



**Universitas Negeri Surabaya  
Vocational Faculty,  
D4 Electrical Engineering 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>																																
DC Electric Machine Practice	99992040102031		T=2 P=0 ECTS=3.18	3	July 17, 2024																																
<b>AUTHORIZATION</b>	<b>SP Developer</b>		<b>Course Cluster Coordinator</b>		<b>Study Program Coordinator</b>																																
	.....		.....		Mahendra Widyartono, S.T., M.T.																																
<b>Learning model</b>	<b>Project Based Learning</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>																																				
		P.O																																			
<b>Short Course Description</b>	<b>PO Matrix at the end of each learning stage (Sub-PO)</b>																																				
		<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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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16																					
<b>References</b>	<p><b>Main :</b></p> <ol style="list-style-type: none"> <li>1. Joko, 2014. Mesin Arus Searah. Jurusan Teknik Elektro FT Unesa Surabaya, Surabaya.</li> <li>2. Joko, 2014. Lembar Eksperiment Sheet Mahasiswa Mesin-Mesin Listrik (LES). Jurusan Teknik Elektro FT Unesa Surabaya, Surabaya</li> <li>3. Masdoeki R. 1994. Mesin Khusus DC. Surabaya: University Press IKIP Surabaya</li> <li>4. Masdoeki R. 2002. Mesin Arus Searah I dan II. Surabaya: University Press UNESA Sen SK. 1976. Rotating Electrical Machinery. New Delhi: Khana Publishers</li> </ol> <p><b>Supporters:</b></p>																																				
<b>Supporting lecturer</b>	Mahendra Widyartono, S.T., M.T. Aditya Chandra Hermawan, S.ST., M.T.																																				
<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 characteristics of direct current generators in no-load conditions.	<ol style="list-style-type: none"> <li>1.Explain the characteristics of a shunt dc generator without load</li> <li>2.Explain the relationship/circuit in the practical dc generator without load.</li> <li>3.Explain the effect of field current on terminal voltage.</li> </ol>		Demonstrations, experiments and practical report assignments 3 X 50			0%
2	Students are able to understand the characteristics of direct current generators in no-load conditions.	<ol style="list-style-type: none"> <li>1.Explain the characteristics of a shunt dc generator without load</li> <li>2.Explain the relationship/circuit in the practical dc generator without load.</li> <li>3.Explain the effect of field current on terminal voltage.</li> </ol>		Demonstrations, experiments and practical report assignments 3 X 50			0%
3	Students are able to understand the characteristics of direct current generators in no-load conditions.	<ol style="list-style-type: none"> <li>1.Explain the characteristics of a shunt dc generator without load</li> <li>2.Explain the relationship/circuit in the practical dc generator without load.</li> <li>3.Explain the effect of field current on terminal voltage.</li> </ol>		Demonstrations, experiments and practical report assignments 3 X 50			0%
4	Students are able to understand the characteristics of direct current generators under load conditions	<ol style="list-style-type: none"> <li>1.Explain the characteristics of a loaded dc shunt generator.</li> <li>2.Explain the connections/circuits in the practicum of a direct current generator with a load.</li> <li>3.Explain the effect of load on load current and terminal voltage.</li> </ol>		Demonstrations, experiments and practical report assignments 3 X 50			0%
5	Students are able to understand the characteristics of direct current generators under load conditions	<ol style="list-style-type: none"> <li>1.Explain the characteristics of a loaded dc shunt generator.</li> <li>2.Explain the connections/circuits in the practicum of a direct current generator with a load.</li> <li>3.Explain the effect of load on load current and terminal voltage.</li> </ol>		Demonstrations, experiments and practical report assignments 3 X 50			0%
6	Students are able to understand the characteristics of direct current generators under load conditions	<ol style="list-style-type: none"> <li>1.Explain the characteristics of a loaded dc shunt generator.</li> <li>2.Explain the connections/circuits in the practicum of a direct current generator with a load.</li> <li>3.Explain the effect of load on load current and terminal voltage.</li> </ol>		Demonstrations, experiments and practical report assignments 3 X 50			0%

7	Students are able to understand the characteristics of direct current generator settings under load conditions	<ol style="list-style-type: none"> <li>1.Explain the characteristics of a loaded dc shunt generator arrangement.</li> <li>2.Explain the relationship/circuit in the practicum for setting up a direct current generator with a load.</li> <li>3.Explain the effect of field current as a function of load current with a fixed terminal voltage.</li> </ol>		Demonstrations, experiments and practical report assignments 3 X 50			0%
8							0%
9	Students are able to understand the characteristics of direct current generator settings under load conditions	<ol style="list-style-type: none"> <li>1.Explain the characteristics of a loaded dc shunt generator arrangement.</li> <li>2.Explain the relationship/circuit in the practicum for setting up a direct current generator with a load.</li> <li>3.Explain the effect of field current as a function of load current with a fixed terminal voltage.</li> </ol>		Demonstrations, experiments and practical report assignments 3 X 50			0%
10	Students are able to understand the characteristics of speed regulation in series DC motors	<ol style="list-style-type: none"> <li>1.Explain the characteristics of speed regulation in series DC motors.</li> <li>2.Explain the connections/circuits in the DC series motor practical.</li> <li>3.Explain the effect of source voltage on the rotation of a series DC motor.</li> </ol>		Demonstrations, experiments and practical report assignments 3 X 50			0%
11	Students are able to understand the characteristics of speed regulation in series DC motors	<ol style="list-style-type: none"> <li>1.Explain the characteristics of speed regulation in series DC motors.</li> <li>2.Explain the connections/circuits in the DC series motor practical.</li> <li>3.Explain the effect of source voltage on the rotation of a series DC motor.</li> </ol>		Demonstrations, experiments and practical report assignments 3 X 50			0%
12	Students are able to understand the characteristics of speed regulation in dc shunt motors	<ol style="list-style-type: none"> <li>1.Explain the characteristics of speed regulation in dc shunt motors.</li> <li>2.Explain the connections/circuits in the DC shunt motor practicum.</li> <li>3.Explain the effect of source voltage on the rotation of a dc shunt motor.</li> <li>4.Explain the effect of field current on the rotation of a dc shunt motor.</li> </ol>		Demonstrations, experiments and practical report assignments 3 X 50			0%

13	Students are able to understand the characteristics of speed regulation in dc shunt motors	1.Explain the characteristics of speed regulation in dc shunt motors. 2.Explain the connections/circuits in the DC shunt motor practicum. 3.Explain the effect of source voltage on the rotation of a dc shunt motor. 4.Explain the effect of field current on the rotation of a dc shunt motor.		Demonstrations, experiments and practical report assignments 3 X 50			0%
14	Students are able to understand the characteristics of speed regulation in long compound and short compound DC motors	1.Explain the characteristics of speed regulation in long compound and short compound dc motors. 2.Explain the relationships/circuits in the long compound and short compound DC motor practicum. 3.Explain the effect of source voltage on the rotation of long compound and short compound dc motors.		Demonstrations, experiments and practical report assignments 3 X 50			0%
15	Students are able to understand the characteristics of speed regulation in long compound and short compound DC motors	1.Explain the characteristics of speed regulation in long compound and short compound dc motors. 2.Explain the relationships/circuits in the long compound and short compound DC motor practicum. 3.Explain the effect of source voltage on the rotation of long compound and short compound dc motors.		Demonstrations, experiments and practical report assignments 3 X 50			0%
16							0%

**Evaluation Percentage Recap: Project Based Learning**

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** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities 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.

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.