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

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Evolution	4620102064		T=2	P=0	ECTS=3.18	5	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	Dr. H. Sunu Kuntjoro, S.Si., M.Si.

Learning model	**Project Based Learning**	
Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**	
	PLO-6	Able to apply logical, critical, systematic and innovative thinking in the context of developing or implementing science and/or technology according to their field of expertise.
	PLO-10	Able to design and conduct experiments in the field of biology, manage, analyze, interpret, document and store research data, to manage biological natural resources
	PLO-13	Able to demonstrate basic knowledge of cell and molecular biology, organismal biology, ecology and evolution to analyze current biological issues
	Program Objectives (PO)	
	PO - 1	Students can have an understanding of the reconstruction process in palentology to explain the evolutionary process, human evolution with various theories that explain it, evolution on a geological time scale and the origins of living things with various theories that explain it, Lamarck's and Darwin's theories of evolution, evidence both direct and indirect directly showing evolutionary phenomena in nature, as well as evolutionary mechanisms for understanding phenomena that exist in nature
	PO - 2	Students are able to apply evolutionary theory and relevant technology in the management of biological resources and tropical environments, as well as handling environmental problems and issues
	PO - 3	Students can use ICT to update their understanding of evolutionary phenomena that occur in nature and the various theoretical conflicts that surround them
	PO - 4	Students are able to apply logical, critical and systematic thinking in studying the theory of evolution as a scientific theory to understand the diversity of living creatures
	PLO-PO Matrix	

P.O	PLO-6	PLO-10	PLO-13
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	Studying evolutionary phenomena that occur in nature with various conflicting theories surrounding them, the reconstruction process in palentology, human evolution with various theories that explain it, evolution on a geological time scale and the origins of living things with various theories that explain it, Lamarck's and Darwin's theories of evolution, evidence, both direct and indirect, that shows evolutionary phenomena in nature, as well as evolutionary mechanisms for understanding phenomena that exist in nature	
References	**Main :**	

	1. Barton, Nicholas H ...[et.al]. 2007. Evolution. New York: Cold Spring Harbor. 2. Fowler, Thomas B / I. Kuebler, Daniel. 2007. The Evolution Controversy. Michigan: Baker Academic. 3. Freeman, Scott / I. Herron, Jon C. 2005. Evolutionary Analysis. New Jersey: Pearson Prentice Hall. 4. Kampourakis, Kostas. 2014. Understanding Evolution . USA: Cambridge University Press. 5. Thomson, R. Paul and Denis Walsh. 2014. Evolutionary Biology: Conceptual, Ethical, and Religious Issues. USA: Cambridge University Press.
	Supporters:
	1. Kardong, Kenneth V. 2008. An Introduction to Biological Evolution . New York: McGraw-Hill.
Supporting lecturer	Dra. Winarsih, M.Kes. Dr. Muji Sri Prastiwi, S.Pd., M.Pd. Dwi Anggorowati Rahayu, S.Si., M.Si.

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	Students can understand evolutionary phenomena that occur in nature with the various theoretical conflicts that surround them	1. Explaining the eolution phenomenon based on data (observation) 2. Explain the definition of evolution 3. Explain the limitations/scope of evolutionary studies	**Criteria:** The written test is carried out during USS (weight 20%) and US (weight 30%) of the final grade. Paper and pencil performance is carried out integrated during learning as an assignment grade (weight 30%) Participation grades are given based on the criteria of student activity, student presence and integrity students (Weight 20%) Portfolio assessment is carried out at the end of lecture activities in the form of a student show up as an assignment grade (Weight 30%) **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	a. Watching a film on the collapse of the theory of evolution b. Discussing information on problems that arise with the theory of evolution 2 X 50	do assignments/assignments in the Vinesa LMS -	**Material:** Limitations of Evolutionary Theory **Bibliography:** *Kampourakis, Kostas. 2014. Understanding Evolution. USA: Cambridge University Press.* **Material:** Limitations of Evolutionary Theory **Bibliography:** *Kampourakis, Kostas. 2014. Understanding Evolution. USA: Cambridge University Press.*	8%

2	Students can understand the reconstruction process to explain the evolutionary process	1) Think scientifically (scientific literacy) in reconstructing fossils 2) Explain methods of fossil reconstruction 3) Reconstruct the evolutionary genealogy of a specimen based on developing theories	**Criteria:** The written test is carried out during USS (weight 20%) and US (weight 30%) of the final grade. Paper and pencil performance is carried out integrated during learning as an assignment grade (weight 30%) Participation grades are given based on the criteria of student activity, student presence and integrity students (Weight 20%) Portfolio assessment is carried out at the end of lecture activities in the form of a student show up as an assignment grade (Weight 30%) **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Information discussions, lectures, assignments, e-learning 2 X 50			6%
3	Students can understand natural phenomena with Lamarck's theory of evolution	1) Scientific thinking (scientific literacy) in understanding Lamarck's theory of evolution 2) Explaining Lamarck's theory of evolution 3) Explaining examples of applications of Lamarck's theory of evolution 4) Analyzing life phenomena based on Lamarck's theory of evolution	**Criteria:** The written test is carried out during USS (weight 20%) and US (weight 30%) of the final grade. Paper and pencil performance is carried out integrated during learning as an assignment grade (weight 30%) Participation grades are given based on the criteria of student activity, student presence and integrity students (Weight 20%) Portfolio assessment is carried out at the end of lecture activities in the form of a student show up as an assignment grade (Weight 30%) **Form of Assessment** : Project Results Assessment / Product Assessment	Information discussions, lectures, assignments, e-learning 2 X 50			3%

