	Universitas Negeri Surabaya Faculty of Engineering , Electrical Engineering Education Undergraduate Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Electrical Workshop	8320102017		T=2	P=0	ECTS=3.18	4	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	Dr. Nur Kholis, S.T., M.T.

Learning model	**Project Based Learning**
Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**
PLO-14	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)
	Program Objectives (PO)
	PLO-PO Matrix

P.O	PLO-14

PO Matrix at the end of each learning stage (Sub-PO)

P.O	Week															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Short Course Description	Students are able to understand SOPs and create a culture of occupational health and safety (K3) in electrical workshops; able to optimize the use of equipment and tools, as well as materials in the electrical workshop to assemble, disassemble electrical/electronic components of electrical equipment, carry out basic mechanical work repairing electrical equipment; have the management ability to procure electrical workshop materials and manage the work of making finished goods needed for the electrical and electronics lab; have the ability to manage maintenance of electrical workshop equipment and tools, and be able to carry out damage inspections to electrical workshop equipment, carry out maintenance and repairs on electrical workshop equipment.
References	**Main :**

1. Buctami Achir. 1985. Perencanaan Kebutuhan Fasilitas Pelajaran Praktek dan Optimasi Pemakaiannya . Bandung: P3GT, Depdikbud
2. Grummy A. dan I Made Mulyatna. 1990. Petunjuk Praktek Dasar . Surabaya: Unipres, IKIP Surabaya
3. Joko. 2004. Pemeliharaan dan perbaikan mesin-mesin listrik . Jurusan Teknik Elektro Fakultas Teknik Unesa Surabaya, Surabaya
4. Kavanaugh, William A. 1982. Consideration . When Planning Electricity Electronic Shop, in Modern School Shop Planning
5. Supari M. 2009. Pembangkitan Tenaga Listrik . BNSP Depdiknas, Jakarta
6. Sumiarsih. 1984. Transformator 1 phasa . Univercity Press Unesa, Surabaya
7. Tim. 2013. Standar Operasional Prosedur (SOP) Bengkel Listrik . Jurusan Teknik Elektro Fakultas Teknik Unesa Surabaya

Supporters:	
Supporting lecturer	Ibrohim, S.T., M.T. Dr. Subuh Isnur Haryudo, 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	Collaboratively, students study, discuss, draw conclusions, make reports, demonstrate electrical workshop SOPs, and report in writing and orally	1. Mention documents and standard operating procedures (SOP) for the procurement of light equipment and consumables based on the results of the electrical workshop SOP study 2. Explain documents and SOPs for electrical workshop maintenance based on the results of the study of electrical workshop maintenance SOPs 3. Describe documents and SOPs for order processing and practical parts based on the results of the electrical workshop SOP study 4. Explain the SOP for the use and use of electrical workshops based on the results of the study of electrical workshop SOPs 5. Explain the types of supporting formats for electrical workshop SOPs 6. Outlines the SOP for maintenance of electrical workshop space, equipment, facilities and infrastructure 7. Describe the organizational structure, job description, and electrical workshop rules 8. Demonstrate SOPs for the use of electrical workshop equipment, hand tools; machine tools (using electric power); electrical measuring instruments, and K3 tools	**Criteria:** 1. The cognitive domain consists of 7 assessment items with a maximum score of 4 for each item, so the maximum score is 4. 28 2. The psychomotor domain consists of 6 assessment items with a maximum score for each item. 9, so the max score. 54 3. The affective domain consists of 10 assessment items with a maximum score for each item. 1.8, so the max score. 18 4. Total max score is 100	Direct learning model Presentation Discussion Demonstration Reflection 6 X 50			0%

2	Students have the ability to create a culture of occupational health and safety (K3)	1. Describe the types of work equipment and their functions 2. Describe the types of first aid for work accidents 3. Carry out first aid measures for work accidents 4. Carrying out work in an electrical workshop using work equipment 5. Use work equipment by complying with tool SOPs 6. Use materials according to SOP materials 7. Operate work safety equipment (fire extinguishers) 8. Keep the work environment clean 9. Clean the work environment 10. Avoid spills of flammable materials 11. Avoid spills of slippery materials 12. Clean up remaining materials and return and/or store materials in their place 13. Obey prohibitory signs in electrical workshops	**Criteria:** 1. The cognitive domain consists of 2 assessment items with a maximum score of 15 for each item, so that the maximum score. 30 2. The psychomotor domain consists of 10 assessment items with a maximum score for each item. 5, so the max score. 50 3. The affective domain consists of 10 assessment items with a maximum score for each item. 2, so the max score. 20 4. Total max score is 100	Direct learning Presentation, Discussion, Demonstration, assignment Reflection, Demonstration of K3 implementation by students 6 X 50			0%
3	Students have the ability to optimize the use of equipment, tools and materials in electrical workshops	1. Select tools (type, specifications, units and quantity) according to needs 2. Select materials (type, specifications, units and quantities) according to needs 3. Select equipment spare parts (type, specifications, units and quantity) according to needs 4. Use tools according to tool needs and SOP 5. Use materials according to material requirements and SOP 6. Maintain equipment and return it to its place 7. Return the remaining materials to their place 8. Make written and oral reports	**Criteria:** 1. The psychomotor domain consists of 8 assessment items with a maximum score for each item. 10, so the max score is 80 2. The affective domain consists of 10 assessment items with a maximum score for each item. 2, so the max score. 20 3. Total max score is 100	Hands-on learningPresentationDiscussionDemonstrationReflection 6 X 50			0%

