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

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
General biology	8420103023	Compulsory Study Program Subjects	T=3	P=0	ECTS=4.77	1	April 26, 2023

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
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Learning model: Project Based Learning

Program Learning Outcomes (PLO)

PLO study program that is charged to the course

Program Objectives (PO)

PO - 1	Able to show a responsible attitude, demonstrate a scientific, critical and innovative attitude independently during the lecture process in general biology courses
PO - 2	Able to master substantive concepts of general biology and their application to solve problems in everyday life
PO - 3	Able to demonstrate independent, quality and measurable performance as well as make appropriate decisions and be able to work individually and in a team
PO - 4	Able to plan, carry out and evaluate experimental activities related to biology in general according to substantive and procedural concepts as well as science process skills

PLO-PO Matrix

P.O
PO-1
PO-2
PO-3
PO-4

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
PO-1																
PO-2																
PO-3																
PO-4																

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 :

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. Luria. 1981. A View of Life . California: Benyamin Cumming.
4. Rachmadiarti, F.,Yuliani, Widowati B., Rinie P, Mahanani T.A, Dyah H.,Herlina F.2018. Biologi Umum. Surabaya: UNESA Press.

Supporters:

	1. Rachmadiarti, F.,Yuliani, Widowati B., Rinie P, Mahanani T.A, Dyah H.,Herlina F.2018. Biologi Umum. Surabaya: UNESA Press.
Supporting lecturer	Dr. Dyah Astriani, S.Pd., M.Pd. Ahmad Qosyim, S.Si., M.Pd. Enny Susiyawati, S.Si., M.Sc., M.Pd., Ph.D. Dhita Ayu Permata Sari, S.Pd., M.Pd. Aris Rudi Purnomo, S.Si., M.Pd., M.Sc. Fasih Bintang Ilhami, S.Kep., M.T., Ph.D. Dr. Sapti Puspitarini, S.Si., M.Si. Fikky Dian Roqobih, 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 steps of the scientific method in experimental research independently and honestly	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	**Criteria:** 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 **Form of Assessment** : Participatory Activities	presentation discussion, practicum/trial activities 3 X 50		**Material:** Scientific Method **Bibliography:** *Campbell, Neil A, Jane B. Reece and Lawrence G. Mitchell. 2003. Biology. California: Benjamin Cummings.*	5%

2	Explain the structure of organism cells and relate them to their functions independently and honestly	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	**Criteria:** 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 **Form of Assessment** : Participatory Activities, Tests	Presentation discussion, 3 X 50 practical activities		**Material:** Cell Structure and Life Chemistry **Bibliography:** *Campbell, Neil A, Jane B. Reece and Lawrence G. Mitchell. 2003. Biology. California: Benjamin Cummings.*	5%
3	Understand the concept of cell membranes and the stages of cell division	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	**Criteria:** 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 **Form of Assessment** : Participatory Activities, Tests	Presentation discussion, 3 X 50 practical activities		**Material:** structure of genes and chromosomes and links to the mutation process in organisms. **Reference:** *Luria. 1981. A View of Life. California: Benjamin Cumming.*	5%

4	Distinguish between various types of cell transport used in daily life independently and honestly	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	**Criteria:** 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 **Form of Assessment** : Participatory Activities, Practical Assessment	presentation discussion, 3 X 50 practical activities		**Material:** mitosis and meiosis cell division **Reference:** *Luria. 1981. A View of Life. California: Benjamin Cumming.*	5%
5	Understand the concept of photosynthesis and relate it to the physiological processes of plants and their benefits to other organisms independently and honestly	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	**Criteria:** 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 **Form of Assessment** : Participatory Activities, Practical Assessment	presentation discussion, 3 X 50 practical activities		**Material:** Cell Transport (Active and Passive) **References:** *Campbell, Neil A, Jane B. Reece and Lawrence G. Mitchell. 2003. Biology. California: Benjamin Cummings.*	5%

6	Understand the concept of respiration and relate it to physiological processes and its benefits for other organisms independently and honestly	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	**Criteria:** 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 **Form of Assessment** : Participatory Activities, Practical Assessment	presentation discussion, 3 X 50 practical activities		**Material:** Photosynthesis and its relationship in plant physiological processes. **References:** *Campbell, Neil A, Jane B. Reece and Lawrence G. Mitchell. 2003. Biology. California: Benjamin Cummings.*	5%
7	Understand the concept of gene and chromosome structure, DNA, RNA, protein synthesis independently and honestly	· 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	**Criteria:** 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 **Form of Assessment** : Participatory Activities, Tests	presentation discussion, 3 X 50 practical activities		**Material:** Respiration and its relationship in plant physiological processes. **References:** *Campbell, Neil A, Jane B. Reece and Lawrence G. Mitchell. 2003. Biology. California: Benjamin Cummings.*	10%

