



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

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight	SEMESTER	Compilation Date																																																		
General biology	4720103019	Compulsory Study Program Subjects	T=3 P=0 ECTS=4.77	1	July 3, 2023																																																		
AUTHORIZATION		SP Developer	Course Cluster Coordinator	Study Program Coordinator																																																			
		Prof. Dr. Yuliani, M.Si	Dr. Amaria, M.Si.																																																			
Learning model	Project Based Learning																																																						
Program Learning Outcomes (PLO)	PLO study program that is charged to the course																																																						
	Program Objectives (PO)																																																						
	PO - 1	Mastering the basic concepts of biology, namely Biology as a science, cell structure and function, cell division, metabolism which includes transport, photosynthesis and respiration, genetics, diversity of living things, evolution, structure and function of plant and animal organ tissues, ecology, growth and development microbes, biotechnology, and practice solving problems through scientific methods																																																					
	PLO-PO Matrix																																																						
		<table border="1" style="margin: auto;"> <tr><td>P.O</td></tr> <tr><td>PO-1</td></tr> </table>				P.O	PO-1																																																
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PO-1																																																							
PO Matrix at the end of each learning stage (Sub-PO)																																																							
	<table border="1" style="margin: auto;"> <tr> <td rowspan="2">P.O</td> <td colspan="16">Week</td> </tr> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td> </tr> <tr> <td>PO-1</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>					P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	PO-1																
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PO-1																																																							
Short Course Description	Understand the basic concepts of Biology as a science, structure and function of cells, metabolism which includes transport, photosynthesis and respiration, genetics, diversity of living things and nomenclature, origins of life, evolution, structure and function of plant and animal organ tissues, ecology, organism behavior and biotechnology, and practice solving problems using scientific methods. General Biology studies are accompanied by various process skills (minds on activity and hands on activity) which will be used to solve problems in the field of Biology and its applications. Learning is delivered through presentations, discussions and practicums.																																																						
References	Main :																																																						
	<ol style="list-style-type: none"> 1. Campbell, Neil A, Jane B.Reece dan Lawrence G.Mitchell. 2003. Biologi . California: Benjamin Cummings. 2. Kimball, J.W. 1989. Biologi Jilid I, II, III . Edisi Kelima. Cetakan Kedua. Jakarta: Penerbit Erlangga. 3. Rachmadiarti, F.,Yuliani, Widowati B., Rinie P, Mahanani T.A, Dyah H.,Herlina F.2007. Biologi Umum . Surabaya: UNESA Press. 4. Luria. 1981. A View of Life . California: Benyamin Cumming. 																																																						
	Supporters:																																																						
Supporting lecturer	Dra. Evie Ratnasari, M.Si. Dra. Herlina Fitrihidajati, M.Si. Dr. Nur Ducha, S.Si., M.Si. Dr. H. Sunu Kuntjoro, S.Si., M.Si. Guntur Trimulyono, S.Si., M.Sc. Nur Qomariyah, S.Pd., M.Sc.																																																						
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 steps of the scientific method in experimental research independently and honestly	<ol style="list-style-type: none"> 1.Explain the steps of the scientific method 2.Apply the steps of the scientific method in a simple experiment 3.Skilled in applying biological concepts in carrying out simple experiments 4.Demonstrate an honest and independent attitude during the learning process using observation instruments 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. The assessment is carried out on the following aspects: 2. Participation during lectures is carried out through observing honest and independent attitudes. Student activities and responses during learning activities, especially practicals, are also assessed as participation, weight 20% 3. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 4. UTS weight 20% 5. US weight 30% 6. Essay questions are accessed jointly on UTS and US 7. Performance questions are integrated during learning <p>Form of Assessment : Participatory Activities</p>	presentation discussion, practicum/trial activities 3 X 50		<p>Material: Scientific Methods References: <i>Rachmadiarti, F., Yuliani, Widowati B., Rinie P, Mahanani TA, Dyah H., Herlina F. 2007. General biology . Surabaya: UNESA Press.</i></p>	5%
2	Explain the structure of organism cells and relate them to their functions independently and honestly	<ol style="list-style-type: none"> 1. Describe the structure of cells 2. Explain the chemistry of life 3. Skilled in operating a microscope independently 4. Skilled in making observations with a microscope to compare plant and animal cells 5. Demonstrate an honest and independent attitude during the learning process using observation instruments 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. The assessment is carried out on the following aspects: 2. Participation during lectures is carried out through observing honest and independent attitudes. Student activities and responses during learning activities, especially practicals, are also assessed as participation, weight 20% 3. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 4. UTS weight 20% 5. US weight 30% 6. Essay questions are accessed jointly on UTS and US 7. Performance questions are integrated during learning <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	Presentation discussions, practical activities, 3 X 50 assignments		<p>Material: Cell Structure and Function References: <i>Campbell, Neil A, Jane B. Reece and Lawrence G. Mitchell. 2003. Biology. California: Benjamin Cummings.</i></p>	5%

