



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

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date																																
Capita Selecta Material Physics	4520102096		T=2	P=0	ECTS=3.18	8	July 17, 2024																																
AUTHORIZATION	SP Developer		Course Cluster Coordinator			Study Program Coordinator																																	
			Prof. Dr. Munasir, S.Si., M.Si.																																	
Learning model	Project Based Learning																																						
Program Learning Outcomes (PLO)	PLO study program which is charged to the course																																						
	Program Objectives (PO)																																						
	PLO-PO Matrix																																						
		<table border="1" style="margin: auto;"> <tr> <td style="width: 50px; height: 20px;">P.O</td> </tr> </table>						P.O																															
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Short Course Description	This course contains theoretical studies and practical experience related to the synthesis and characterization of "Lithium Ion Batteries" as a source of electrical energy.																																						
	<table border="1" style="width: 100%;"> <tr> <td rowspan="2" style="width: 30px;">P.O</td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 15px;">1</td> <td style="width: 15px;">2</td> <td style="width: 15px;">3</td> <td style="width: 15px;">4</td> <td style="width: 15px;">5</td> <td style="width: 15px;">6</td> <td style="width: 15px;">7</td> <td style="width: 15px;">8</td> <td style="width: 15px;">9</td> <td style="width: 15px;">10</td> <td style="width: 15px;">11</td> <td style="width: 15px;">12</td> <td style="width: 15px;">13</td> <td style="width: 15px;">14</td> <td style="width: 15px;">15</td> <td style="width: 15px;">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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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16																							
References	Main :																																						
	1. Masaki Yoshio, Ralph J. Brodd, and Akiya Kozawa. 2009. Lithium Ion Batteries. New York: Springer 2. Yuping Wu. 2015. Lithium Ion Batteries Fundamentals and Applications. New York: CRC Press																																						
	Supporters:																																						
Supporting lecturer	Dr. Zainul Arifin Imam Supardi, 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	Students master the rationality of the importance of Lithium Ion Batteries technology as a source of electrical energy	<ol style="list-style-type: none"> 1.Mastering the weaknesses of NICAD battery technology, etc 2.Master the advantages of lithium ion batteries 3. Technological and economic aspects of lithium ion batteries 	Criteria: Product assessment in the range of 0 - 100 Presentation performance: Very Good (A), Good (B), and Fair (C) Activity: Very Active (A). Active (B). and Moderately Active (C)	Information gathering Discussion of study results 2 X 50			0%
2	Students master the rationality of the importance of Lithium Ion Batteries technology as a source of electrical energy	<ol style="list-style-type: none"> 1.Mastering the weaknesses of NICAD battery technology, etc 2.Master the advantages of lithium ion batteries 3. Technological and economic aspects of lithium ion batteries 	Criteria: Product assessment in the range of 0 - 100 Presentation performance: Very Good (A), Good (B), and Fair (C) Activity: Very Active (A). Active (B). and Moderately Active (C)	Information gathering Discussion of study results 2 X 50			0%
3	Students master the rationality of the importance of Lithium Ion Batteries technology as a source of electrical energy	<ol style="list-style-type: none"> 1.Mastering the weaknesses of NICAD battery technology, etc 2.Master the advantages of lithium ion batteries 3. Technological and economic aspects of lithium ion batteries 	Criteria: Product assessment in the range of 0 - 100 Presentation performance: Very Good (A), Good (B), and Fair (C) Activity: Very Active (A). Active (B). and Moderately Active (C)	Information gathering Discussion of study results 2 X 50			0%
4							0%
5							0%
6							0%
7							0%
8							0%
9							0%
10							0%
11							0%
12							0%
13							0%
14							0%
15							0%
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.