

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

Document Code

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Courses				CODE		Course	Family	/					Cred	lit We	ight		SEME	STER	Compi Date	lation
Electrical	l Macl	hine Practicum		2020102136	6								T=2	P=0	ECT	S=3.18	6		July 18	, 2024
AUTHOR	RIZATI	ON		SP Develop	er					Course Cluster Coordinator				Study Coord	Progra inator	ım				
																	Dr. l		akhmav M.T.	vati,
Learning model		Project Based L	earnin	g																
Program		PLO study pro	gram t	that is charg	ged to the co	urse														
Learning Outcome		Program Objec	tives	(PO)																
(PLO)	I	PLO-PO Matrix	[
			P.O																	
	I	O Matrix at the end of each learning stage (Sub-PO)																		
			P	P.O						N	Veek							-	-	
				1	2 3	4	5	6	7	8	9	10	11		12	13	14	15	16	
Short Course Descript	tion	Students demons and synchronous construction, typ motors and syncl with predetermine	s moto es, cha hronou	rs in the fiel aracteristics a s generators	d. Demonstrat and efficiency. in the field. Ec	e theoretic Planning Juipping st	cal con a solut	cepts of tion app	DC n roach	notors, s to the p	synchro roblem	nous m of sele	otors cting	and and I	async Jsing	hronous synchro	motors	, work otors,	ing prin asynchr	ciples, onous
Reference	ces	Main :																		
		 Djoko Ar Fitzgeral Joko, 20 Kadir A. Mislan. 1 M.V. Des Supari M 	 Kadir A. 1999. Mesin Sinkron. Jakarta: Djambatan. Mislan. 1991. Mesin Tak Serempak. Surabaya: University Press IKIP Surabaya. M.V. Deshpande, 1990. Electric Motors: Aplications and Control. Vinayok Cotlagre Shivajinagar, Y. P Chopra. 																	
		oupporters.		I																
Supporti lecturer	ing	Prof. Dr. Joko, M Mahendra Widya																		
Week-	Fina each stag	l abilities of learning e			aluation					Lear Stude	elp Lear ning m nt Assi stimate	ethods gnmen					Learr mate Refere	rials	Asses Weigh	
	(Sub	o-PO)	Ir	ndicator	Criteria a	& Form		C	offline	(offline)		0	nline	(onli	ne)	1			
(1)		(2)		(3)	(4)				(5)					(6)		(7)	8)	5)

