



**Universitas Negeri Surabaya  
Faculty of Engineering,  
Electrical Engineering 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>																																										
Electrical Power Conditioning Systems	2020102223		T=2	P=0	ECTS=3.18	7	July 18, 2024																																										
<b>AUTHORIZATION</b>		<b>SP Developer</b>		<b>Course Cluster Coordinator</b>		<b>Study Program Coordinator</b>																																											
		.....		.....		Dr. Lusia Rakhmawati, S.T., M.T.																																											
<b>Learning model</b>	Case Studies																																																
<b>Program Learning Outcomes (PLO)</b>	PLO study program that is charged to the course																																																
	Program Objectives (PO)																																																
	PLO-PO Matrix																																																
		P.O																																															
	PO Matrix at the end of each learning stage (Sub-PO)																																																
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2" style="width: 5%;">P.O</td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 5%;">1</td> <td style="width: 5%;">2</td> <td style="width: 5%;">3</td> <td style="width: 5%;">4</td> <td style="width: 5%;">5</td> <td style="width: 5%;">6</td> <td style="width: 5%;">7</td> <td style="width: 5%;">8</td> <td style="width: 5%;">9</td> <td style="width: 5%;">10</td> <td style="width: 5%;">11</td> <td style="width: 5%;">12</td> <td style="width: 5%;">13</td> <td style="width: 5%;">14</td> <td style="width: 5%;">15</td> <td style="width: 5%;">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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<b>Short Course Description</b>	This course provides students with the principles of implementing energy savings, recognizing energy saving potentials, creating audit program steps, and saving energy. Energy information and monitoring system (SIME), energy management in air conditioning systems, energy management in lighting systems, energy management in electric motor systems, energy audits, and calculating energy savings opportunities.																																																
<b>References</b>	<b>Main :</b>																																																
	1. _____, 2000. <i>Konservasi Energi Sistem Tata Udara pada Bangunan Gedung</i> . Jakarta: Standar Nasional Indonesia, SNI 03-6390-2000. _____, 2012. <i>Pedoman Teknis Prasarana Rumah Sakit Sistem Instalasi Tata Udara</i> . Jakarta: Direktorat Bina Pelayanan Penunjang dan Sarana Kesehatan Direktorat Bina Upaya Kesehatan Kementerian Kesehatan Republik Indonesia. _____, 2011. <i>Pedoman Teknis Audit Energi, Implementasi Konservasi Energi dan Pengurangan Emisi CO2 di Sektor Industri (Fase 1)</i> . Jakarta: Pusat Pengkajian Industri Hijau dan Lingkungan Hidup Badan Pengkajian dan Mutu Industri (BPKIMI), Kementerian Perindustrian.																																																
	<b>Supporters:</b>																																																
<b>Supporting lecturer</b>	Dr. Tri Rijanto, M.Pd., M.T. Unit Three Kartini, S.T., M.T., Ph.D.																																																
<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	Providing provisions on the principles of implementing energy savings	1. Students can explain the three principles of energy saving. 2. Students identify indicators of wasteful energy use. 3. Students can provide energy saving alternatives	<b>Criteria:</b> PAP with criteria 80	Lectures, discussions and questions and answers 2 X 50		0%
2	Providing provisions on the principles of implementing energy savings	1. Students can explain the three principles of energy saving. 2. Students identify indicators of wasteful energy use. 3. Students can provide energy saving alternatives	<b>Criteria:</b> PAP with criteria 80	Lectures, discussions and questions and answers 2 X 50		0%
3	Students are able to recognize the potential for energy savings. Students are able to develop audit program steps and energy savings	1. Students identify indicators of potential energy savings. 2. Students are able to develop audit and energy saving program steps	<b>Criteria:</b> PAP with criteria 80	Lectures, discussions, questions and answers, and assignments 2 X 50		0%
4	Students are able to recognize the potential for energy savings. Students are able to develop audit program steps and energy savings	1. Students identify indicators of potential energy savings. 2. Students are able to develop audit and energy saving program steps	<b>Criteria:</b> PAP with criteria 80	Lectures, discussions, questions and answers, and assignments 2 X 50		0%
5	Students can present assignments	1. Students identify indicators of potential energy savings according to the context of their assignment. 2. Students are able to develop audit and energy saving program steps according to the context of their assignment.	<b>Criteria:</b> PAP with criteria 80	Presentation, discussion and questions and answers 2 X 50		0%
6	Students are able to design energy information and monitoring systems (SIME)	1. Students can determine the steps to design an energy usage monitoring system. 2. Students can design an energy usage monitoring system	<b>Criteria:</b> PAP with criteria 80	Energy savings, energy audits and 2 X 50 information systems		0%
7	Students are able to design energy information and monitoring systems (SIME)	1. Students can determine the steps to design an energy usage monitoring system. 2. Students can design an energy usage monitoring system	<b>Criteria:</b> PAP with criteria 80	Energy savings, energy audits and 2 X 50 information systems		0%
8	1. Provide provisions on the principles of implementing energy savings. 2. Students are able to recognize the potential for energy savings. 3. Students are able to develop audit and energy saving program steps. 4. Energy information and monitoring system (SIME).	1. Students can explain the principles of implementing energy savings. 2. Students can identify energy saving potentials. 3. Students are able to prepare steps for an energy audit and energy saving program. 4. Students can design energy information and monitoring systems (SIME).	<b>Criteria:</b> PAP with criteria 80	Midterm Exam (UTS) 2 X 50		0%

