



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

Document Code

**SEMESTER LEARNING PLAN**

<b>Courses</b>	<b>CODE</b>	<b>Course Family</b>	<b>Credit Weight</b>			<b>SEMESTER</b>	<b>Compilation Date</b>
Pharmacognosy*	4620102066	Study Program Elective Courses	T=2	P=0	ECTS=3.18	5	October 21, 2023
<b>AUTHORIZATION</b>	<b>SP Developer</b>		<b>Course Cluster Coordinator</b>			<b>Study Program Coordinator</b>	
	.....		Dr. sc. agr. Yuni Sri Rahayu, M. Si.			Dr. H. Sunu Kuntjoro, S.Si., M.Si.	

**Learning model** Project Based Learning

<b>Program Learning Outcomes (PLO)</b>	<b>PLO study program that is charged to the course</b>																																																																	
	<b>PLO-6</b>	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.																																																																
	<b>PLO-13</b>	Able to demonstrate basic knowledge of cell and molecular biology, organismal biology, ecology and evolution to analyze current biological issues																																																																
	<b>Program Objectives (PO)</b>																																																																	
	<b>PO - 1</b>	CLO1 Master and apply pharmacognosy concepts such as secondary metabolites and understand the working principles, procedures and techniques for making simplicia, secondary metabolite extraction (CPL2). CLO2 Able to apply knowledge and technology in the field of pharmacognosy to solve natural resource and environmental problems both in the laboratory and in real practice that supports professions and/or entrepreneurship (CPL 3) CLO3 Make the right decisions based on analysis of information and data, and be able to provide guidance in choosing various alternative solutions independently and in groups in the field of pharmacognosy. (CPL 6) "CLO4 Able to work independently, responsibly, both as an individual and in a group, and able to work together. (CPL 9) CLO5 Has social sensitivity and care for society and the environment. (CPL 10)."																																																																
	<b>PLO-PO Matrix</b>																																																																	
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>P.O</td> <td>PLO-6</td> <td>PLO-13</td> </tr> <tr> <td>PO-1</td> <td></td> <td></td> </tr> </table>		P.O	PLO-6	PLO-13	PO-1																																																												
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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;"> <tr> <td rowspan="2">P.O</td> <td colspan="16">Week</td> </tr> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td> </tr> <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> </table>																P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	PO-1																
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**Short Course Description** Learn about ethnopharmaceuticals and their development; vegetable simplicia in terms of classification according to active ingredients and classification according to plant parts along with examples; manufacture, management, use and safety as well as analysis of vegetable simplicia, nutrition of natural ingredients which includes the meaning, benefits, safety and examples, as well as the application of vegetable ingredients for human health and welfare. Learning is delivered through presentations, discussions and practicums. Students' attitudes to be honest, work carefully, think creatively and critically are developed in this course.

**References**

**Main :**

- Evans, W.C., 2002. Pharmacognosy. London: English Language Book Society, Bailliere Tindall.
- Daniel, M. 2006. Medicinal Plants. Science Publishers Enfield (NH), Jersey, Plymouth
- Heyne, K. 1987. Tumbuhan Berguna Indonesia . Jakarta: Yayasan Sarana Warna Jaya
- Pengelly, A. 2004. The Constituent Of Medicinal Plants. Cabi Publishing, Cambridge, Ma 02139, USA.
- Ratnasari, E. dan Yuliani. 2014. Farmakognosi . Surabaya: University Press.
- Robberts, J.E., Tyler, V.E., and Brady, L.R., 1988. Pharmacognosy. Philadelphia: Lea & Febiger.
- Verpoorte, R. dan A. W. Alfermann. 2000. Metabolic engineering of plant secondary metabolism. Springer. ISBN 978-0-7923-6360-6. Page.1-3.