4	Students can understand natural phenomena with Darwin‘s theory of evolution	1) Scientific thinking (scientific literacy) in understanding Darwin‘s theory of evolution 2) Explaining Darwin‘s theory of evolution 3) Explaining examples of applications of Darwin‘s theory of evolution 4) Analyzing life phenomena based on Darwin‘s theory of evolution.	**Criteria:** The written test is carried out during USS (weight 20%) and US (weight 30%) of the final grade. Paper and pencil performance is carried out integrated during learning as an assignment grade (weight 30%) Participation grades are given based on the criteria of student activity, student presence and integrity students (Weight 20%) Portfolio assessment is carried out at the end of lecture activities in the form of a student show up as an assignment grade (Weight 30%) **Forms of Assessment** : Project Results Assessment / Product Assessment, Practical Assessment	Information discussions, lectures, assignments, e-learning 2 X 50			10%
5	Students can understand evolution on a geological time scale and the origins of living things with various theories that explain it.	1) Scientific thinking (scientific literacy) in understanding evolution on a geological time scale and the origins of living things with various theories 2) Explaining the geological time scale of evolution of living things 3) Explaining theories of the origins of life 4) Evaluating existing theories of the origins of life mutual conflict	**Criteria:** The written test is carried out during USS (weight 20%) and US (weight 30%) of the final grade. Paper and pencil performance is carried out integrated during learning as an assignment grade (weight 30%) Participation grades are given based on the criteria of student activity, student presence and integrity students (Weight 20%) Portfolio assessment is carried out at the end of lecture activities in the form of a student show up as an assignment grade (Weight 30%) **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Information discussions, lectures, assignments, e-learning 2 X 50			2%

6	Students can explain direct and indirect evidence that shows evolutionary phenomena in nature.	1) Think scientifically (scientific literacy) in understanding the evidence for evolution 2) Explain the reasons for fossils as evidence of evolution 3) Explain examples of fossils that can be used as evidence of evolution	**Criteria:** The written test is carried out during USS (weight 20%) and US (weight 30%) of the final grade. Paper and pencil performance is carried out integrated during learning as an assignment grade (weight 30%) Participation grades are given based on the criteria of student activity, student presence and integrity students (Weight 20%) Portfolio assessment is carried out at the end of lecture activities in the form of a student show up as an assignment grade (Weight 30%) **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Information discussions, lectures, assignments, e-learning 2 X 50			2%
7	Students can explain direct and indirect evidence that shows evolutionary phenomena in nature.	1) Think scientifically (scientific literacy) in understanding the evidence for evolution 2) Explain the reasons for comparative anatomy as evidence for evolution 3) Apply comparative anatomy as evidence for the evolution of living things	**Criteria:** The written test is carried out during USS (weight 20%) and US (weight 30%) of the final grade. Paper and pencil performance is carried out integrated during learning as an assignment grade (weight 30%) Participation grades are given based on the criteria of student activity, student presence and integrity students (Weight 20%) Portfolio assessment is carried out at the end of lecture activities in the form of a student show up as an assignment grade (Weight 30%) **Form of Assessment** : Project Results Assessment / Product Assessment, Portfolio Assessment	Information discussions, lectures, assignments, e-learning 2 X 50		**Material:** Evidence for the Theory of Evolution **Bibliography:** *Kampourakis, Kostas. 2014. Understanding Evolution. USA: Cambridge University Press.*	20%
8	UTS Material for meetings 1 to 7	-	**Criteria:** - **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	-	-	**Material:** - **Library:**	15%

9	Students can explain direct and indirect evidence that shows evolutionary phenomena in nature.	1) Think scientifically (scientific literacy) in understanding the evidence for evolution (comparative embryology as evidence of evolution) 2) Explain comparative embryology as evidence for evolution 3) Apply comparative embryology as evidence for the evolution of living things	**Criteria:** The written test is carried out during USS (weight 20%) and US (weight 30%) of the final grade. Paper and pencil performance is carried out integrated during learning as an assignment grade (weight 30%) Participation grades are given based on the criteria of student activity, student presence and integrity students (Weight 20%) Portfolio assessment is carried out at the end of lecture activities in the form of a student show up as an assignment grade (Weight 30%) **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Information discussions, lectures, assignments, e-learning 2 X 50			5%
10	Students can explain direct and indirect evidence that shows evolutionary phenomena in nature	1) Think scientifically (scientific literacy) in understanding the evidence for evolution (Genetics and Molecular Biology as evidence of evolution) 2) Explain genetics as evidence for evolution 3) Apply genetics to prove the evolution of living things 4) Explain molecular biology as evidence for evolution 5) Apply molecular biology to prove the evolution of living things.	**Criteria:** The written test is carried out during USS (weight 20%) and US (weight 30%) of the final grade. Paper and pencil performance is carried out integrated during learning as an assignment grade (weight 30%) Participation grades are given based on the criteria of student activity, student presence and integrity students (Weight 20%) Portfolio assessment is carried out at the end of lecture activities in the form of a student show up as an assignment grade (Weight 30%) **Form of Assessment** : Project Results Assessment / Product Assessment	Information discussions, lectures, assignments, e-learning 2 X 50			5%