3	Understand the concept of cell membranes and the stages of cell division	<ol style="list-style-type: none"> 1. Describe the cell membrane 2. Explain the stages of cell division 3. Skilled in carrying out practical activities like a drop of water in life 4. Demonstrate an honest and independent attitude during the learning process using observation instruments 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. The assessment is carried out on the following aspects: 2. Participation during lectures is carried out through observing honest and independent attitudes. Student activities and responses during learning activities, especially practicals, are also assessed as participation, weight 20% 3. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 4. UTS weight 20% 5. US weight 30% 6. Essay questions are accessed jointly on UTS and US 7. Performance questions are integrated during learning <p>Form of Assessment : Participatory Activities, Practical Assessment</p>	Presentation discussion, 3 X 50 practical activities		<p>Material: Cell Membranes and Stages of Division Bibliography: <i>Campbell, Neil A, Jane B. Reece and Lawrence G. Mitchell. 2003. Biology. California: Benjamin Cummings.</i></p>	10%
4	Distinguish between various types of cell transport used in daily life independently and honestly	<ol style="list-style-type: none"> 1. Explain the concept of cell transport 2. Distinguish between passive and active transport 3. Skilled in carrying out practical activities observing cell plasmolysis 4. Demonstrate an honest and independent attitude during the learning process using observation instruments 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. The assessment is carried out on the following aspects: 2. Participation during lectures is carried out through observing honest and independent attitudes. Student activities and responses during learning activities, especially practicals, are also assessed as participation, weight 20% 3. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 4. UTS weight 20% 5. US weight 30% 6. Essay questions are accessed jointly on UTS and US 7. Performance questions are integrated during learning <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	presentation discussion, 3 X 50 practical activities		<p>Material: Cell Transport Bibliography: <i>Campbell, Neil A, Jane B. Reece and Lawrence G. Mitchell. 2003. Biology. California: Benjamin Cummings.</i></p>	5%

5	Understand the concept of photosynthesis and relate it to the physiological processes of plants and their benefits for other organisms independently and honestly	<ol style="list-style-type: none"> 1.Explain the concept of photosynthesis and relate it to the physiological processes of plants and its benefits for other organisms 2.Skilled in carrying out photosynthesis experimental activities 3.Demonstrate an honest and independent attitude during the learning process using the observation instrument sheet 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. The assessment is carried out on the following aspects: 2. Participation during lectures is carried out through observing honest and independent attitudes. Student activities and responses during learning activities, especially practicals, are also assessed as participation, weight 20% 3. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 4. UTS weight 20% 5. US weight 30% 6. Essay questions are accessed jointly on UTS and US 7. Performance questions are integrated during learning <p>Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Practical Assessment</p>	presentation discussion, 3 X 50 practical activities		<p>Material: Photosynthesis References: Rachmadiarti, F., Yuliani, Widowati B., Rinie P., Mahanani TA, Dyah H., Herlina F. 2007. <i>General biology</i>. Surabaya: UNESA Press.</p>	10%
6	Understand the concept of respiration and relate it to physiological processes and its benefits for other organisms independently and honestly	<ol style="list-style-type: none"> 1.Explain the concept of respiration and relate it to physiological processes and its benefits for other organisms 2.Skilled in carrying out respiration rate experimental activities 3.Demonstrate an honest and independent attitude during the learning process using the observation instrument sheet 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. The assessment is carried out on the following aspects: 2. Participation during lectures is carried out through observing honest and independent attitudes. Student activities and responses during learning activities, especially practicals, are also assessed as participation, weight 20% 3. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 4. UTS weight 20% 5. US weight 30% 6. Essay questions are accessed jointly on UTS and US 7. Performance questions are integrated during learning <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	presentation discussion, 3 X 50 practical activities		<p>Material: Cell Respiration References: Rachmadiarti, F., Yuliani, Widowati B., Rinie P., Mahanani TA, Dyah H., Herlina F. 2007. <i>General biology</i>. Surabaya: UNESA Press.</p>	5%

