



Universitas Negeri Surabaya
Faculty of Engineering,
Electrical Engineering Undergraduate Study Program

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date																																											
Electrical Machines I	2020102084		T=2	P=0	ECTS=3.18	5	July 18, 2024																																											
AUTHORIZATION	SP Developer		Course Cluster Coordinator			Study Program Coordinator																																												
			Dr. Lusia Rakhmawati, 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																																																	
		P.O																																																
	PO Matrix at the end of each learning stage (Sub-PO)																																																	
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;"></td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 5%;"></td> <td style="width: 3%;">1</td> <td style="width: 3%;">2</td> <td style="width: 3%;">3</td> <td style="width: 3%;">4</td> <td style="width: 3%;">5</td> <td style="width: 3%;">6</td> <td style="width: 3%;">7</td> <td style="width: 3%;">8</td> <td style="width: 3%;">9</td> <td style="width: 3%;">10</td> <td style="width: 3%;">11</td> <td style="width: 3%;">12</td> <td style="width: 3%;">13</td> <td style="width: 3%;">14</td> <td style="width: 3%;">15</td> <td style="width: 3%;">16</td> </tr> </table>																Week																	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Week																																																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16																																		
Short Course Description	The Electrical Machines 1 course discusses understanding transformers, dc generators and dc motors. Transformers include working principles, transformer construction, replacement circuits, vector diagrams, regulation, losses, efficiency and polarity, 3-phase transformer connections, tap changers, and parallel work of transformers. DC generators include construction, working principles, field strengthening systems, armature windings, brush voltage and parallel generator work. DC motors include DC motor construction, working principles, starting the motor, creating a couple, setting the direction of rotation, starting and braking the DC motor and regulating the speed of the DC motor.																																																	
References	Main :																																																	
	<ol style="list-style-type: none"> 1. Guru B S & Hiziroghu H R. 2001. Electric Machinery and Transformers, Third Edition . New York: Oxford University Press. 2. Mehta V K & Mehta R. 2006. Principles of Electrical Machines . 3. Wildi T. 2006. Electrical Machines, Drives, and Power Systems, Sixth Edition . New Jersey: Pearson, Prentice Hall 4. Zuhail. 2000. Dasar Teknik Tenaga Listrik dan Elektronika Daya . Jakarta: PT. Gramedia Pustaka Utama 																																																	
	Supporters:																																																	
Supporting lecturer	Dr. Tri Rijanto, M.Pd., M.T. Prof. Dr. Joko, M.Pd., M.T. Widi Aribowo, 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	Explain the working principle of a transformer	<ol style="list-style-type: none"> 1.Explain the working principle of a transformer. 2.Explain the construction of a transformer. 3.Explain the transformer replacement circuit. 	Criteria: Score Value 1 to 4	Lectures, discussions, questions and answers 2 X 50			0%
2	Explains, vector diagrams, regulation, losses, efficiency and polarity.	<ol style="list-style-type: none"> 1.Explain the vector diagram of a transformer replacement circuit. 2.Explain losses and efficiency in transformers. 	Criteria: Score Value 1 to 4	Lectures, discussions, questions and answers, and practice questions. 2 X 50			0%
3	Explains, vector diagrams, regulation, losses, efficiency and polarity.	<ol style="list-style-type: none"> 1.Explain the vector diagram of a transformer replacement circuit. 2.Explain losses and efficiency in transformers. 	Criteria: Score Value 1 to 4	Lectures, discussions, questions and answers, and practice questions. 2 X 50			0%
4	Explains, vector diagrams, regulation, losses, efficiency and polarity.	<ol style="list-style-type: none"> 1.Explain the vector diagram of a transformer replacement circuit. 2.Explain losses and efficiency in transformers. 	Criteria: Score Value 1 to 4	Lectures, discussions, questions and answers, and practice questions. 2 X 50			0%
5	Able to understand, calculate and analyze the relationship of 3 phase transformers, tap changers and parallel work of transformers	<ol style="list-style-type: none"> 1.Explain the connection of a 3 phase transformer. 2.Explain the tap changer on a transformer. 3.Explain parallel work in transformers. 	Criteria: The score is 1 to 4	Lectures, discussions, questions and answers, and practice questions. 2 X 50			0%
6	Able to understand, calculate and analyze the relationship of 3 phase transformers, tap changers and parallel work of transformers	<ol style="list-style-type: none"> 1.Explain the connection of a 3 phase transformer. 2.Explain the tap changer on a transformer. 3.Explain parallel work in transformers. 	Criteria: The score is 1 to 4	Lectures, discussions, questions and answers, and practice questions. 2 X 50			0%

7	Able to understand, calculate and analyze the relationship of 3 phase transformers, tap changers and parallel work of transformers	1.Explain the connection of a 3 phase transformer. 2.Explain the tap changer on a transformer. 3.Explain parallel work in transformers.	Criteria: The score is 1 to 4	Lectures, discussions, questions and answers, and practice questions. 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
		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.

