




PLANT MORPHOLOGY LESSON PLAN

	MINISTRY OF EDUCATION, CULTURE, RESEARCH, AND TECHNOLOGY MULAWARMAN UNIVERSITY FACULTY OF TEACHER TRAINING AND EDUCATION BIOLOGY EDUCATION STUDY PROGRAM	No. Doc.	2.7
		Release Date	July 6th, 2020
		No Revision	3
		Page	16

LESSON PLAN					
Courses	Course Code	Clusters of Courses	Weight (credit)	Semester	Date Compilation
Plant Morphology Authorization	19050163W008	Course Offered by Study Program	3	2	March 1, 2020
	Course Coordinator	TEAM Teaching Courses		Coordinator of Study Program	
	 Dr. Hj. Herliani, M.Pd.	1. Dr. Hj. Herliani, M.Pd 2. Dr. Elsy Theodora Masaawet, M.Pd 3. Dr. Vandalita MM Rambitan, MP 4. Dr. Evie Palanewen, M.Pd		 Dr. Hj. Herliani, M.Pd.	
	Learning Outcomes of Study Program Graduates (LO-Study Program) Charged on Courses				
Learning Outcomes	Attitude	A2 : Collaborate and take responsibility for work in their fields of biology and learning.			
	Knowledge	K1 : Able to master basic theories, concepts, principles and procedures in the scientific field of biology and the interaction of organisms with Tropical Rain Forest and its Environment.			
	Specific Skills	SS1 : Able to master work skills and laboratory management by utilizing science and technology and available natural resources			
	Course Learning Outcomes (CLO)				

	<ol style="list-style-type: none"> 1. Able to demonstrate a collaborate and take responsible for work attending plant morphology 2. Able to master basic theories, concepts, principles and procedures in the field of plant morphology 3. Able to master work skills in the field of plant morphology by utilizing science and technology 				
Integrated Unmul PIP	<p>1.4. PLANT BIODIVERSITY: Contains various kinds of plants in tropical forest areas as timber, food and fruit plants, herbal plants, and others that have potentially developed. Can be added with various pests and plant diseases typical of tropical rainforests:</p> <ol style="list-style-type: none"> 1. Biodiversity of plants in tropical rain forest areas 2. Types or types of plants in the tropical rain forest and their characteristics 3. The benefits of various kinds and types of plants in tropical rain forest areas 				
Course Description	This course examines and analyzes the morphological structure of plants. Beginning with an explanation of the definition of plant morphology, cormus and parts thereof, nutrient apparatus (organum nutritivum) consisting of leaves (folium), stems (caulis), roots (radix), and other parts of plants, metamorphosis of roots, stems, and leaves; Reproductive organs (organum reproductivum) include flowers (flos), fruit (fructus), and seeds (cement); application of morphology and its terms in indentifiying plants morphology				
Reference	<ol style="list-style-type: none"> 1. Bell, AD 1991. Plant Form. Oxford: Oxford University Press. 2. King Tjitrosoepomo. 2007. Plant Morphology. Yogyakarta: Gadjah Mada University Press. 3. Hardjosuwarno, S & Wiryohardjo, S. 1979. Practical Instructions for Plant Morphology. Laboratory of Plant Taxonomy, Faculty of Biology UGM, Yogyakarta. 4. Lawrence, GHM 1959. Taxonomy of Vascular Plants. The Macmillan Company, New York. 5. Hartman, HT & DE Kester. 1983. Plant Propagation: Principles and Practices. New Jersey: 4th edition. French-Hall Inc. Engle Wood Cliffs. 6. References from journals that match the subject matter. 				
Learning Media	<table border="1" style="width:100%"> <tr> <th style="text-align:center">Software :</th> <th style="text-align:center">Hardware :</th> </tr> <tr> <td>Power Point, Camtasia, Macromedia Flash Program</td> <td>LCD and reference</td> </tr> </table>	Software :	Hardware :	Power Point, Camtasia, Macromedia Flash Program	LCD and reference
Software :	Hardware :				
Power Point, Camtasia, Macromedia Flash Program	LCD and reference				
Prerequisite Courses (If any)	General Biology minimum grade C				