7	Understand the concept of gene and chromosome structure, DNA, RNA, protein synthesis independently and honestly	<ul style="list-style-type: none"> · Describe the structure of genes and chromosomes and relate it to the mutation process in organisms · Differentiate the structure of DNA and RNA, and relate it to the DNA replication process · Explain the process of protein synthesis · Demonstrate an honest and independent attitude during the learning process using the observation instrument sheet 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. The assessment is carried out on the following aspects: 2. Participation during lectures is carried out through observing honest and independent attitudes. Student activities and responses during learning activities, especially practicals, are also assessed as participation, weight 20% 3. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 4. UTS weight 20% 5. US weight 30% 6. Essay questions are assessed jointly on UTS and US 7. Performance questions are integrated during learning <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	presentation discussion, 3 X 50 practical activities		<p>Material: GENE STRUCTURE, CHROMOSOMES, DNA</p> <p>References: <i>Rachmadiarti, F., Yuliani, Widowati B., Rinie P, Mahanani TA, Dyah H., Herlina F. 2007. General biology . Surabaya: UNESA Press.</i></p>	3%
8	Understand General Biology material from the first to the seventh meeting	Skilled in applying basic Biological concepts and principles responsibly	<p>Criteria:</p> <ul style="list-style-type: none"> · UTS weight 20% <p>Form of Assessment : Test</p>	Written Test 2 X 50		<p>Material: Midterm Exam</p> <p>References: <i>Rachmadiarti, F., Yuliani, Widowati B., Rinie P, Mahanani TA, Dyah H., Herlina F. 2007. General biology . Surabaya: UNESA Press.</i></p>	20%

9	Understand Mendel's laws and relate them to the process of inheritance of traits and the balance of gene frequencies in organisms independently and honestly	Describe Mendel's laws and relate them to the process of inheritance of traits and the balance of gene frequencies in organisms	<p>Criteria:</p> <ol style="list-style-type: none"> 1. The assessment is carried out on the following aspects: 2. Participation during lectures is carried out through observing honest and independent attitudes. Student activities and responses during learning activities, especially practicals, are also assessed as participation, weight 20% 3. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 4. UTS weight 20% 5. US weight 30% 6. Essay questions are accessed jointly on UTS and US 7. Performance questions are integrated during learning <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	Discussion and presentation 3 X 50			2%
10	Distinguish between the theories of abiogenesis and biogenesis and understand genetic populations independently and honestly	<ul style="list-style-type: none"> - Differentiate the theories of abiogenesis and biogenesis and understand population genetics - Demonstrate an honest and independent attitude during the learning process using observation instrument sheets 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. The assessment is carried out on the following aspects: 2. Participation during lectures is carried out through observing honest and independent attitudes. Student activities and responses during learning activities, especially practicals, are also assessed as participation, weight 20% 3. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 4. UTS weight 20% 5. US weight 30% 6. Essay questions are accessed jointly on UTS and US 7. Performance questions are integrated during learning <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	Discussion Presentation 3 X 50		<p>Material: Biogenesis, Abiogenesis and Evolution Theory. References: <i>Campbell, Neil A, Jane B. Reece and Lawrence G. Mitchell. 2003. Biology. California: Benjamin Cummings.</i></p>	5%