**Supporters:**

**Supporting lecturer** Dra. Evie Ratnasari, M.Si.  
 Prof. Dr. Yuni Sri Rahayu, M.Si.  
 Prof. Dr. Yuliani, M.Si.  
 Sari Kusuma Dewi, 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	Able to explain the scope of pharmacognosy studies and relate it to other fields of science	After attending the lecture, students are expected to be able to: 1. Explain the scope of pharmacognosy studies 2. Explain the position of pharmacognosy with other sciences	<b>Criteria:</b> 1.1. Attendance/Participation 20% 2.2. Practicum/Assignments 30% 3.3.USS 20% 4.4. US 30%  <b>Form of Assessment :</b> Participatory Activities	Presentation and discussion 2 X 50			5%
2	Able to explain secondary metabolites and functional applications of secondary metabolites	After attending the lecture, students are expected to be able to: 1. Explain secondary metabolism and its differences from primary metabolism 2. Explain the biochemical, physiological and ecological functions of secondary metabolites	<b>Criteria:</b> 1.1. Attendance/Participation 20% 2.2. Practicum/Assignments 30% 3.3.USS 20% 4.4. US 30%  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Presentation, discussion and reflection 2 X 50			5%
3	Able to analyze and present biosynthesis and various pathways of secondary metabolism	After attending the lecture, students are expected to be able to: 1. Analyze biosynthesis and secondary metabolite pathways 2. Present secondary metabolism and storage pathways in plants	<b>Criteria:</b> 1.1. Attendance/Participation 20% 2.2. Practicum/Assignments 30% 3.3.USS 20% 4.4. US 30%  <b>Form of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment	Presentation, discussion and reflection Presentation, discussion and reflection 2 X 50			10%
4	Students are able to explain and present the basic effects of poisonous/toxic plants and the substances that play a role	After attending the lecture, students are expected to be able to explain: 1. Acute and chronic toxicity due to exposure to plants 2. Types of plants - toxic substances produced, indications of poisoning and actions taken. 3. The role of plants in controlling nuisance creatures (pests, insects, molluscs, etc.)	<b>Criteria:</b> 1.1. Attendance/Participation 20% 2.2. Practicum/Assignments 30% 3.3. USS 20% 4.4. US 30%  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Presentation, discussion and reflection 2 X 50			5%
5	Able to carry out practical activities regarding the manufacture of simplicia and extraction	After attending the lecture, students are expected to be able to carry out practical activities on simplicia and extraction	<b>Criteria:</b> 1.1. Attendance/Participation 20% 2.2. Practicum/Assignments 30% 3.3. USS 20% 4.4. US 30%  <b>Form of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment	Practical presentation and discussion and preparation of 2 X 50 reports			10%
6	Able to analyze cases, propose theoretical theories, conduct experiments and present papers	After attending the lecture, students are expected to be able to: 1. Analyze cases that occur in society 2. Propose solutions to problem solving (theoretical and empirical theory) 3. Conduct experiments on the proposed hypotheses 4. Produce scientific papers based on experiments and literature studies with correct based on the rules of scientific writing	<b>Criteria:</b> 1.1. Attendance/Participation 20% 2.2. Practicum/Assignments 30% 3.3. USS 20% 4.4. US 30%  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Presentations, discussions, conducting experiments, and writing 2 X 50 papers			5%
7	Students are able to explain carbohydrates, glycosides from plants and their use in various fields.	After attending the lecture, students are expected to be able to explain carbohydrates, glycosides and the structure of glycosides, the chemical properties of glycosides and their use in the fields of medicine and ecology.	<b>Criteria:</b> 1.1. Attendance/Participation 20% 2. Practicum/Assignments 30% 3.3. USS 20% 4.4. US 30%  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Presentation and discussion, 2 X 50			5%

