



**Universitas Negeri Surabaya**  
**Faculty of Engineering**  
**, Electrical Engineering Education 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 Measurements	8320103099		T=3	P=0	ECTS=4.77	3	July 18, 2024																																											
<b>AUTHORIZATION</b>	<b>SP Developer</b>		<b>Course Cluster Coordinator</b>			<b>Study Program Coordinator</b>																																												
	.....		.....			Dr. Nur Kholis, S.T., M.T.																																												
<b>Learning model</b>	<b>Case Studies</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>																																																	
		<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 10%; text-align: center;">P.O</td> <td colspan="16"></td> </tr> </table>						P.O																																										
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<b>Short Course Description</b>	<b>PO Matrix at the end of each learning stage (Sub-PO)</b>																																																	
		<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 10%; text-align: center;">P.O</td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td></td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6</td> <td style="text-align: center;">7</td> <td style="text-align: center;">8</td> <td style="text-align: center;">9</td> <td style="text-align: center;">10</td> <td style="text-align: center;">11</td> <td style="text-align: center;">12</td> <td style="text-align: center;">13</td> <td style="text-align: center;">14</td> <td style="text-align: center;">15</td> <td style="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
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<b>References</b>	<b>Main :</b>																																																	
	<ol style="list-style-type: none"> <li>1. Cooper W D. 1999. Instrumentasi Elektronik dan Teknik Pengukuran, Edisi Ke-2 . Jakarta: Penerbit Erlangga.</li> <li>2. Soedjana S dan Nishino O. 2000. Pengukuran dan Alat-Alat Ukur Listrik . Jakarta: Paradnya Paramita.</li> <li>3. Rudy Setiabudi. 2007. Pengukuran Besaran Listrik. Jakarta: Lembaga Penerbit FEUI (LP-FEUI).</li> <li>4. Sapiie S dan Nishino. 2005. Pengukuran dan Alat-Alat Ukur Listrik . Jakarta: Pradnya Paramita.</li> </ol>																																																	
	<b>Supporters:</b>																																																	
<b>Supporting lecturer</b>	Dr. Subuh Isnur Haryudo, S.T., M.T. Yulia Fransisca, S.Pd., M.Pd.																																																	
<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	Students are able to understand the unit system in electrical measurements.	<ol style="list-style-type: none"> <li>1.Explain the units and quantities of electricity.</li> <li>2.Convert various units of electrical quantities into basic quantities and derived quantities.</li> <li>3.Explain the symbols for electrical measuring instruments.</li> <li>4.Using international units for measuring electricity.</li> </ol>	<b>Criteria:</b> Students will get marks if they can explain correctly.	Lectures, discussions and practice assignments. 3 X 50			0%
2	Students are able to understand the unit system in electrical measurements.	<ol style="list-style-type: none"> <li>1.Explain the units and quantities of electricity.</li> <li>2.Convert various units of electrical quantities into basic quantities and derived quantities.</li> <li>3.Explain the symbols for electrical measuring instruments.</li> <li>4.Using international units for measuring electricity.</li> </ol>		Lectures, discussions and practice assignments. 3 X 50			0%
3	Students are able to understand electrical measurement techniques.	<ol style="list-style-type: none"> <li>1.Explain the types of measurements.</li> <li>2.Explain how to measure.</li> <li>3.Explain the general construction of measuring instruments.</li> <li>4.Describes a pointer or note taker.</li> </ol>		Lectures, questions and answers and discussions. 3 X 50			0%
4	Students are able to describe the working principles of elements and electric currents.	<ol style="list-style-type: none"> <li>1.Explain the concept of electromotive force (EMF) as a source of electric current.</li> <li>2.Distinguish between AC voltage and DC voltage in graphical form.</li> <li>3.Explain the elements of electricity.</li> <li>4.Explain the arrangement and how electrical elements work.</li> </ol>	<b>Criteria:</b> Students will get marks if they can answer correctly	Lectures, discussions and practice questions 3 X 50			0%

5	Students are able to describe the working principles of elements and electric currents.	<ol style="list-style-type: none"> <li>1.Explain the concept of electromotive force (EMF) as a source of electric current.</li> <li>2.Distinguish between AC voltage and DC voltage in graphical form.</li> <li>3.Explain the elements of electricity.</li> <li>4.Explain the arrangement and how electrical elements work.</li> </ol>	<b>Criteria:</b> Students will get marks if they can answer correctly	Lectures, discussions and practice questions 3 X 50			0%
6	Students are able to formulate the relationship between energy and electrical power, as well as their use in everyday life.	<ol style="list-style-type: none"> <li>1.Explain the relationship between V and I and the electrical energy used.</li> <li>2.Explain the relationship between electrical energy, electrical power and their units (KWh and joules).</li> <li>3.Apply the concept of energy and electrical power in calculating household electricity use based on the numbers printed on the kWh meter.</li> </ol>	<b>Criteria:</b> Students will get points if they can answer correctly	Lectures, discussions, assignments, exercises, searching for library sources and other references 3 X 50			0%
7	Students are able to formulate the relationship between energy and electrical power, as well as their use in everyday life.	<ol style="list-style-type: none"> <li>1.Explain the relationship between V and I and the electrical energy used.</li> <li>2.Explain the relationship between electrical energy, electrical power and their units (KWh and joules).</li> <li>3.Apply the concept of energy and electrical power in calculating household electricity use based on the numbers printed on the kWh meter.</li> </ol>	<b>Criteria:</b> Students will get points if they can answer correctly	Lectures, discussions, assignments, exercises, searching for library sources and other references 3 X 50			0%
8							0%
9							0%
10							0%
11							0%

12							0%
13							0%
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.**