

		<p style="text-align: center;">Universitas Negeri Surabaya Faculty of Mathematics and Natural Sciences Undergraduate Physics Study Program</p>					<p style="text-align: center;">Document Code</p>																																										
SEMESTER LEARNING PLAN																																																	
Courses		CODE	Course Family	Credit Weight			SEMESTER	Compilation Date																																									
Physics of Metals		4520102067		T=2	P=0	ECTS=3.18	5	July 18, 2024																																									
AUTHORIZATION		SP Developer		Course Cluster Coordinator			Study Program Coordinator																																										
				Prof. Dr. Munasir, S.Si., M.Si.																																										
Learning model	Case Studies																																																
Program Learning Outcomes (PLO)	PLO study program that is charged to the course																																																
	Program Objectives (PO)																																																
	PLO-PO Matrix																																																
		<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 50px; text-align: center;">P.O</td> <td colspan="16"></td> </tr> </table>							P.O																																								
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	PO Matrix at the end of each learning stage (Sub-PO)																																																
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2" style="width: 30px; text-align: center;">P.O</td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 20px; text-align: center;">1</td> <td style="width: 20px; text-align: center;">2</td> <td style="width: 20px; text-align: center;">3</td> <td style="width: 20px; text-align: center;">4</td> <td style="width: 20px; text-align: center;">5</td> <td style="width: 20px; text-align: center;">6</td> <td style="width: 20px; text-align: center;">7</td> <td style="width: 20px; text-align: center;">8</td> <td style="width: 20px; text-align: center;">9</td> <td style="width: 20px; text-align: center;">10</td> <td style="width: 20px; text-align: center;">11</td> <td style="width: 20px; text-align: center;">12</td> <td style="width: 20px; text-align: center;">13</td> <td style="width: 20px; text-align: center;">14</td> <td style="width: 20px; text-align: center;">15</td> <td style="width: 20px; text-align: center;">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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Short Course Description	Understanding the properties of metals and various types of metal alloys, development of microstructure and mechanical properties, heat treatment of metal alloys (phase diagrams and phase transformations in metals), metal fabrication, metal characterization, corrosion processes in metals and metal applications in industry and in life. daily.																																																
References	Main :																																																
	1. [1] Callister, Jr.D William, 2007, "Materials Science And Engineering" , 7-th, John Willey & Sons, Inc. [2] Benjamin Crowell, 2009, " Simple Nature: An Introduction to Physics for Engineering and Physical Science Student", www.lightandmatter.com. [3] Sriati Djaprie (terj. Lawrence H Van Vlack), 1989 ,"Ilmu dan Teknologi Bahan", Edisi ke lima, Erlangga, Jakarta. [4] Brown, Lemay, Bursten, Murphy, "Chemistry The Central Science", 11th eds, Pearson Educational International, 2009, hal. 980 – 1011.																																																
	Supporters:																																																
Supporting lecturer	Prof. Dr. Munasir, 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							0%
2							0%
3							0%
4							0%
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14							0%
15							0%
16							0%

Evaluation Percentage Recap: Case Study

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.