Weeks	CLO	Indicator	Study Material	Learning Strategies (Models and Methods)	Student Learning Experience	Rating			Reference
						Type	Criteria	Weight (%)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1		a. Tuition Contract b. Explain the	✓ Preliminary ✓ Definition of Plant Morphology.	Direct learning strategy, presentation, discussion,	Paying attention to the lecturer's explanation regarding the RPS, discussions &	Process	Activeness, Performance, Presence		2, 4

		meaning of plant morphology. c. Explain cormus plants and their parts.	✓ Kormus and its Parts	question and answer	questions and answers classically discuss; Lecture Contract, Understanding Plant Morphology, Cormus and its Parts				
2		a. Explain the function of nutrients in plants. b. Describe the parts of a leaf (leaf sheath, petiole, Leaf Blade) based on their structure.	Nutrients (Organum nutritivum): Leaf: ● Leaf Parts: Leaf sheath, Petiole, Leaf Blade	Student Team Achievement Division (STAD) learning strategies, discussions, questions and answers	Paying attention to the lecturer's explanation and reviewing textbooks in groups about; Nutrient Tools (Organum nutritivum) Leaves: Leaf Parts, Leaf Sheath, Petiole, and Leaf Blade.	Process			1, 2, 3, 4, 5
3		a. Describing the parts of a leaf (leaf shape/shape, leaf tip, leaf base, leaf bone arrangement, leaf margin, leaf flesh, other properties of leaves, leaf color, leaf surface) based on their structure.	● Leaf Shape: Leaf Tip, Leaf Base, Leaf Bone Arrangement, Leaf Edge, Leaf Flesh, Other Characteristics of Leaves, Leaf Color, Leaf Surface.	Think Pair Share learning strategy, presentation, discussion, question and answer	Paying attention to lecturers' explanations and reviewing textbooks independently and in groups, discussing & asking questions to discuss; leaf parts (leaf structure/shape, leaf tip, leaf base, leaf bone arrangement, leaf margin, leaf flesh, other characteristics of leaves, leaf color, leaf surface).	Process			1, 2, 3, 4, 5
4		a. Distinguish between single	● Compound Leaves: Pinnate	Think Pair Share (TPS) learning	Paying attention to the lecturer's	Process			1, 2, 3, 4, 5

		<p>and compound leaves</p> <p>b. Describe the characteristics of compound leaves.</p> <p>c. Describe the structure of compound leaves (pinning, fingering, and mixed)</p>	<p>Compound Leaves, Finger Compound Leaves, Mixed Compound Leaves</p>	<p>strategies, presentations, discussions, questions and answers.</p>	<p>explanation and reviewing textbooks independently, and in groups, discussing & asking questions about; Compound Leaves (Finting, Fingering, Mixed)</p>				
5		<p>a. Describe the arrangement of leaves in plants</p> <p>b. Draw charts/schemas and diagrams of leaf layout in plants.</p> <p>c. Describe the spirochete and parasitic processes.</p>	<p>● Leaf Layouts, Charts (Schematics) and Leaf Layout Diagrams, Spirostatics and Parastatics</p>	<p>Think, Pair Share (TPS) learning strategy, presentation, discussion, question and answer</p>	<p>Paying attention to lecturers' explanations and reviewing textbooks independently and in groups, discussing & asking questions to discuss; Leaf Layouts, Charts (Schematics), and Leaf Layout Diagrams, Spirostatics and Parastatics.</p>	Process			1, 2, 3, 4, 5
6		<p>a. Describe the properties of stems.</p> <p>b. Explain the function of stems in plants</p> <p>c. Distinguish between non-</p>	<p>● Stem: Stem Shape, Stem Growing Direction, Branching on Stem</p>	<p>Think Pair Share (TPS) learning strategy, presentation, discussion, question and answer</p>	<p>Paying attention to the lecturer's explanation and reviewing textbooks independently, and in groups, discussing & asking questions about; Stem (Stem Shape,</p>	Process			1, 2, 3, 4, 5

