

		<b>Universitas Negeri Surabaya</b> <b>Faculty of Mathematics and Natural Sciences</b> <b>Natural Sciences</b> <b>Education Undergraduate Study Program</b>					<b>Document Code</b>																																										
		<b>SEMESTER LEARNING PLAN</b>																																															
<b>Courses</b>		<b>CODE</b>	<b>Course Family</b>	<b>Credit Weight</b>			<b>SEMESTER</b>	<b>Compilation Date</b>																																									
Science and Technology Development		8420102120		T=2	P=0	ECTS=3.18	8	July 18, 2024																																									
<b>AUTHORIZATION</b>		<b>SP Developer</b>		<b>Course Cluster Coordinator</b>			<b>Study Program Coordinator</b>																																										
		.....		.....			Prof. Dr. Erman, M.Pd.																																										
<b>Learning model</b>	<b>Project Based Learning</b>																																																
<b>Program Learning Outcomes (PLO)</b>	<b>PLO study program that is charged to the course</b>																																																
	<b>Program Objectives (PO)</b>																																																
	<b>PLO-PO Matrix</b>																																																
		<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">P.O</div>																																															
	<b>PO Matrix at the end of each learning stage (Sub-PO)</b>																																																
	<table border="1" style="margin: 0 auto;"> <tr> <td rowspan="2" style="padding: 5px;">P.O</td> <td colspan="16" style="padding: 5px;">Week</td> </tr> <tr> <td style="padding: 5px;">1</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">3</td> <td style="padding: 5px;">4</td> <td style="padding: 5px;">5</td> <td style="padding: 5px;">6</td> <td style="padding: 5px;">7</td> <td style="padding: 5px;">8</td> <td style="padding: 5px;">9</td> <td style="padding: 5px;">10</td> <td style="padding: 5px;">11</td> <td style="padding: 5px;">12</td> <td style="padding: 5px;">13</td> <td style="padding: 5px;">14</td> <td style="padding: 5px;">15</td> <td style="padding: 5px;">16</td> </tr> </table>																P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16																																	
<b>Short Course Description</b>	Understand the process of making syrup from aloe vera to be used as food, the process of converting light energy to electricity, how to obtain it and its benefits, the process of making pn junction solar cells by diffusion, the solar cell energy storage system and the application of these cells in everyday life, and able to create learning media.																																																
<b>References</b>	<b>Main :</b>																																																
	<ol style="list-style-type: none"> <li>1. Arsyad, Azhar. 2016. Media Pembelajaran Edisi Revisi . Jakarta: PT. Raja Grafindo.</li> <li>2. Furnawanthi I.2007. Khasiat dan manfaat lidah buaya si tanaman ajaib Edisi 8 . Jakarta selatan: PT. AgroMedia Pustaka</li> <li>3. Green, MA. 1982. Solar Cells . London: Prentice-Hall, Inc.</li> <li>4. Takahashi, K., and Konagai, M. 1986. Amorphous Silicon Solar Cells. London: Nort Oxford Academic Publishers Ltd.</li> <li>5. Wolf, Stanley, and Tauber, Richard N. 1986. Silicon Processing for the VLSI Era . California: Lattice Press.</li> </ol>																																																
	<b>Supporters:</b>																																																
<b>Supporting lecturer</b>																																																	
<b>Week-</b>	<b>Final abilities of each learning stage (Sub-PO)</b>	<b>Evaluation</b>		<b>Help Learning, Learning methods, Student Assignments, [ Estimated time]</b>				<b>Learning materials [ References ]</b>	<b>Assessment Weight (%)</b>																																								
		<b>Indicator</b>	<b>Criteria &amp; Form</b>	<b>Offline ( offline )</b>	<b>Online ( online )</b>																																												

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1							0%
2							0%
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16							0%

**Evaluation Percentage Recap: Project Based Learning**

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** 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.