



**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
Phytogeography	4620102077	Study Program Elective Courses	T=2	P=0	ECTS=3.18	5	July 17, 2024
AUTHORIZATION	SP Developer		Course Cluster Coordinator			Study Program Coordinator	
	Dr. Wisanti. M.S; Dr. Novita Kartika Indah, S.Pd.,M.Si.		Dr. Wisanti, MS.			Dr. H. Sunu Kuntjoro, S.Si., M.Si.	

Learning model	Project Based Learning
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Program Learning Outcomes (PLO)	<b>PLO study program that is charged to the course</b>																																																																																																																				
	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-7	Able to work independently and collaboratively, as well as responsibly, in completing various tasks in class, in the laboratory and in the field.																																																																																																																			
	PLO-12	Able to demonstrate basic knowledge of biology relevant to science and mathematics to understand current scientific phenomena and issues and apply them in problem solving																																																																																																																			
	<b>Program Objectives (PO)</b>																																																																																																																				
	PO - 1	Able to apply transferable skills to develop eco-commitment																																																																																																																			
	PO - 2	Able to act independently and work together while studying plant distribution studies																																																																																																																			
	PO - 3	Mastering the concept of phytogeography to solve plant distribution problems in Indonesia																																																																																																																			
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	<b>PLO-PO Matrix</b>																																																																																																																				
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<b>PO Matrix at the end of each learning stage (Sub-PO)</b>																																																																																																																					
	<table border="1" style="margin-left: auto; margin-right: auto;"> <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																
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Short Course Description	This course discusses the meaning, function and role of biogeography in relation to geological history; geographic distribution of plant species and ecosystem diversity over geological timescales; modern biogeography; distribution of natural plants and cultivated plants; plant strategy and dispersal; flora malesiana; Indonesian floristics; moss biogeography; biogeography of ferns and biogeography of gymnosperms. Lectures are delivered through discussions, presentations and project assignments
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References	Main :	
		<ol style="list-style-type: none"> <li>Craine, J.M., 2007. Plant strategy theories: replies to Grime and Tilman. Journal of Ecology 95: 235-240.</li> <li>Polunin, N. 1990. Pengantar Geografi Tumbuhan dan Beberapa Ilmu Serumpun . Yogyakarta: Gadjah Mada Unipress.</li> <li>Wisanti, Fida R., Novita K.I., Eva K. P.,2021. Fitogeografi. Surabaya: Unesa Press.</li> </ol>
	Supporters:	

1. Pielou, E.C. 1924. Biogeography. New York: A Wiley-Interscience Publication John Wiley & Sons.
2. Grime, J.P. 1979. Plant Strategies & Vegetation Processes. New York: A Wiley-Interscience Publication John Wiley & Sons
3. Kusmana, C., Hikmat, A. 2015. Keanekaragaman Hayati Flora di Indonesia. Jurnal Pengelolaan SDA dan Lingkungan 5(2): 187-198.
4. Briggs, J.C. 1988. Biogeography and Plate Tectonics . New York: Elsevier.
5. Wilson, M.F. & Traveset, A., 2000. Seeds: The Ecology of Regeneration in Plant Communities: 2nd Edition : CAB International: USA

**Supporting lecturer**  
 Dr. Wisanti, M.S.  
 Prof. Dr. Fida Rachmadiarti, M.Kes.  
 Dr. Novita Kartika Indah, S.Pd., M.Si.  
 Eva Kristinawati Putri, S.Pd., 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	Understand key concepts about the history of biogeography and basic principles of biogeography	<ol style="list-style-type: none"> <li>1.Explain the history of geology in relation to phytogeography</li> <li>2.Explains the main approaches to biogeography: ecology, history and conservation</li> <li>3.Explain factors related to the main principles of phytogeography</li> <li>4.Explain that biogeography is a synthetic science</li> <li>5.Define the components of historical biogeography and ecological biogeography</li> <li>6.Determine the aspects that influenced the development of the bigeographic revolution of the 20th century</li> </ol>	<p><b>Criteria:</b> Quantitative (C2 and C3)</p> <p><b>Forms of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment</p>	Lecture and question and answer 2 X 50		<p><b>Material:</b> Scope of phytogeography  <b>References:</b>  <i>Wisanti, Fida R., Novita KI, Eva KP, 2021. Phytogeography. Surabaya: Unesa Press.</i></p> <hr/> <p><b>Material:</b> Geological history and distribution of plants  <b>References:</b>  <i>Briggs, JC 1988. Biogeography and Plate Tectonics. New York: Elsevier.</i></p>	10%

