



Universitas Negeri Surabaya
Faculty of Mathematics and Natural Sciences
Master of Science Education Study Program

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date																																																																																																														
Science Study 2	8410102207		T=2	P=0	ECTS=4.48	2	February 4, 2024																																																																																																														
AUTHORIZATION	SP Developer		Course Cluster Coordinator			Study Program Coordinator																																																																																																															
	Dr. Z. A. Imam Supardi, M.Si dan Dr. Raharjo, M.Si		Dr. Z. A. Imam Supardi, M.Si dan Dr. Raharjo, M.Si			Dr. Eko Hariyono, S.Pd., M.Pd.																																																																																																															
Learning model	Case Studies																																																																																																																				
Program Learning Outcomes (PLO)	PLO study program that is charged to the course																																																																																																																				
	PLO-2	Demonstrate the character of being tough, collaborative, adaptive, innovative, inclusive, lifelong learning and entrepreneurial spirit																																																																																																																			
	PLO-3	Develop logical, critical, systematic and creative thinking in carrying out specific work in their field of expertise and in accordance with work competency standards in the field concerned																																																																																																																			
	PLO-4	Develop yourself continuously and collaborate.																																																																																																																			
	Program Objectives (PO)																																																																																																																				
	PO - 1	Able to develop knowledge and technology in the field of Science Education through research to produce innovative and tested work																																																																																																																			
	PO - 2	Able to manage research and development by applying educational concepts that can be used for society and science that is recognized nationally and internationally																																																																																																																			
	PO - 3	Able to develop logical, critical and systematic thinking and be able to apply it in making recommendations for research design tailored to the research topic to produce appropriate data analysis based on scientific rules, procedures and ethics																																																																																																																			
	PO - 4	Able to demonstrate a responsible attitude in completing Science Study assignments and applying science education concepts.																																																																																																																			
	PLO-PO Matrix																																																																																																																				
		<table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <thead> <tr> <th>P.O</th> <th>PLO-2</th> <th>PLO-3</th> <th colspan="4">PLO-4</th> </tr> </thead> <tbody> <tr> <td>PO-1</td> <td>✓</td> <td></td> <td colspan="4"></td> </tr> <tr> <td>PO-2</td> <td>✓</td> <td></td> <td colspan="4"></td> </tr> <tr> <td>PO-3</td> <td></td> <td>✓</td> <td colspan="4"></td> </tr> <tr> <td>PO-4</td> <td></td> <td></td> <td></td> <td colspan="3">✓</td> </tr> </tbody> </table>						P.O	PLO-2	PLO-3	PLO-4				PO-1	✓						PO-2	✓						PO-3		✓					PO-4				✓																																																																													
	P.O	PLO-2	PLO-3	PLO-4																																																																																																																	
	PO-1	✓																																																																																																																			
	PO-2	✓																																																																																																																			
	PO-3		✓																																																																																																																		
PO-4				✓																																																																																																																	
PO Matrix at the end of each learning stage (Sub-PO)																																																																																																																					
	<table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">P.O</th> <th colspan="16">Week</th> </tr> <tr> <th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th><th>11</th><th>12</th><th>13</th><th>14</th><th>15</th><th>16</th> </tr> </thead> <tbody> <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> <tr> <td>PO-2</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> <tr> <td>PO-3</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> <tr> <td>PO-4</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> </tbody> </table>																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																
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	This course examines the concepts, principles, roles, functions, physico-chemical rules that support the life of living things; includes the processes of movement, homeostasis, coordination, transportation, and cell transport. Lectures are presented in theory and assignments																																																																																																																				
References	Main :																																																																																																																				

1. Anderson, Smith, Richard W. Hill, Gordon A. Wyse, 2012, Animal Physiology, CollegevSinauer Associates, Inc. Publishers.
2. Andrey B. Rubin 2014, Fundamentals of Biophysics, New York, Co-published by John Wiley & Sons.
3. Davidovits, Paul 2016, Physics in Biology Physics in Biology and Medicine, New York, Library of Congress Cataloging-in-Publication Data
4. Dillon, Patrick, 2012. Biophysics A Physiological Approach, Michigan, Michigan State University Press
5. Goldfarb, Daniel, 2011, Biophysics, New York Mc Graw Hill

Supporters:

Supporting lecturer Dr. Zainul Arifin Imam Supardi, M.Si.
Dr. Raharjo, 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	Understanding the Movement of Living Things	1.Explain the meaning of Motion according to Physics 2.Explain the meaning of Movement according to Biology 3.Explain the principles underlying the process of creature movement	Criteria: Participative and contributive performance Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	Explaining RPS Discussing movement terms based on reference books and lecturer presentations 2 x 50 minutes	PPT 01 About the Movement of Creatures 2 x 50 minutes	Material: Creature Movement Bibliography: <i>Anderson, Smith, Richard W. Hill, Gordon A. Wyse, 2012, Animal Physiology, CollegevSinauer Associates, Inc. Publishers.</i>	0%
2			Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	2 x 50 minute offline presentations and discussions			0%
3							0%
4							0%
5							0%
6							0%
7							0%
8							0%
9							0%
10							0%
11							0%
12							0%
13							0%
14							0%
15							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** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities 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.**