11	Students can explain the mechanisms of evolution to understand phenomena that exist in nature	1) Scientific thinking (scientific literacy) in understanding the mechanisms of evolution 2) Explaining the process of the emergence of species (speciation) 3) Explaining types of evolution (microevolution and macroevolution)	**Criteria:** The written test is carried out during USS (weight 20%) and US (weight 30%) of the final grade. Paper and pencil performance is carried out integrated during learning as an assignment grade (weight 30%) Participation grades are given based on the criteria of student activity, student presence and integrity students (Weight 20%) Portfolio assessment is carried out at the end of lecture activities in the form of a student show up as an assignment grade (Weight 30%) **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Information discussions, lectures, assignments, e-learning 2 X 50			2%
12	Students can explain the mechanisms of evolution to understand phenomena that exist in nature	1) Think scientifically (scientific literacy) in understanding the mechanisms of evolution (Genetic drift and Gene flow) 2) Explain the meaning of genetic drift 3) Explain the meaning of gene flow 4) Explain the mechanism of genetic drift which drives the biological evolution of living creatures 6) Explain the mechanism of gene flow which drives the biological evolution of living things.	**Criteria:** The written test is carried out during USS (weight 20%) and US (weight 30%) of the final grade. Paper and pencil performance is carried out integrated during learning as an assignment grade (weight 30%) Participation grades are given based on the criteria of student activity, student presence and integrity students (Weight 20%) Portfolio assessment is carried out at the end of lecture activities in the form of a student show up as an assignment grade (Weight 30%) **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Information discussions, lectures, assignments, e-learning 2 X 50			3%

13	Students can explain the mechanisms of evolution to understand phenomena that exist in nature	1) Scientific thinking (scientific literacy) in understanding the mechanisms of evolution (Mutation, Descent, Coevolution) 2) Explaining the meaning of Mutation 3) Explaining the meaning of Descent 4) Explaining the meaning of Coevolution 5) Explaining the mutation mechanism that drives the biological evolution of living creatures 6) Explaining the mechanism Descent which drives the biological evolution of living creatures. 7) Explain the Coevolution mechanism which drives the biological evolution of living creatures.	**Criteria:** The written test is carried out during USS (weight 20%) and US (weight 30%) of the final grade. Paper and pencil performance is carried out integrated during learning as an assignment grade (weight 30%) Participation grades are given based on the criteria of student activity, student presence and integrity students (Weight 20%) Portfolio assessment is carried out at the end of lecture activities in the form of a student show up as an assignment grade (Weight 30%) **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Information discussions, lectures, assignments, e-learning 2 X 50			2%
14	Students can understand the process of human evolution with various theories that explain it.	1) Scientific thinking (scientific literacy) in understanding human evolution 2) Explaining the evolutionary evidence that supports human evolution 3) Analyzing the evidence that can support human biological evolution	**Criteria:** The written test is carried out during USS (weight 20%) and US (weight 30%) of the final grade. Paper and pencil performance is carried out integrated during learning as an assignment grade (weight 30%) Participation grades are given based on the criteria of student activity, student presence and integrity students (Weight 20%) Portfolio assessment is carried out at the end of lecture activities in the form of a student show up as an assignment grade (Weight 30%) **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Information discussions, lectures, assignments, e-learning 2 X 50			2%

15	Students can understand the process of human evolution with various theories that explain it.	1) Scientific thinking (scientific literacy) in understanding human evolution 2) Comparing profiles of ancient humans 3) Explaining evidence of human anatomy that supports human evolution 4) Evaluating various human evolutionary genealogies 5) Arranging human evolutionary genealogies from the most primitive to the modern.	**Criteria:** The written test is carried out during USS (weight 20%) and US (weight 30%) of the final grade. Paper and pencil performance is carried out integrated during learning as an assignment grade (weight 30%) Participation grades are given based on the criteria of student activity, student presence and integrity students (Weight 20%) Portfolio assessment is carried out at the end of lecture activities in the form of a student show up as an assignment grade (Weight 30%) **Form of Assessment** : Project Results Assessment / Product Assessment	Information discussions, lectures, assignments, e-learning 2 X 50			5%
16			**Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment, Tests	Final exams -	2x50	**Material:** - **Library:**	10%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	24.67%
2.	Project Results Assessment / Product Assessment	52.67%
3.	Portfolio Assessment	15.17%
4.	Practical Assessment	5%
5.	Test	2.5%
		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.