9	1. Students are able to carry out energy management in air conditioning systems. 2. Students are able to carry out energy management in lighting systems. 3. Students are able to carry out energy management in electric motor systems	1. Students are able to develop energy management in air conditioning systems. 2. Students are able to develop energy management in lighting systems. 3. Students are able to develop energy management in electric motor systems.	<b>Criteria:</b> PAP with criteria 80	Lectures, discussions, questions and answers, and assignments 2 X 50		0%
10	1. Students are able to carry out energy management in air conditioning systems. 2. Students are able to carry out energy management in lighting systems. 3. Students are able to carry out energy management in electric motor systems	1. Students are able to develop energy management in air conditioning systems. 2. Students are able to develop energy management in lighting systems. 3. Students are able to develop energy management in electric motor systems.	<b>Criteria:</b> PAP with criteria 80	Lectures, discussions, questions and answers, and assignments 2 X 50		0%
11	1. Students are able to carry out energy management in air conditioning systems. 2. Students are able to carry out energy management in lighting systems. 3. Students are able to carry out energy management in electric motor systems	1. Students are able to develop energy management in air conditioning systems. 2. Students are able to develop energy management in lighting systems. 3. Students are able to develop energy management in electric motor systems.	<b>Criteria:</b> PAP with criteria 80	Lectures, discussions, questions and answers, and assignments 2 X 50		0%
12	Students are able to carry out energy audits	1. Students are able to prepare audit steps. 2. Students are able to carry out energy audits. 3. Students are able to formulate recommendations from audit data.	<b>Criteria:</b> PAP with criteria 80	Lectures, discussions, questions and answers, and assignments 2 X 50		0%
13	Students are able to calculate energy saving opportunities	1. Students are able to calculate energy saving opportunities. 2. Students are able to formulate recommendations based on data calculating energy saving opportunities	<b>Criteria:</b> PAP with criteria 80	Lectures, discussions, questions and answers, and assignments 2 X 50		0%
14	Students are able to calculate energy saving opportunities	1. Students are able to calculate energy saving opportunities. 2. Students are able to formulate recommendations based on data calculating energy saving opportunities	<b>Criteria:</b> PAP with criteria 80	Lectures, discussions, questions and answers, and assignments 2 X 50		0%
15	Students are able to calculate energy saving opportunities	1. Students are able to calculate energy saving opportunities. 2. Students are able to formulate recommendations based on data calculating energy saving opportunities	<b>Criteria:</b> PAP with criteria 80	Lectures, discussions, questions and answers, and assignments 2 X 50		0%

16							0%
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**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.