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1	Able to carry out preparatory work,	1.Formulate the	Criteria:	Discovery		0%
	testing DC	title of the	1.The cognitive	learningPresentationDiscussionQuestions		
	generator	experiment	domain consists	and answersPracticeAssignmentsReflection		
	characteristics and	(testing)	of 16 items and	6 X 50		
	reporting the results	characteristics	the max score	0,7,00		
	Tesuits	(zero load,	for each item is			
		load,	4, so the total			
		regulator,	max. 64			
		external, and	2.The			
		short circuit)	psychomotor			
		of a DC	domain consists			
		generator	of 8 items and			
		2.Formulate the	the maximum			
		problem	score for each			
		3.Formulate	item is 3, so the			
		goals	total is max. 24 3.The affective			
		4.Formulate				
		variables and	domain consists			
		operational	of 10 items and			
		definitions of variables	the max score for each item is			
		5.Compile a	1.2, so the total			
			is max. 12			
		brief relevant theory	15 IIIdX. 12			
		6.Create a test				
		suite image				
		7.Formulate a				
		hypothesis				
		8.Create a test				
		plan				
		9.Create a data				
		table design				
		for test results				
		10.Conduct				
		experiments				
		11.Collect data				
		on test results				
		12.Create a				
		data table of				
		test results				
		13.Create				
		graphs based				
		on test results				
		14.Carry out				
		interpretation				
		of test result				
		data				
		15.Analyzing				
		test result				
		data				
		16.Concluding				
		the results of				
		test data				
		analysis				
		17.Make follow-				
		up decisions				
		on test results				
		18.Report test				
		results				
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2	Able to carry out	1.Formulate the	Criteria:	Discovery		0%
	preparatory work, testing DC	title of the	1.The cognitive	learningPresentationDiscussionQuestions		
	generator	experiment	domain consists	and answersPracticeAssignmentsReflection		
	characteristics and reporting the	(testing)	of 16 items and the max score	6 X 50		
	results	characteristics (zero load,	for each item is			
		load,	4, so the total			
		regulator,	max. 64			
		external, and	2.The			
		short circuit)	psychomotor			
		of a DC	domain consists			
		generator	of 8 items and			
		2.Formulate the	the maximum			
		problem	score for each			
		3.Formulate goals	item is 3, so the total is max. 24			
		4.Formulate	3.The affective			
		variables and	domain consists			
		operational	of 10 items and			
		definitions of	the max score			
		variables	for each item is			
		5.Compile a	1.2, so the total			
		brief relevant	is max. 12			
		theory				
		 Create a test suite image 				
		7.Formulate a				
		hypothesis				
		8.Create a test				
		plan				
		9.Create a data				
		table design				
		for test results				
		10.Conduct				
		experiments 11.Collect data				
		on test results				
		12.Create a				
		data table of				
		test results				
		13.Create				
		graphs based				
		on test results				
		14.Carry out interpretation				
		of test result				
		data				
		15.Analyzing				
		test result				
		data				
		16.Concluding				
		the results of				
		test data analysis				
		17.Make follow-				
		up decisions				
		on test results				
		18.Report test				
		results				
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3	Able to carry out preparatory work,	1.Formulate the	Criteria: 1.The cognitive	Discovery learningPresentationDiscussionQuestions		0%
	preparatory work, testing DC	title of the experiment	domain consists	and		
	generator characteristics and	(testing)	of 16 items and	answersPracticeAssignmentsReflection		
	reporting the	characteristics	the max score	6 X 50		
	results	(zero load,	for each item is			
		load,	4, so the total			
		regulator,	max. 64 2.The			
		external, and short circuit)	psychomotor			
		of a DC	domain consists			
		generator	of 8 items and			
		2.Formulate the	the maximum			
		problem	score for each			
		3.Formulate	item is 3, so the total is max. 24			
		goals 4.Formulate	3.The affective			
		variables and	domain consists			
		operational	of 10 items and			
		definitions of	the max score			
		variables	for each item is			
		5.Compile a	1.2, so the total is max. 12			
		brief relevant theory	IS MAX. 12			
		6.Create a test				
		suite image				
		7.Formulate a				
		hypothesis				
		8.Create a test plan				
		9.Create a data				
		table design				
		for test results				
		10.Conduct				
		experiments				
		11.Collect data on test results				
		12.Create a				
		data table of				
		test results				
		13.Create				
		graphs based on test results				
		14.Carry out				
		interpretation				
		of test result				
		data				
		15.Analyzing test result				
		data				
		16.Concluding				
		the results of				
		test data				
		analysis				
		17.Make follow- up decisions				
		on test results				
		18.Report test				
		results				
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4	Able to carry out	1.Formulate the	Criteria:	Discovery		0%
1	preparatory work,	title of the	1.The cognitive	learningPresentationDiscussionQuestions		
	testing DC motor	experiment	domain consists	and		
	characteristics and		of 16 items and	answersPracticeAssignmentsReflection		
	reporting the	(testing)		6 X 50		
	results	characteristics	the max score	0,7,00		
		(zero load,	for each item is			
		load,	so the total			
		regulator,	max. 64			
		external and	2.The			
		short circuit)	psychomotor			
		of DC motors	domain consists			
			of 8 items and			
		2.Formulate the				
		problem	the maximum			
		Formulate	score for each			
		goals	item is 3, so the			
		Formulate	total is max. 24			
		variables and	The affective			
		operational	domain consists			
		definitions of	of 10 items and			
		variables	the max score			
		5.Compile a	for each item is			
		brief relevant	1.2, so the total			
		theory	is max. 12			
		Create a test				
		suite image				
		7.Formulate a				
		hypothesis				
		8.Create a test				
		plan				
		Create a data				
		table design				
		for test results				
		10.Conduct				
		experiments				
		11.Collect data				
		on test results				
		12.Create a				
		data table of				
		test results				
		13.Create				
		graphs based				
		on test results				
		14.Carry out				
		interpretation				
		of test result				
		data				
1						
		15.Analyzing				
1		test result				
		data				
1		16.Concluding				
1		the results of				
		test data				
		analysis				
		17.Make follow-				
1		up decisions				
		on test results				
		18.Report test				
		results				
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5	Able to carry out preparatory work, testing DC motor characteristics and reporting the results	 Formulate the title of the experiment (testing) characteristics (zero load, load, regulator, external and short circuit) of DC motors Formulate the problem Formulate the problem Formulate sand operational definitions of variables Compile a brief relevant theory Create a test suite image Formulate a hypothesis Create a test plan Create a data table design for test results Conduct experiments Collect data 	Criteria: 1. The cognitive domain consists of 16 items and the max score for each item is 4, so the total max. 64 2. The psychomotor domain consists of 8 items and the maximum score for each item is 3, so the total is max. 24 3. The affective domain consists of 10 items and the max score for each item is 1.2, so the total is max. 12	Discovery learningPresentationDiscussionQuestions and answersPracticeAssignmentsReflection 6 X 50		0%
		definitions of	of 10 items and			
		5.Compile a	for each item is			
		theory				
		suite image				
		9.Create a data				
		for test results				
		experiments				
		12.Create a data table of				
		test results 13.Create				
		graphs based				
		on test results 14.Carry out				
		interpretation of test result				
		data				
		15.Analyzing test result				
		data 16.Concluding				
		the results of				
		test data analysis				
		17.Make follow- up decisions				
		on test results				
		18.Report test results				