2	Understand dispersal types and their relationship to plant migration	<ol style="list-style-type: none"> <li>1. Explain the comparison of long distance dispersal with vicarians as a discontinuous distribution mechanism</li> <li>2. Explains the cause of vicariance based on the Darwin-Wallace opinion</li> <li>3. Explain the factors that play a role when plants expand their range through dispersal</li> <li>4. Determine the type of plant dispersal</li> <li>5. Analyzing the types of dispersal routes of Asiatic flora genera found in the mountainous areas of the Sunda shelf, especially in Sumatra and Java but not on the Malay peninsula.</li> <li>6. Distinguish three types of deployment routes: corridor, filter and betting routes.</li> </ol>	<p><b>Criteria:</b> Quantitative (C2 and C3); test</p> <p><b>Form of Assessment :</b> Project Results Assessment / Product Assessment</p>	Lectures and discussions 2 X 50		<p><b>Material:</b> Dispersal and migration of plants</p> <p><b>References:</b> <i>Wisanti, Fida R., Novita KI, Eva KP, 2021. Phytogeography. Surabaya: Unesa Press.</i></p> <hr/> <p><b>Material:</b> Plant dispersal</p> <p><b>Reference:</b> <i>Polunin, N. 1990. Introduction to Plant Geography and Some Allergen Sciences. Yogyakarta: Gadjah Mada Unipress.</i></p>	5%
3	Able to analyze the types of plant distribution in the surrounding environment	<ol style="list-style-type: none"> <li>1. Explain the importance of seed dispersal</li> <li>2. Explain the relationship between seed dispersal and animal communities</li> <li>3. Explain the effect of seed dispersal on colonization and plant community structure</li> <li>4. Explain the effect of seed dispersal on population structure</li> <li>5. Explain the mechanism of seed dispersal</li> <li>6. Analyzing plant dispersal types in the environment through group collaboration</li> <li>7. Communicate the results of analysis of plant dispersal types in the environment in the form of a paper</li> </ol>	<p><b>Form of Assessment :</b> Project Results Assessment / Product Assessment</p>	Discussion and assignment 2 X 50		<p><b>Material:</b> Plant dispersal mechanisms and tools</p> <p><b>References:</b> <i>Wisanti, Fida R., Novita KI, Eva KP, 2021. Phytogeography. Surabaya: Unesa Press.</i></p> <hr/> <p><b>Material:</b> Plant dispersal</p> <p><b>Reference:</b> <i>Polunin, N. 1990. Introduction to Plant Geography and Some Allergen Sciences. Yogyakarta: Gadjah Mada Unipress.</i></p> <hr/> <p><b>Material:</b> Plant strategies</p> <p><b>References:</b> <i>Grime, JP 1979. Plant Strategies &amp; Vegetation Processes. New York: A Wiley-Interscience Publication John Wiley &amp; Sons</i></p>	5%

4	Understand plant strategies for survival	<ol style="list-style-type: none"> <li>1.Explain the definition of plant strategy</li> <li>2.Explain the types of plant strategies</li> <li>3.Provide examples for specific plant strategies</li> <li>4.Explain the relationship between strategy and plant stature</li> <li>5.Communicate the results of plant strategy analysis discussions verbally</li> </ol>	<p><b>Criteria:</b> Quantitative (C2 and C3); test and non-test</p> <p><b>Form of Assessment :</b> Project Results Assessment / Product Assessment</p>	presentation and question and answer 2 X 50		<p><b>Material:</b> Plant strategies <b>References:</b> <i>Wisanti, Fida R., Novita KI, Eva KP, 2021. Phytogeography. Surabaya: Unesa Press.</i></p> <p><b>Material:</b> Plant strategy <b>Reference:</b> <i>Craine, JM, 2007. Plant strategy theories: replies to Grime and Tilman. Journal of Ecology 95: 235-240.</i></p>	5%
5	Understand the role of environmental factors in characterizing plant distribution or habitat types	<ol style="list-style-type: none"> <li>1.Explain the climatic factors that play a role in forming plant distribution types</li> <li>2.Explain the physiography that plays a role in forming plant distribution types</li> <li>3.Explain the edaphic factors that play a role in forming distribution types</li> <li>4.Explain the biotic factors that play a role in forming plant distribution types</li> </ol>	<p><b>Criteria:</b> Quantitative (C2 and C3); test</p> <p><b>Forms of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment</p>	Lectures and questions and answers 2 X 50		<p><b>Material:</b> Environmental factors and plant distribution <b>References:</b> <i>Polunin, N. 1990. Introduction to Plant Geography and Some Allied Sciences. Yogyakarta: Gadjah Mada Unipress.</i></p>	10%
6	Analyze the importance of plant population distribution patterns	<ol style="list-style-type: none"> <li>1.Analyze plant distribution patterns with the environment</li> <li>2.Explain the categories of plant population distribution patterns</li> <li>3.Explain the causes of the emergence of plant population distribution patterns</li> <li>4.Determine the population distribution pattern of plant types around the campus</li> </ol>	<p><b>Forms of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment</p>	Assignment and discussion 2 X 50		<p><b>Material:</b> Distribution of plant populations <b>References:</b> <i>Polunin, N. 1990. Introduction to Plant Geography and Some Allied Sciences. Yogyakarta: Gadjah Mada Unipress.</i></p>	5%

