



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

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date																																	
Movement and Change	8420103053		T=3	P=0	ECTS=4.77	3	July 19, 2024																																	
AUTHORIZATION		SP Developer		Course Cluster Coordinator		Study Program Coordinator																																		
			Prof. Dr. Erman, M.Pd.																																		
Learning model	Case Studies																																							
Program Learning Outcomes (PLO)	PLO study program that is charged to the course																																							
	Program Objectives (PO)																																							
	PLO-PO Matrix																																							
		P.O																																						
Short Course Description	This course discusses the study of the movement of living things in terms of physics, biology and chemistry; forms of movement, physical characteristics of movement and changes in the movement of objects due to force, growth and development of living things in phylogenetic terms, as well as chemical energy that influences the process of movement in living things in the form of theory and practice. Learning is delivered through presentations, discussions and practicums.																																							
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2" style="width: 10%; text-align: center;">P.O</td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 5%;"></td> <td style="width: 5%;">1</td> <td style="width: 5%;">2</td> <td style="width: 5%;">3</td> <td style="width: 5%;">4</td> <td style="width: 5%;">5</td> <td style="width: 5%;">6</td> <td style="width: 5%;">7</td> <td style="width: 5%;">8</td> <td style="width: 5%;">9</td> <td style="width: 5%;">10</td> <td style="width: 5%;">11</td> <td style="width: 5%;">12</td> <td style="width: 5%;">13</td> <td style="width: 5%;">14</td> <td style="width: 5%;">15</td> <td style="width: 5%;">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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Supporting lecturer	Dra. Martini, M.Pd. Dr. Elok Sudibyo, S.Pd., M.Pd. Dhita Ayu Permata Sari, 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							0%																																	

2	Utilizing ICT-based learning resources and learning media to understand linear motion kinetics and its application in everyday life.	<ol style="list-style-type: none"> 1.Explain Newton's first law, second law, and third law of motion. 2.Apply Newton's second law to determine the acceleration of an object or the resultant force acting on an object 3.Explain the relationship between impulse and momentum 	Criteria: Rubrics adjusted to the weight of the questions	Student-centered learning approach. Learning method is deductive. Strategy: Lectures, discussions and presentations. 3 X 50			0%
3	Utilizing ICT-based learning resources and learning media to understand the kinematics of angular motion and its application in everyday life.	<ol style="list-style-type: none"> 1.Distinguish between absolute and relative angular position 2.Explain the relationship between linear speed and angular speed 3.Explain the relationship between tangential acceleration and angular acceleration 4.Explain the relationship between centripetal acceleration and angular speed and tangential speed 	Criteria: Rubrics adjusted to the weight of the questions	Student-centered learning approach. Learning method is deductive. Strategy: Lectures, discussions and presentations. 3 X 50			0%
4	Utilizing ICT-based learning resources and learning media to understand the kinetics of angular motion and its application in everyday life.	<ol style="list-style-type: none"> 1.Explain how the moment of inertia of the human body can be manipulated 2.Explain the application of Newton's laws I, II, and III to angular motion 3.Explain the relationship between angular impulse and angular momentum 	Criteria: Rubrics adjusted to the weight of the questions	Student-centered learning approach (student-centered learning) Deductive learning method Strategy: Lecture, discussion, presentation 3 X 50			0%
5			Criteria: Rubrics adjusted to the weight of the questions	3 X 50			0%

6	Utilize ICT-based learning resources and learning media to understand plant movement and its application in everyday life	<ol style="list-style-type: none"> 1.Explain the meaning of movement in plants 2.Distinguish between spontaneous movement and movement influenced by stimuli 3.Describe three factors that influence movement in plants 4.Describe the process by which movement occurs in plants 	Criteria: Rubrics adjusted to the weight of the questions	Student-centered learning approach (student-centered learning) Deductive learning method Strategy: Lectures, discussions and presentations 3 X 50		0%
7	Utilize ICT-based learning resources and learning media to understand animal/human movement and its application in everyday life	<ol style="list-style-type: none"> 1.Distinguish between various types of movement in animals/humans 2.Describe the passive movement system in animals/humans 3.Distinguish between three types of muscles in the active movement system of animals/humans 4.Describe the molecular components of sarcomeres 5.Describe the role of three proteins in muscle contraction 	Criteria: Rubrics adjusted to the weight of the questions	Student-centered learning approach (student-centered learning) Deductive learning method Strategy: Lecture, discussion, presentation 3 X 50		0%
8	Utilize ICT-based learning resources and learning media to understand the muscular system and its application in everyday life	<ol style="list-style-type: none"> 1.Explain the innervation of skeletal muscles 2.Describe the work of skeletal muscles 3.Explain muscle stimulation 4.Describes the intensity of the stimulus 	Criteria: Rubrics adjusted to the weight of the questions	Student-centered learning approach (student-centered learning) Deductive learning method Strategy: Lecture, discussion, presentation 3 X 50		0%
9	Utilize ICT-based learning resources and learning media to understand the skeletal system and its application in everyday life	<ol style="list-style-type: none"> 1.Explain the function of bones 2.Distinguish between various types of joints 3.Distinguish between various types of movement 	Criteria: Rubrics adjusted to the weight of the questions	Student-centered learning approach (student-centered learning) Deductive learning method Strategy: Lecture, discussion, presentation 3 X 50		0%
10			Criteria: Rubrics adjusted to the weight of the questions	3 X 50		0%

11	Utilizing ICT-based learning resources and learning media to understand the process of ATP formation in the electron transport chain.	1.Explain the process by which ATP occurs in the electron transport chain. 2.Explain the process of ATP resynthesis known as the energy system.	Criteria: Rubrics adjusted to the weight of the questions	Student-centered learning approach (student-centered learning) Deductive learning method Strategy: Lecture, discussion, presentation 3 X 50			0%
12	Utilizing ICT-based learning resources and learning media to understand the muscle energy system (aerobic and anaerobic).	Explain the anaerobic energy system.	Criteria: Rubrics adjusted to the weight of the questions	Student-centered learning approach (student-centered learning) Deductive learning method Strategy: Lecture, discussion, presentation 3 X 50			0%
13	Utilizing ICT-based learning resources and learning media to understand the muscle energy system (aerobic and anaerobic).	Explain the aerobic energy system.	Criteria: Rubrics adjusted to the weight of the questions	Student-centered learning approach (student-centered learning) Deductive learning method Strategy: Lecture, discussion, presentation 3 X 50			0%
14	Utilizing ICT-based learning resources and learning media to understand the muscle energy system (aerobic and anaerobic) and its application in everyday life	Distinguish between three types of muscle energy systems in terms of fuel source, ATP production rate, amount of ATP production, and main function.	Criteria: Rubrics adjusted to the weight of the questions	Student-centered learning approach (student-centered learning) Deductive learning method Strategy: Lecture, discussion, presentation 3 X 50			0%
15	Utilizing ICT-based learning resources and learning media to understand metabolic adaptation (aerobic and anaerobic) and its application in everyday life	1.Explain adaptation and training of the aerobic system. 2.Explains adaptation and training of the anaerobic system.	Criteria: Rubrics adjusted to the weight of the questions	Student-centered learning approach (student-centered learning) Deductive learning method Strategy: Lecture, discussion, presentation 3 X 50			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.