6	Able to carry out preparatory work, testing DC motor characteristics and reporting the results	 Formulate the title of the experiment (testing) characteristics (zero load, load, regulator, external and short circuit) of DC motors Formulate the problem Formulate the goals Formulate variables and operational definitions of variables Compile a brief relevant theory Create a test 	Criteria: 1. The cognitive domain consists of 16 items and the max score for each item is 4, so the total max. 64 2. The psychomotor domain consists of 8 items and the maximum score for each item is 3, so the total is max. 24 3. The affective domain consists of 10 items and the max score for each item is 1.2, so the total is max. 12	Discovery learningPresentationDiscussionQuestions and answersPracticeAssignmentsReflection 6 X 50		0%
		 10.Conduct experiments 11.Collect data on test results 12.Create a data table of test results 13.Create graphs based on test results 14.Carry out interpretation of test result data 15.Analyzing test result data 16.Concluding the results of test data analysis 17.Make follow- up decisions on test results 18.Report test results 				

7 Able to carry out preparatory work, test the characteristics of a single phase 1. Formulate the title of the experiment (testing) 1. Formulate the title of the experiment (testing) Discovery learningPresentationDiscussionQuestions and answersPracticeAssignmentsReflection	0%
test the experiment domain consists and answersPracticeAssignmentsReflection	
characteristics of a single phase (testing) of 16 items and answersPracticeAssignmentsReflection	
single phase (testing) of 16 items and answerspracticeAssignmentsReflection	
Synchronous Characteristics the max score	
generator and (zero load, for each item is	
report the results load, 4, so the total	
regulator, max. 64	
external and 2.The	
short circuit) psychomotor	
of a single domain consists	
phase of 8 items and	
synchronous the maximum	
generator score for each	
2.Formulate item is 3, so the	
goals total is max. 24	
3. Formulate 3. The affective	
variables and domain consists	
operational of 10 items and	
definitions of the max score	
variables for each item is	
4.Compile a 1.2, so the total	
brief relevant is max. 12	
theory	
5.Create a test	
suite image	
6.Formulate a	
hypothesis	
7.Create a test	
plan	
8.Create a data	
table design	
for test results	
9.Conduct	
experiments	
10.Collect data	
on test results	
11.Create a	
data table of	
test results	
12.Create	
graphs based	
on test results	
13.Carry out	
interpretation	
of test result	
data	
14.Analyzing	
test result	
data	
15.Concluding	
the results of	
test data	
analysis	
16.Make follow-	
up decisions	
on test results	
17.Report test	
results	