8	Meetings 1-7	Meetings 1-7	<b>Criteria:</b> 1.1. Attendance/Participation 20% 2. 2.Practicum/Assignments 30% 3.3. USS 20% 4.4. US 30%  <b>Form of Assessment :</b> Participatory Activities, Tests	Sub Summative Exam 2 X 50			10%
9	Students are able to explain essential compounds, alkaloids and steroids and their uses in various fields	After attending the lecture, students are expected to be able to explain essential compounds, alkaloids, steroids and their use in the fields of medicine and ecology.	<b>Criteria:</b> 1.1. Attendance/Participation 20% 2. 2.Practicum/Assignments 30% 3.3. USS 20% 4.4. US 30%  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Presentation and discussion 2 X 50			5%
10	Students are able to explain the biosynthesis and role of phenolic and flavonoid compounds in medicine/biopesticides, characterize and isolate the basis for these compounds.	After attending the lecture, students are expected to be able to explain the biosynthesis and role of phenolic and flavonoid compounds in medicine/biopesticides, the characterization and basis for isolating these compounds.	<b>Criteria:</b> 1.1. Attendance/Participation 20% 2. 2.Practicum/Assignments 30% 3.3. USS 20% 4.4. US 30%  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Presentation and discussion 2 X 50			5%
11	Able to communicate about terpenoid and aromatic compounds and their uses in various fields.	After attending the lecture, students are expected to be able to communicate about aromatic compounds, terpenoids and their use in the fields of medicine and ecology.	<b>Criteria:</b> 1.1. Attendance/Participation 20% 2. 2.Practicum/Assignments 30% 3.3. USS 20% 4.4. US 30%  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Presentation, discussion and writing of 2 X 50 papers			5%
12	Able to identify and explain several compounds that play a role in plant immunity.	After attending the lecture, students are expected to be able to identify and explain 1. Methods of plant defense against herbivores or insects 2. Several compounds involved in plant defense	<b>Criteria:</b> 1.1. Attendance/Participation 20% 2. 2.Practicum/Assignments 30% 3.3. USS 20% 4.4. US 30%  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Presentation and discussion 2 X 50			5%
13	Able to analyze cases, propose theoretical theories, conduct experiments, present in papers and communicate the results of the writing	After attending the lecture, students are expected to be able to: 1. Analyze cases that occur in society 2. Propose solutions to problem solving (theoretical and empirical theory) 3. Conduct experiments on the proposed hypotheses 4. Produce scientific papers based on experiments and literature studies with correct based on the rules of scientific writing 5. Present scientific writing	<b>Criteria:</b> 1.1. Attendance/Participation 20% 2.2. Practicum/Assignments 30% 3.3.USS 20% 4.4.US 30%  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Presentations, discussions, reflections, writing papers Note: the number of meetings for project assignment presentations depends on the number of students, so 3x 2 X 50 meetings are provided			0%

14	Able to analyze cases, propose theoretical theories, conduct experiments, present in papers and communicate the results of the writing	After attending the lecture, students are expected to be able to: 1. Analyze cases that occur in society 2. Propose solutions to problem solving (theoretical and empirical theory) 3. Conduct experiments on the proposed hypotheses 4. Produce scientific papers based on experiments and literature studies with correct based on the rules of scientific writing 5. Present scientific writing	<b>Criteria:</b> 1..1 Attendance/Participation 20% 2.2. Practicum/Assignments 30% 3.3.USS 20% 4.4.US 30% <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Presentations, discussions, reflections, writing papers Note: the number of meetings for project assignment presentations depends on the number of students, so 3x 2 X 50 meetings are provided			0%
15	Students are able to write scientific papers regarding the discovery, development and analysis of drugs/biopesticides from natural ingredients according to the principles of phytochemical-natural products and pharmacology and in accordance with EYD rules.	After attending the lecture, students are expected to be able to: 1. Produce scientific writing based on literature studies correctly based on scientific writing rules and natural products. 2. Students are able to select and retrieve important information from only necessary references.	<b>Criteria:</b> 1.1 Attendance/Participation 20% 2.2. Practicum/Assignments 30% 3.3.USS 20% 4.4.US 30% <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Presentations, discussions, reflections, and writing 2 X 50 papers			5%
16			<b>Forms of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment, Tests				20%

#### Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	26.67%
2.	Project Results Assessment / Product Assessment	61.67%
3.	Test	11.67%
		100%

#### Notes

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Forms of assessment:** test and non-test.
- 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.
- 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.
- Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
- 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%.
- TM=Face to face, PT=Structured assignments, BM=Independent study.