

		Universitas Negeri Surabaya Faculty of Engineering, Mechanical Engineering Undergraduate Study Program					Document Code																																										
SEMESTER LEARNING PLAN																																																	
Courses		CODE	Course Family		Credit Weight		SEMESTER	Compilation Date																																									
Energy Management		2120102034			T=2	P=0	ECTS=3.18	6 July 18, 2024																																									
AUTHORIZATION		SP Developer		Course Cluster Coordinator		Study Program Coordinator																																											
			Ir. Priyo Heru Adiwibowo, S.T., M.T.																																											
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: 100px; height: 30px; vertical-align: middle;">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; height: 30px; vertical-align: middle;">P.O</td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 20px; height: 20px; text-align: center;">1</td> <td style="width: 20px; height: 20px; text-align: center;">2</td> <td style="width: 20px; height: 20px; text-align: center;">3</td> <td style="width: 20px; height: 20px; text-align: center;">4</td> <td style="width: 20px; height: 20px; text-align: center;">5</td> <td style="width: 20px; height: 20px; text-align: center;">6</td> <td style="width: 20px; height: 20px; text-align: center;">7</td> <td style="width: 20px; height: 20px; text-align: center;">8</td> <td style="width: 20px; height: 20px; text-align: center;">9</td> <td style="width: 20px; height: 20px; text-align: center;">10</td> <td style="width: 20px; height: 20px; text-align: center;">11</td> <td style="width: 20px; height: 20px; text-align: center;">12</td> <td style="width: 20px; height: 20px; text-align: center;">13</td> <td style="width: 20px; height: 20px; text-align: center;">14</td> <td style="width: 20px; height: 20px; text-align: center;">15</td> <td style="width: 20px; height: 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	This course explains how to manage energy use, starting with an audit process on parts of the room or equipment that consume energy.																																																
References	Main :																																																
	1. Barney L. Capehart, Wayne C. Turner, William J. Kennedy. Guide to Energy Management. The Fairmont Press, Inc. 2. Steve Doty, Wayne C Turner. 2009. Energy Management Handbook. The Fairmont Press, Inc. 3. Steve Doty, 2010. CommerCial energy auditing Reference Handbook. The Fairmont Press, Inc																																																
	Supporters:																																																
Supporting lecturer	Indra Herlamba Siregar, S.T., M.T.																																																
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 are able to carry out energy audits and implement them in the form of regulating energy use	Students understand the definition of Energy Management and Forms of Energy Audit		Live Learning 2 X 50			0%
2	Students are able to carry out energy audits and implement them in the form of regulating energy use	Students are able to implement energy balance in an audit action	Criteria: Able to calculate the energy balance of a problem	100 minutes of Live Learning			0%
3	Students are able to carry out energy audits and implement them in the form of regulating energy use	Students are able to use measuring instruments when conducting audits	Criteria: Able to use multi meter and cosphi meter	100 minutes of Live Learning			0%
4	Students are able to carry out energy audits and implement them in the form of regulating energy use	Students are able to audit boiler type equipment	Criteria: Able to calculate energy consumption in boilers	200 minutes of Live Learning			0%
5							0%
6	Students are able to carry out energy audits and implement them in the form of regulating energy use	Students are able to audit furnace type equipment	Criteria: Able to calculate energy consumption in the furnace	100 minutes of Live Learning			0%
7	Students are able to carry out energy audits and implement them in the form of regulating energy use	Students are able to audit Cogen and turbine type equipment	Criteria: Able to calculate energy consumption on COGEN and Turbines	200 minutes of Live Learning			0%
8							0%
9	Students are able to carry out energy audits and implement them in the form of regulating energy use	-----	Criteria: Minimum 75% correct answer	100 minutes of Live Learning			0%
10	Students are able to carry out energy audits and implement them in the form of regulating energy use	Students are able to audit HE type equipment	Criteria: Able to calculate energy consumption on HE	200 minutes of Live Learning			0%
11							0%
12	Students are able to carry out energy audits and implement them in the form of regulating energy use	Students are able to audit motor type equipment	Criteria: Able to calculate energy consumption on motorbikes	200 minutes of Live Learning			0%

13							0%
14	Students are able to carry out energy audits and implement them in the form of regulating energy use	Students are able to audit pump type equipment	Criteria: Able to calculate energy consumption on the pump	100 minutes of Live Learning			0%
15	Students are able to carry out energy audits and implement them in the form of regulating energy use	Students are able to audit compressor type equipment	Criteria: Able to calculate energy consumption on the Compressor	100 minutes of Live Learning			0%
16							0%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
		0%

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.