7	Understand the types and areas of natural distribution	<ol style="list-style-type: none"> <li>1.Explain the boundaries of the natural distribution area of plants</li> <li>2.Explains 3 main phytogeographic patterns and describes significant plant genera</li> <li>3.Delimit endemic types by illustrating significant plant genera</li> <li>4.Explain the contrasting character traits of angiosperms that make this group so successful compared to other plant groups</li> <li>5.Can independently determine three families of primitive angiosperms and summarize distribution patterns through reference searches</li> </ol>	<b>Criteria:</b> Quantitative (C2 and C4); test and non-test  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Discussion and assignment 2 X 50		<b>Material:</b> types and natural distribution areas <b>References:</b> <i>Wisanti, Fida R., Novita KI, Eva KP, 2021. Phytogeography. Surabaya: Unesa Press.</i>	5%
8	MIDTERM EXAM	MIDTERM EXAM	<b>Criteria:</b> MIDTERM EXAM  <b>Form of Assessment :</b> Participatory Activities	MID SEMESTER EXAMINATION 2 X 50			10%
9	Understand the types and distribution areas of cultivated plants	<ol style="list-style-type: none"> <li>1.Explain the difference between paleoendemic and neoendemic</li> <li>2.Explain plant domestication techniques</li> <li>3.Presents the results of a comprehensive study of cultivated plant varieties in Indonesia related to domestication and types of distribution areas</li> </ol>	<b>Criteria:</b> Quantitative (C2 and C4); test and non-test  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Lectures and questions and answers 2 X 50		<b>Material:</b> Types and distribution areas of cultivated plants <b>References:</b> <i>Wisanti, Fida R., Novita KI, Eva KP, 2021. Phytogeography. Surabaya: Unesa Press.</i>	5%

10	Understand the flora of Malesiana with the characteristics of its endemic plants as well as the figures involved in dividing the Malaesiana flora zone	<ol style="list-style-type: none"> <li>1.Explaining the demarcation node boundaries of the Malaesiana flora</li> <li>2.Make a comparative table of the division of Malaesiana flora zones according to Merrill and Dickerson and (b) Van Steenis</li> <li>3.Explain why Asiatic elements do not dominate the Malaesiana region</li> <li>4.Explains the cause of the Asiatic genus of Sunda exposure, especially in Sumatra and Java but is not found on the Malay peninsula</li> </ol>	<p><b>Criteria:</b> Quantitative (C2 and C3); test</p> <p><b>Form of Assessment :</b> Participatory Activities</p>	Lectures and discussions 2 X 50		<p><b>Material:</b> Flora Malesiana <b>Bibliography:</b> <i>Wisanti, Fida R., Novita KI, Eva KP, 2021. Phytogeography. Surabaya: Unesa Press.</i></p>	5%
11	Understand Indonesian floristics and its regional divisions	<ol style="list-style-type: none"> <li>1.Comparing the diversity of each Indonesian floristic region.</li> <li>2.Comparing environmental factors that influence floristic areas in Indonesia</li> <li>3.Provide examples of endemic plant types in the Indonesian floristic region</li> </ol>	<p><b>Criteria:</b> Quantitative (C2 and C3); test</p> <p><b>Form of Assessment :</b> Project Results Assessment / Product Assessment</p>	Discussion; Biogeography project assignments for native Indonesian plant species (1st phase: determining plant objects) 2 X 50; independently outside of face-to-face lectures		<p><b>Material:</b> Indonesian Flora <b>Reference:</b> <i>Wisanti, Fida R., Novita KI, Eva KP, 2021. Phytogeography. Surabaya: Unesa Press.</i></p> <p><b>Material:</b> Indonesian Floristics <b>Reference:</b> <i>Kusmana, C., Hikmat, A. 2015. Flora Biodiversity in Indonesia. Journal of Natural Resources and Environmental Management 5(2): 187-198.</i></p>	5%
12	Understanding moss biogeography	<ol style="list-style-type: none"> <li>1.Explain the factors that influence moss dispersal</li> <li>2.Explains the reason that the geographic range of mosses is wider than that of vascular plants.</li> <li>3.Determine moss distribution patterns</li> <li>4.Describes three properties of Splachnaceae that illustrate aided dispersal by flies.</li> <li>5.Explain the factors that cause vicariads in mosses.</li> <li>6.Describes three conditions of bryoflora that are positively correlated with the endemic distribution of bryoflora</li> </ol>	<p><b>Criteria:</b> Quantitative (C2 and C3); test</p> <p><b>Form of Assessment :</b> Project Results Assessment / Product Assessment</p>	Lectures, questions and answers; Biogeography project tasks of native Indonesian plant species (2nd phase: determining project activity plan) 2 X 50; independently outside of face-to-face lectures		<p><b>Material:</b> Moss Biogeography <b>Reference:</b> <i>Wisanti, Fida R., Novita KI, Eva KP, 2021. Phytogeography. Surabaya: Unesa Press.</i></p>	5%

