



**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 Circuit Practice	99992040102031		T=2 P=0 ECTS=3.18	2	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>	Project Based Learning						
<b>Program Learning Outcomes (PLO)</b>	PLO study program that is charged to the course						
	Program Objectives (PO)						
	PLO-PO Matrix						
		P.O					
<b>Short Course Description</b>	In the practice of DC Electric Circuits, practical work will be carried out regarding: Introduction to Analog Electrical Measuring Instruments, DC Voltage Sources, Operating an Oscilloscope, Ohm's Law and Kirchoff's Law, Series, Parallel and Combination Resistance Relationships, Voltage Dividers, Direct Current Electric Power, Resistor Characteristics, Power Distribution maximum, Bridge Series, Thevenin and Norton Methods, Super Position Method, Triangle Star Transformation, Indirect Resistance Measurement.						
	<b>References</b>	<b>Main :</b> 1. Budiono Mismail. 1994. Rangkaian Listrik. Malang: UNIPRESS Unibraw. 2. Scaum.1998. Rangkaian Litrik I. Jakarta : Erlangga. 3. Theraja B I. 1979. Electrcal Technology. New Delhi: S Chand & Cendany. Ltd.					
	<b>Supporters:</b>						
<b>Supporting lecturer</b>	Mahendra Widyartono, S.T., M.T. Reza Rahmadian, S.ST., M.EngSc. Ayusta Lukita Wardani, 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	<p>1. Able to operate experimental equipment in electrical circuits</p> <p>2. Able to plan solution approaches for RL, RC circuits, analysis of series and parallel RLC circuits, coupled circuits, polyphase circuits</p> <p>3. Students are able to interact and work together in the Electrical Circuits I practice group</p> <p>4. Able responsible for the results of the work of the group under his supervision</p>	<p>Explain the symbols for electrical measuring instruments.</p> <p>Explain data on electrical measuring instruments.</p> <p>Use electrical measuring instruments correctly.</p> <p>Determine the correct measuring limits of electrical measuring instruments when used in measurements.</p> <p>Determine the measurement error of electrical measuring instruments.</p>		2 X 50			0%
2	<p>1. Able to operate experimental equipment in electrical circuits</p> <p>2. Able to plan solution approaches for RL, RC circuits, analysis of series and parallel RLC circuits, coupled circuits, polyphase circuits</p> <p>3. Students are able to interact and work together in the Electrical Circuits I practice group</p> <p>4. Able responsible for the results of the work of the group under his supervision</p>	<p>1.Describes the characteristic curve of a DC voltage source.</p> <p>2.Calculate the value of the internal resistance.</p> <p>3.Compare DC voltage sources in use in terms of capacity and internal resistance.</p>		2 X 50			0%
3	<p>1. Able to operate experimental equipment in electrical circuits</p> <p>2. Able to plan solution approaches for RL, RC circuits, analysis of series and parallel RLC circuits, coupled circuits, polyphase circuits</p> <p>3. Students are able to interact and work together in the I4 Electric Circuit practice group. Able to be responsible for the results of group work under his supervision</p>	<p>1.Can measure the maximum and peak-to-peak voltage of each electrical waveform</p> <p>2.Can measure the frequency</p> <p>3.Can measure phase differences with the two-channel method and the XY method.</p> <p>4.Can measure the frequency comparison of two electric waves.</p>		2 X 50			0%

4	<p>1. Able to operate experimental equipment in electrical circuits</p> <p>2. Able to plan solution approaches for RL, RC circuits, analysis of series and parallel RLC circuits, coupled circuits, polyphase circuits.</p> <p>3. Students are able to interact and work together in the I4 Electric Circuit practice group. Able to be responsible for the results of group work under his supervision</p>	<p>1. Prove the truth of Ohm's law with experiments</p> <p>2. Knowing the relationship between voltage and electric current in a certain resistance</p> <p>3. Know the relationship between current and resistance at a certain voltage</p> <p>4. Proving the truth of Kirchoff's law with experiments</p> <p>5. Determine the value of the current flowing in a branch, if the other branches are known</p>		2 X 50			0%
5	<p>1. Able to operate experimental equipment in electrical circuits</p> <p>2. Able to plan solution approaches for RL, RC circuits, analysis of series and parallel RLC circuits, coupled circuits, polyphase circuits.</p> <p>3. Students are able to interact and work together in the I4 Electrical Circuit practice group. Able to be responsible for the results of group work under his supervision</p>	<p>Can calculate the value of resistance connected in combination based on the formula Can determine the value of replacement resistance in series, parallel and combination connections Can measure voltage and current in a resistance connection</p>		2 X 50			0%

6	<p>1. Able to operate experimental equipment in electrical circuits</p> <p>2. Able to plan solution approaches for RL, RC circuits, analysis of series and parallel RLC circuits, coupled circuits, polyphase circuits.</p> <p>3. Students are able to interact and work together in the I4 Electric Circuit practice group. Able to be responsible for the results of group work under his supervision</p>	<p>1. Able to create a voltage source using a voltage divider system</p> <p>2. Able to draw a graph of the output voltage (<math>V_0</math>), as a function of resistance <math>R_2</math> on the voltage divider without load</p> <p>3. Able to draw voltage divider graphs for: Output voltage (<math>V_0</math>) as a function of load resistance (<math>R_b</math>), output power (<math>P_b</math>) as a function of load resistance</p> <p>4. Can determine the comparative price of resistance <math>R_1</math> and <math>R_2</math>, so that it can distribute maximum power.</p> <p>5. Can determine the voltage comparison value <math>V_0/V</math> as a function of <math>R_2/R_1</math> <math>R_2</math> for load or no load.</p>		2 X 50			0%
7	<p>1. Able to operate experimental equipment in electrical circuits</p> <p>2. Able to plan solution approaches for RL, RC circuits, analysis of series and parallel RLC circuits, coupled circuits, polyphase circuits.</p> <p>3. Students are able to interact and work together in the I4 Electric Circuit practice group. Able to be responsible for the results of group work under his supervision</p>	<p>1. After completing the practical experiment, the student is expected to be able to: Determine the power of resistances connected in series or parallel</p> <p>2. Observe changes in the power of a resistance when the current and voltage change</p>		2 X 50			0%

8	1. Able to operate experimental equipment in electrical circuits 2. Able to plan solution approaches for RL, RC circuits, analysis of series and parallel RLC circuits, coupled circuits, polyphase circuits. 3. Students are able to interact and work together in the I4 Electric Circuit practice group. Able to be responsible for the results of group work under his supervision	Able to solve UTS questions		2 X 50			0%
9							0%
10							0%
11							0%
12							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.
- 3. Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study materials 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.**