		<p>trunked and clear-trunked plants</p> <p>d. Distinguishing different types of stems</p> <p>e. Distinguishing the various directions of stem growth</p> <p>f. Distinguishing branching in stems based on their structure</p>			Stem Growing Direction, Branching on Stem)				
7		<p>a. Describe the characteristics of plant roots</p> <p>b. Explain the function of roots in plants</p> <p>c. Describe the parts of a plant root</p> <p>d. Distinguish between root systems in plants based on their structure</p> <p>e. Explain the special properties and functions of roots based on the plant's way of life</p>	<ul style="list-style-type: none"> ● Root ● Other Parts of Plants ● Metamorphosis of Roots, Stems and Leaves 	Student Team Achievement Division (STAD) learning strategies, discussions, questions and answers	Pay attention to the lecturer's explanation and discussion & question and answer discuss; Roots, Other Parts of Plants, Metamorphosis of Roots, Stems, Leaves.	Process			1, 2, 3, 4, 5

		f. Explain other parts of plants which are metamorphosis of roots, stems and leaves							
8	Mid-Semester Exam								
9		<p>a. Describe the 2 (two) groups of plant reproductive organs</p> <p>b. Give examples of plants that can reproduce naturally and artificially</p> <p>c. Distinguishing flowers based on the location and arrangement of the parts.</p> <p>d. Distinguish between single-flowered and multi-flowered plants</p> <p>e. Distinguishing flowers based on their location and based on their number on a plant.</p>	<p>Reproductive Organs (Organum reproductivum):</p> <ul style="list-style-type: none"> ● Flowers: Number of Flowers and Their Layout on a Plant, ● Compound Flowers: Infinite Compound Flowers, Boundary Compound Flowers, Mixed Compound Flowers, Other Compound Flower Types 	<p>Think Pair Share (TPS) learning strategy, discussion, question and answer</p>	<p>Paying attention to the lecturer's explanation and reviewing textbooks in groups about; Reproductive Equipment (Organum reproductivum):</p> <p>Flowers: Number of Flowers and Their Layout on a Plant, Compound Flowers, Infinite Compound Flowers, Boundary Compound Flowers, Mixed Compound Flowers, Other Types of Compound Flowers</p>	<p>Process</p>			<p>1, 2, 3, 4, 5</p>

		<p>f. Distinguishing compound flowers based on the parts that are like stems or branches and which are like leaves.</p> <p>g. Distinguishing unlimited, limited, mixed, and other types of compound flowers.</p>							
10		<p>a. Describe the parts of a flower based on their structure.</p> <p>b. Distinguishing complete and incomplete flowers</p> <p>c. Distinguishing flowers based on their reproductive organs</p> <p>d. Explain the difference between flowers based on the arrangement of the parts of the flower.</p>	<ul style="list-style-type: none"> ● Flower Parts: Reproductive morphology of Flowers, Division of Place Between Parts of One Flower with Another Part, Symmetry of Flowers, Location of Leaves in Buds, Flower Base, Flower Basic Shape. 	<p>Student Team Achievement Division (STAD) learning strategies, discussions, questions and answers</p>	<p>Pay attention to the lecturer's explanation, discussion & question and answer discuss; Flower Parts: Sex of Flowers, Division of Place Between Parts of One Flower with Another Part, Symmetry in Flowers, Location of Leaves in Buds, Flower Base, Flower Basic Shape</p>	<p>Process</p>			<p>1, 2, 3, 4, 5</p>

