



**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>																																
Power Electronics	8320102027		T=2 P=0 ECTS=3.18	4	July 17, 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>	Case Studies																																				
<b>Program Learning Outcomes (PLO)</b>	<b>PLO study program that is charged to the course</b>																																				
	<b>PLO-5</b>	Able to align the electrical and electronics engineering training curriculum in vocational education that is relevant to the demands of global industrial development (Education).																																			
	<b>PLO-13</b>	Able to design circuits, devices and products in the electrical and electronics engineering expertise program (SSC3.1).																																			
	<b>PLO-14</b>	Able to become a practitioner who can apply his knowledge and skills to develop products in a comprehensive electrical engineering and electronics engineering skills program (SSC4.1)																																			
	<b>Program Objectives (PO)</b>																																				
	<b>PLO-PO Matrix</b>																																				
		<table border="1" style="margin: auto;"> <tr> <td style="width: 20%;">P.O</td> <td style="width: 20%;">PLO-5</td> <td style="width: 20%;">PLO-13</td> <td style="width: 20%;">PLO-14</td> </tr> </table>				P.O	PLO-5	PLO-13	PLO-14																												
P.O	PLO-5	PLO-13	PLO-14																																		
<b>PO Matrix at the end of each learning stage (Sub-PO)</b>																																					
	<table border="1" style="margin: auto;"> <tr> <td rowspan="2" style="width: 10%;">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	16
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16																					
<b>Short Course Description</b>	Power electronics vs linear electronics, switching components: Diode, BJT, SCR, DIAC, TRIAC, MOSFET, IGBT, GTO, Power Electronic Process Classification, DC-DC Converter Topology, converter topology simulation, dc-ac switch mode, ac-converter ac (Single phase, Three phase and the others), Computer simulation of power electronic Converters, Resonant Converters: Zero-Voltage and/or Zero-Current Switching, Computer simulation of power electronic Converters, DC/AC Motor Drives.																																				
<b>References</b>	<b>Main :</b>																																				
	<ol style="list-style-type: none"> <li>1. Modul Elektronika Daya, <a href="http://bambangsp.wordpress.com">http://bambangsp.wordpress.com</a></li> <li>2. Power Electronic: Theory and Application, Abdul Rasid, 200</li> <li>3. Power Electronics Semiconductor Switches, R.S. Ramshaw, 1993.</li> <li>4. Power Electronics, Converter, Applications and design, Mohan, Undeland, Robbins, 1995.</li> <li>5. Software wajib : MATLAB dan PSIM</li> </ol>																																				
	<b>Supporters:</b>																																				
<b>Supporting lecturer</b>	Prof. Dr. Bambang Suprianto, M.T. L. Endah Cahya Ningrum, S.Pd., M.Pd.																																				

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 can explain the history of the development of Power Electronics systems	Explore the history of power electronics Understand the basic definitions and concepts of Power Electronics	<b>Criteria:</b> Good presentation and ability to convey content	Lectures, paper assignments and discussions, and questions and answers 2 X 50			0%
2	Students can make papers on Power Electronics components	Have the ability to identify components and their functions	<b>Criteria:</b> Paper results and good presentation skills are given an A (86-100)	Paper assignments and presentations 2 X 50			0%
3	Students can explain the function of Diode, BJT, SCR, TRIAC, DIAC MOSFET, IGBT, GTO	Have the ability to understand the function of Power Electronic components		Paper assignments, lectures, discussion presentations 2 X 50			0%
4	Students can explain the function of Diode, BJT, SCR, TRIAC, DIAC MOSFET, IGBT, GTO	Have the ability to understand the function of Power Electronic components		Paper assignments, lectures, discussion presentations 2 X 50			0%
5	Students can explain the function of Diode, BJT, SCR, TRIAC, DIAC MOSFET, IGBT, GTO	Have the ability to understand the function of Power Electronic components		Paper assignments, lectures, discussion presentations 2 X 50			0%
6	Students can explain the function of Diode, BJT, SCR, TRIAC, DIAC MOSFET, IGBT, GTO	Have the ability to understand the function of Power Electronic components		Paper assignments, lectures, discussion presentations 2 X 50			0%
7	Students can explain the function of a diode	Have the ability to explain the function of diodes		Power Point 2 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
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## 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.