8	Understand the concept of gene and chromosome structure, DNA, RNA, protein synthesis independently and honestly	· 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	**Criteria:** 1. Essay questions are accessed jointly on UTS and US 2. Performance questions are integrated during learning **Form of Assessment** : Test	100' Midterm Exam	-	**Material:** Respiration and its relationship in plant physiological processes. **References:** *Campbell, Neil A, Jane B. Reece and Lawrence G. Mitchell. 2003. Biology. California: Benjamin Cummings.*	0%
9	Describe the structure of plant tissues and organs and relate their functions	Describe the structure of plant tissues and organs and relate their functions b. Accuracy in describing the structure of animal tissues and organs and relating them to their function	**Criteria:** 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 **Form of Assessment** : Participatory Activities, Tests	Discussion and presentation 3 X 50		**Material:** Plant tissues and organs and their functions **References:**	5%

10	Describe the principles of Mendel's laws and relate them to the process of inheritance	Describe the principles of Mendel's laws and relate them to the process of inheritance	**Criteria:** 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 **Form of Assessment** : Participatory Activities, Tests	Discussion Presentation 3 X 50		**Material:** Mendel's Laws and Gene Frequency Balance **Library:** **Material:** Mendel's Laws and Gene Frequency Balance. **References:** *Campbell, Neil A, Jane B. Reece and Lawrence G. Mitchell. 2003. Biology. California: Benjamin Cummings.*	5%
11	Classify various living things based on a classification system independently and honestly	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	**Criteria:** 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 **Form of Assessment** : Participatory Activities, Tests	presentation discussion, 3 X 50 practical activities		**Material:** Classification of Living Things **Library:** *Luria. 1981. A View of Life. California: Benjamin Cumming.*	10%

12	Able to explain the concept of growth and development of microbes (bacteria and fungi) and viruses according to substantive and procedural concepts based on a scientific attitude.	Describe the concept of growth and development of microbes (bacteria and fungi) and viruses according to substantive and procedural concepts based on a scientific attitude.	**Criteria:** 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 **Form of Assessment** : Participatory Activities, Practical Assessment	Presentation. Observation, Discussion 3 X 50		**Material:** growth and development of microbes and viruses **References:** *Campbell, Neil A, Jane B. Reece and Lawrence G. Mitchell. 2003. Biology. California: Benjamin Cummings.*	10%
13	Analyze the role of abiotic-biotic components and their interactions	1. Distinguish between innate and taught animal behavior with simple examples 2. Skilled in observing animal behavior honestly	**Criteria:** 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 **Form of Assessment** : Participatory Activities, Tests	presentation discussion, 3 X 50 practical activities		**Material:** Evolution **Bibliography:** *Kimball, JW 1989. Biology Volumes I, II, III. Fifth Edition. Second printing. Jakarta: Erlangga Publishers.*	10%

14	Understand ecological concepts and apply them in daily life independently and honestly	1. Explain 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	**Criteria:** 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 **Form of Assessment** : Participatory Activities	presentation discussion, 3 X 50 practical activities		**Material:** Ecology **Bibliography:** *Luria. 1981. A View of Life. California: Benjamin Cumming.*	10%
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	**Criteria:** 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 **Form of Assessment** : Participatory Activities, Practical Assessment	presentation discussion, 3 X 50 practical activities		**Material:** Biotechnology **Bibliography:** *Campbell, Neil A, Jane B. Reece and Lawrence G. Mitchell. 2003. Biology. California: Benjamin Cummings.*	10%
16	Sub-CPMK Meetings 1 - 15	Assessment indicators according to meetings 1 - 15	**Criteria:** Performance questions are integrated during learning **Form of Assessment** : Test	3 X 50 Semester Final Exam	-	**Material:** Biotechnology **Bibliography:** *Campbell, Neil A, Jane B. Reece and Lawrence G. Mitchell. 2003. Biology. California: Benjamin Cummings.*	0%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	57.5%
2.	Practical Assessment	17.5%
3.	Test	25%
		100%

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.