		<p>e. Distinguishing flowers based on flower symmetry.</p> <p>f. Distinguishing flowers based on where the leaves are in the bud</p> <p>g. Explain the difference between the basic parts of flowers in plants.</p> <p>Explain the various basic forms of flowers in plants</p>							
11		<p>a. Explain the differences in the nature of the petals on flowers, the differences in the nature of the petals on flowers, the meaning of flower tents, the classification of flower tents according to shape and color,</p>	<ul style="list-style-type: none"> ● Petals, flower crowns, flower tents, stamens, anthers. ● Pistils, ovules, pistil stalks, pistil heads, honey glands, pollination and fertilization 	<p>Think Pair Share (TPS) learning strategy, presentation, discussion, question and answer</p>	<p>Paying attention to the lecturer's explanations and reviewing textbooks independently and in groups, discussions & questions and answers about Petals, Flower Heads or Flower Crowns, Flower Tents, Stamens, Stamens, Essences, Pistils, Fruits, Seeds, Pistil stalks, pistil, honey gland, pollination or pollination, and</p>	<p>Process</p>			<p>1, 2, 3, 4, 5</p>

		<p>differences in the structure of the stamens in plants, classification of stamens according to their number in flowers, differences in the stamens based on number of attachment bundles, various anthers based on their seat on the stalk.</p> <p>b. Explain the structure of the pistil, the difference in the ovary, the structure of the ovary, the difference in the ovule, the structure of the stalk of the pistil, the difference in the honey glands, the pollination</p>			fertilization				
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		process, the difference in pollination.							
12		<p>a. Drawing flower diagram</p> <p>b. Making flower formula</p>	<ul style="list-style-type: none"> ● Flower Diagram, Flower Formula 	Student Team Achievement Division (STAD) learning strategies, discussion presentations, questions and answers	Pay attention to the lecturer's explanation, discussion & question and answer discuss; Interest Diagrams and Interest Formulas	Process			1, 2, 3, 4, 5
13		<p>a. Describe the parts of a flower that grow into a fruit.</p> <p>b. Distinguishing false fruit and true fruit</p> <p>c. Classify false fruit and true fruit along with examples of their fruit.</p> <p>d. Distinguishing a single true fruit which is dry and fleshy,</p> <p>e. Distinguish between double true fruit and compound fruit</p>	<ul style="list-style-type: none"> ● Fruit: Overview of Fruits, Pseudo-Fruit Division, True Fruits/True Fruits, Overview of Dried Single True Fruits, Overview of Single Flesh True Fruits, Multiple True Fruits, Compound True Fruits. 	Think Pair Share (TPS) learning strategy, presentation, discussion, question and answer	Paying attention to the lecturer's explanations and reviewing textbooks independently and in groups, discussions & questions and answers on Fruits: Overview of Fruits, Pseudo Fruit Distribution, Real Fruit Distribution/True Fruits, Overview of Dried Single True Fruits, Overview of Single Fleshy True Fruits, True Fruits Double, Compound True Fruit.	Process			1, 2, 3, 4, 5
14		<p>a. Describe the structure and</p>	<ul style="list-style-type: none"> ● Seed: Seed Shell, 	Student Team Achievement	Paying attention to the lecturer's explanation,	Process			1, 2, 3, 4, 5

		parts of seeds. b. Differentiate 2 (two) kinds of seed germination	Umbilical Cord, Seed Core, <i>Lembaga</i> , Sprout.	Division (STAD) learning strategies, discussion presentations, questions and answers	discussion & question and answer discussing Seeds: Seed Shell, Umbilical Cord, Seed Core, <i>Lembaga</i> , Sprout				
15		a. Compile a complete description of a plant species. b. Making herbarium	Application of Morphology and Its Terms in Identifying Plants Morphology	Student Team Achievement Division (STAD) learning strategies, discussion presentations, questions and answers	Paying attention to the lecturer's explanation, discussion & question and answer discussing the Application of Morphology and its Terms in Identifying Plants Morphology	Process	Activeness, Performance, Attendance, Performance Un		2, 3, 5
16	Final Semester Exam					Product	Essay		
Semester exams									

Samarinda, March 10th, 2020

Coordinator of Biology Education Study program



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