13	Understanding the biogeography of ferns	<ol style="list-style-type: none"> <li>1. explain the main patterns of distribution of ferns</li> <li>2. explain the role of dispersal in the distribution of ferns</li> <li>3. explains why the power of long-distance dispersal is higher in ferns than in seed plants</li> <li>4. describes the evidence supporting long-range dispersal of ferns</li> <li>5. provides an example of long-distance dispersal in ferns</li> <li>6. explains the reasons why vicariance in ferns is limited.</li> <li>7. describes the highest endemic areas of ferns confined to the mountains</li> <li>8. Explaining the spatial disjunction of gametophyte and sporophyte generations related to the expansion of the distribution area of ferns</li> <li>9. floristic region of ferns.</li> </ol>	<p><b>Criteria:</b> Quantitative (C2 and C3); test</p> <p><b>Form of Assessment :</b> Participatory Activities</p>	<p>Discussion; Biogeography project assignments for native Indonesian plant species (3rd phase: observing, documenting and reviewing references) 2 X 50; independently outside of face-to-face lectures</p>	<p><b>Material:</b> Biogeography of ferns</p> <p><b>Reference:</b> <i>Wisanti, Fida R., Novita KI, Eva KP, 2021. Phytogeography. Surabaya: Unesa Press.</i></p>	5%
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14	Understanding gymnosperm biogeography	<ol style="list-style-type: none"> <li>1. Distinguishing features of Angiosperms that have made them so successful in expanding their distribution area compared to other plant groups.</li> <li>2. Comparing dispersal tools from cycads, pine and melinjo.</li> <li>3. Summarizes the biogeographic patterns, diseminules, and dispersal modes of two primitive Angiosperm families.</li> <li>4. Comparing the distribution patterns of cycads, pines and gnetum</li> <li>5. Analyzing the influence of environmental factors on the distribution of <i>Pinus merkusii</i> in Southeast Asia</li> <li>6. Explaining the causes of the fragmentation of <i>P. merkusii</i> distribution in Sumatra and the Philippines.</li> <li>7. Explains why the <i>Gnetum</i> genus, which may have originated from South America, spread to West Africa and finally reached tropical and subtropical Asia</li> </ol>	<b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Discussion; Biogeography project assignments for native Indonesian plant species (4th phase: presenting report and preparing poster) 2 X 50; independent outside face to face		<b>Material:</b> Biogeography of gymnosperms <b>References:</b> <i>Wisanti, Fida R., Novita KI, Eva KP, 2021. Phytogeography. Surabaya: Unesa Press.</i>	5%
15	Able to communicate the results of local biodiversity investigations independently and honestly in class seminars	<ol style="list-style-type: none"> <li>1. Work together to create project assignment reports</li> <li>2. Present the results of project assignments independently and honestly in the form of seminars</li> </ol>	<b>Form of Assessment :</b> Participatory Activities	2 X 50 Seminars			5%
16			<b>Form of Assessment :</b> Participatory Activities	UAS			10%

**Evaluation Percentage Recap: Project Based Learning**

No	Evaluation	Percentage
1.	Participatory Activities	47.5%
2.	Project Results Assessment / Product Assessment	52.5%
		100%



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.