11	Classify various living things based on a classification system independently and honestly	<ol style="list-style-type: none"> 1. Classify various living things based on a classification system 2. Explain the occurrence of variations 3. Skilled in creating dichotomous keys 4. Demonstrate an honest and independent attitude during the learning process using the observation instrument sheet 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. The assessment is carried out on the following aspects: 2. Participation during lectures is carried out through observing honest and independent attitudes. Student activities and responses during learning activities, especially practicals, are also assessed as participation, weight 20% 3. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 4. UTS weight 20% 5. US weight 30% 6. Essay questions are accessed jointly on UTS and US 7. Performance questions are integrated during learning <p>Form of Assessment : Participatory Activities, Practical Assessment</p>	presentation discussion, 3 X 50 practical activities		<p>Material: Biodiversity and Classification of Living Creatures</p> <p>References: <i>Rachmadiarti, F., Yuliani, Widowati B., Rinie P, Mahanani TA, Dyah H., Herlina F. 2007. General biology . Surabaya: UNESA Press.</i></p>	2%
12	Understand the structure of tissues and organs and relate their functions independently and honestly	Describe the structure of tissues and organs (plants and animals) and relate their functions	<p>Criteria:</p> <ol style="list-style-type: none"> 1. The assessment is carried out on the following aspects: 2. Participation during lectures is carried out through observing honest and independent attitudes. Student activities and responses during learning activities, especially practicals, are also assessed as participation, weight 20% 3. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 4. UTS weight 20% 5. US weight 30% 6. Essay questions are accessed jointly on UTS and US 7. Performance questions are integrated during learning <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	Presentation. Observation, Discussion 3 X 50		<p>Material: Body Function Structure of Animals and Plants</p> <p>References: <i>Campbell, Neil A, Jane B. Reece and Lawrence G. Mitchell. 2003. Biology. California: Benjamin Cummings.</i></p>	3%

13	Understanding Microbial Growth and Development	<ol style="list-style-type: none"> 1. Analyzing microbial growth 2. Explain the factors that influence the growth and development of microbes 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. The assessment is carried out on the following aspects: 2. Participation during lectures is carried out through observing honest and independent attitudes. Student activities and responses during learning activities, especially practicals, are also assessed as participation, weight 20% 3. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 4. UTS weight 20% 5. US weight 30% 6. Essay questions are accessed jointly on UTS and US 7. Performance questions are integrated during learning <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	presentation discussion, 3 X 50 practical activities		<p>Material: Growth and Development of Microbes References: <i>Campbell, Neil A, Jane B. Reece and Lawrence G. Mitchell. 2003. Biology. California: Benjamin Cummings.</i></p>	3%
14	Understand ecological concepts and apply them in daily life independently and honestly	<ol style="list-style-type: none"> 1. Explain about ecology 2. carry out research related to ecosystems, 3. communicate the results of investigations and apply them in everyday life. 4. Demonstrate an honest and independent attitude during the learning process using the observation instrument sheet 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. The assessment is carried out on the following aspects: 2. Participation during lectures is carried out through observing honest and independent attitudes. Student activities and responses during learning activities, especially practicals, are also assessed as participation, weight 20% 3. Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% 4. UTS weight 20% 5. US weight 30% 6. Essay questions are accessed jointly on UTS and US 7. Performance questions are integrated during learning 	presentation discussion, 3 X 50 practical activities		<p>Material: Ecology Literature: <i>Rachmadiarti, F., Yuliani, Widowati B., Rinie P, Mahanani TA, Dyah H., Herlina F. 2007. General biology . Surabaya: UNESA Press.</i></p>	2%

15	Understand biotechnology and apply it in daily life independently and honestly	1.distinguish between traditional and modern biotechnology 2.apply biotechnology in everyday life 3.Demonstrate an honest and independent attitude during the learning process using the observation instrument sheet	<p>Criteria:</p> <ol style="list-style-type: none"> The assessment is carried out on the following aspects: Participation during lectures is carried out through observing honest and independent attitudes. Student activities and responses during learning activities, especially practicals, are also assessed as participation, weight 20% Practical reports and products are assessed as ASSIGNMENTS with a weight of 30% UTS weight 20% US weight 30% Essay questions are assessed jointly on UTS and US Performance questions are integrated during learning <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	presentation discussion, 3 X 50 practical activities		<p>Material: Biotechnology Bibliography: <i>Campbell, Neil A, Jane B. Reece and Lawrence G. Mitchell. 2003. Biology. California: Benjamin Cummings.</i></p>	5%
16	Understand general biology material from the 9th to 10th meeting	Students can do UAS questions well	<p>Criteria: Written exam</p> <p>Form of Assessment : Test</p>				30%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	32.33%
2.	Project Results Assessment / Product Assessment	21.33%
3.	Practical Assessment	9.33%
4.	Test	50%
		100%

Notes

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Forms of assessment:** test and non-test.
- 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.
- 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.
- Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
- 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%.
- TM=Face to face, PT=Structured assignments, BM=Independent study.

