li>6.Performance questions are integrated during learning</li> </ol>	Discussion and assignment 2 X 50			0%
11	Understand the role of biology in the field of animal husbandry	<ol style="list-style-type: none"> <li>1.Explain the role of biology in animal husbandry</li> <li>2.Describe examples of the results of applying biology in the field of animal husbandry</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1.Tasks with a weight of 30%</li> <li>2.UTS weight 20%</li> <li>3.Student activities and responses during learning activities are assessed as participation, weight 20%</li> <li>4.UAS weight 30%</li> <li>5.Essay questions are accessed together on UTS and UAS</li> <li>6.Performance questions are integrated during learning</li> </ol>	Discussion and assignment 2 X 50			0%
12	Understand the role of biology in the food industry	<ol style="list-style-type: none"> <li>1.Explain the role of biology in the food industry</li> <li>2.Describe examples of the results of applying biology in the food industry</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1.Tasks with a weight of 30%</li> <li>2.UTS weight 20%</li> <li>3.Student activities and responses during learning activities are assessed as participation, weight 20%</li> <li>4.UAS weight 30%</li> <li>5.Essay questions are accessed together on UTS and UAS</li> <li>6.Performance questions are integrated during learning</li> </ol>	Discussion and assignment 2 X 50			0%

13	Understanding food safety standards in terms of biological studies	<ol style="list-style-type: none"> <li>1.Explain food safety standards</li> <li>2.Describe examples of the application of biology in determining food safety standards</li> <li>3.Potential biological hazards (microorganisms) in food</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1.Tasks with a weight of 30%</li> <li>2.UTS weight 20%</li> <li>3.Student activities and responses during learning activities are assessed as participation, weight 20%</li> <li>4.UAS weight 30%</li> <li>5.Essay questions are accessed together on UTS and UAS</li> <li>6.Performance questions are integrated during learning</li> </ol>	Discussion and assignment 2 X 50			0%
14	Understand food ingredient testing procedures to determine the quality of food ingredients based on biological studies	<ol style="list-style-type: none"> <li>1.Explains food quality testing</li> <li>2.Describe examples of food quality testing</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1.Tasks with a weight of 30%</li> <li>2.UTS weight 20%</li> <li>3.Student activities and responses during learning activities are assessed as participation, weight 20%</li> <li>4.UAS weight 30%</li> <li>5.Essay questions are accessed together on UTS and UAS</li> <li>6.Performance questions are integrated during learning</li> </ol>	Discussion and assignment 2 X 50			0%
15	Understanding food biochemistry studies aspects of the interaction of various food, nutritional and non-nutritional components on metabolism, human health and the design of functional food products.	<ol style="list-style-type: none"> <li>1.Explain the biochemistry of food</li> <li>2.Describe the interaction of food components on human body metabolism</li> <li>3.Describe examples of functional food product design</li> </ol>	<b>Criteria:</b> <ol style="list-style-type: none"> <li>1.Tasks with a weight of 30%</li> <li>2.UTS weight 20%</li> <li>3.Student activities and responses during learning activities are assessed as participation, weight 20%</li> <li>4.UAS weight 30%</li> <li>5.Essay questions are accessed together on UTS and UAS</li> <li>6.Performance questions are integrated during learning</li> </ol>	Discussion and assignment 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.