8	Able to carry out preparatory work,	1.Formulate the	Criteria:	Discovery		0%
	test the	title of the	1.The cognitive	learningPresentationDiscussionQuestions and		
	characteristics of a	experiment	domain consists of 16 items and	answersPracticeAssignmentsReflection		
	single phase synchronous	(testing)	the max score	6 X 50		
	generator and	characteristics (zero load,	for each item is			
	report the results	load,	4, so the total			
		regulator,	max. 64			
		external and	2.The			
		short circuit)	psychomotor			
		of a single	domain consists			
		phase	of 8 items and			
		synchronous	the maximum			
		generator	score for each			
		2.Formulate the	item is 3, so the			
		problem	total is max. 24			
		3.Formulate	3.The affective			
		goals 4.Formulate	domain consists of 10 items and			
		variables and	the max score			
		operational	for each item is			
		definitions of	1.2, so the total			
		variables	is max. 12			
		5.Compile a				
		brief relevant				
		theory				
		Create a test				
		_ suite image				
		7.Formulate a				
		hypothesis				
		8.Create a test				
		plan 9.Create a data				
		table design				
		for test results				
		10.Conduct				
		experiments				
		11.Collect data				
		on test results				
		12.Create a				
		data table of				
		test results				
		13.Create				
		graphs based on test results				
		14.Carry out				
		interpretation				
		of test result				
		data				
		15.Analyzing				
		test result				
		data				
		16.Concluding				
		the results of test data				
		analysis				
		17.Make follow-				
		up decisions				
		on test results				
		18.Report test				
		results				
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9	Able to carry out	1.Formulate the	Criteria:	Discovery		0%
	preparatory work,	title of the	1.The cognitive	learningPresentationDiscussionQuestions		
	test the characteristics of a	experiment	domain consists	and		
	3 phase	(testing)	of 16 items and	answersPracticeAssignmentsReflection		
	synchronous	characteristics	the max score	2 X 50		
	generator and	(zero load,	for each item is			
	report the results	· · ·	4, so the total			
		load,				
		regulator,	max. 64			
		external and	2.The			
		short circuit)	psychomotor			
		of a 3 phase	domain consists			
		synchronous	of 8 items and			
		generator	the maximum			
		2.Formulate the	score for each			
		problem	item is 3, so the			
		3.Formulate	total is max. 24			
		goals	3.The affective			
		4.Formulate	domain consists			
		variables and	of 10 items and			
		operational	the max score			
		definitions of	for each item is			
		variables	1.2, so the total			
		5.Compile a	is max. 12			
		brief relevant				
		theory				
		Create a test				
		suite image				
		7.Formulate a				
		hypothesis				
		8.Create a test				
		plan				
		9.Create a data				
		table design				
		for test results				
		10.Conduct				
		experiments				
		11.Collect data				
		on test results				
		12.Create a				
		data table of				
		test results				
		13.Create				
		graphs based				
		on test results				
		14.Carry out				
		interpretation				
		of test result				
		data				
		15.Analyzing				
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		data				
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1		16.Concluding				
1		the results of				
		test data				
		analysis				
		17.Make follow-				
		up decisions				
		on test results				
		18.Report test				
		results				
		results				
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10	Able to carry out preparatory work, test the characteristics of a 3 phase synchronous generator and report the results	 Formulate the title of the experiment (testing) characteristics (zero load, load, regulator, external and short circuit) of a 3 phase synchronous generator Formulate the problem Formulate the problem Formulate the variables and operational definitions of variables Compile a brief relevant theory Create a test suite image Formulate a hypothesis Create a test suite image for test results Conduct experiments Conduct experiments Create a test suite intersect a test suite intersect a test suite image for test results Create a test suite intersect a test suite image for test results Create a test suite intersect a test suite intersec	Criteria: 1. The cognitive domain consists of 16 items and the max score for each item is 4, so the total max. 64 2. The psychomotor domain consists of 8 items and the maximum score for each item is 3, so the total is max. 24 3. The affective domain consists of 10 items and the max score for each item is 1.2, so the total is max. 12	Discovery learningPresentationDiscussionQuestions and answersPracticeAssignmentsReflection 2 X 50		0%
		on test results 18.Report test results				
11	Able to carry out preparatory work, test the characteristics of a 3 phase asynchronous motor, and report the results		Criteria: 1. The cognitive domain consists of 16 items and the max score for each item is 4, so the total max. 64 2. The psychomotor domain consists of 8 items and the maximum score for each item is 3, so the total is max. 24 3. The affective domain consists of 10 items and the max score for each item is 1.2, so the total is max. 12	Discovery learningPresentationDiscussionQuestions and answersPracticeAssignmentsReflection 2 X 50		0%

12	Able to carry out preparatory work, test the characteristics of a 3 phase asynchronous motor, and report the results	Criteria: 1. The cognitive domain consists of 16 items and the max score for each item is 4, so the total max. 64 2. The psychomotor domain consists of 8 items and the maximum score for each item is 3, so the total is max. 24 3. The affective domain consists of 10 items and the max score for each item is 1.2, so the total is max. 12	Discovery learningPresentationDiscussionQuestions and answersPracticeAssignmentsReflection 2 X 50	0%
13				0%
14				0%
15				0%
16				0%

 Evaluation Percentage Recap: Project Based Learning

 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.
 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
- 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.
- 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.
- 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 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.