4	Students have management skills to design the manufacture of finished goods for electrical and electronics lab needs (Power Supply)	1. Planning a single phase transformer 2. Make a design drawing for making a single phase transformer 3. Determine the need for tools and materials	**Criteria:** 1. The cognitive domain consists of 6 assessment items with a maximum score of 9 for each item, so the maximum score is 9. 54 2. The psychomotor domain consists of 4 assessment items with a maximum score for each item. 8, so the max score. 32 3. The affective domain consists of 10 assessment items with a maximum score for each item. 1.4, so the max score. 14 4. Total max score is 100	Project-based learningPresentationDiscussionReflectionAssignment 6 X 50			0%
5	Students have management skills to design the manufacture of finished goods for electrical and electronics lab needs (Power Supply)	1. Planning a single phase transformer 2. Make a design drawing for making a single phase transformer 3. Determine the need for tools and materials	**Criteria:** 1. The cognitive domain consists of 6 assessment items with a maximum score of 9 for each item, so the maximum score is 9. 54 2. The psychomotor domain consists of 4 assessment items with a maximum score for each item. 8, so the max score. 32 3. The affective domain consists of 10 assessment items with a maximum score for each item. 1.4, so the max score. 14 4. Total max score is 100	Project-based learningPresentationDiscussionReflectionAssignment 6 X 50			0%
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8	Students have management skills to carry out work making single phase transformer coils	1. Planning to manufacture a single phase transformer coker 2. Make drawings of designs for making transformer coils 3. Determine the need for tools and materials	**Criteria:** 1. The cognitive domain consists of 6 assessment items with a maximum score of 9 for each item, so the maximum score is 9. 54 2. The psychomotor domain consists of 4 assessment items with a maximum score for each item. 8, so the max score. 32 3. The affective domain consists of 10 assessment items with a maximum score for each item. 1.4, so the max score. 14 4. Total max score is 100	Project-based learningPresentationDiscussionReflectionAssignment 6 X 50			0%
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11	Students have management skills to carry out installation work, make connections, test the results of winding connections, carry out performance testing of single phase transformer products produced, and report in writing and orally	1. Planning the winding installation on the cocker 2. Make design drawings for installing the windings on the coker, connecting the windings to the connector, and testing 3. Determine the need for tools and materials 4. Installing the windings on the transformer coil 5. Connecting and soldering the ends of the windings on the connectors 6. Test the results of the winding connections on the connector 7. Carry out performance testing of the products produced 8. Evaluate and improve the products produced 9. Report work results in writing and orally	**Criteria:** 1. The cognitive domain consists of 7 assessment items with a maximum score of 8 for each item, so that the maximum score. 56 2. The psychomotor domain consists of 10 assessment items with a maximum score for each item. 3,, so the max score. 30 3. The affective domain consists of 10 assessment items with a maximum score for each item. 1.4, so the max score. 14 4. Total max score is 100	Project-based learningPresentationDiscussionReflectionAssignment 6 X 50			0%

12	Students have management skills to carry out installation work, make connections, test the results of winding connections, carry out performance testing of single phase transformer products produced, and report in writing and orally	1. Planning the winding installation on the cocker 2. Make design drawings for installing the windings on the coker, connecting the windings to the connector, and testing 3. Determine the need for tools and materials 4. Installing the windings on the transformer coil 5. Connecting and soldering the ends of the windings on the connectors 6. Test the results of the winding connections on the connector 7. Carry out performance testing of the products produced 8. Evaluate and improve the products produced 9. Report work results in writing and orally	**Criteria:** 1. The cognitive domain consists of 7 assessment items with a maximum score of 8 for each item, so that the maximum score. 56 2. The psychomotor domain consists of 10 assessment items with a maximum score for each item. 3,, so the max score. 30 3. The affective domain consists of 10 assessment items with a maximum score for each item. 1.4, so the max score. 14 4. Total max score is 100	Project-based learningPresentationDiscussionReflectionAssignment 6 X 50			0%
13	Students have management skills to carry out installation work, make connections, test the results of winding connections, carry out performance testing of single phase transformer products produced, and report in writing and orally	1. Planning the winding installation on the cocker 2. Make design drawings for installing the windings on the coker, connecting the windings to the connector, and testing 3. Determine the need for tools and materials 4. Installing the windings on the transformer coil 5. Connecting and soldering the ends of the windings on the connectors 6. Test the results of the winding connections on the connector 7. Carry out performance testing of the products produced 8. Evaluate and improve the products produced 9. Report work results in writing and orally	**Criteria:** 1. The cognitive domain consists of 7 assessment items with a maximum score of 8 for each item, so that the maximum score. 56 2. The psychomotor domain consists of 10 assessment items with a maximum score for each item. 3,, so the max score. 30 3. The affective domain consists of 10 assessment items with a maximum score for each item. 1.4, so the max score. 14 4. Total max score is 100	Project-based learningPresentationDiscussionReflectionAssignment 6 X 50			0%

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15	Students have management skills to carry out installation work, make connections, test the results of winding connections, carry out performance testing of single phase transformer products produced, and report in writing and orally	1. Planning the winding installation on the cocker 2. Make design drawings for installing the windings on the coker, connecting the windings to the connector, and testing 3. Determine the need for tools and materials 4. Installing the windings on the transformer coil 5. Connecting and soldering the ends of the windings on the connectors 6. Test the results of the winding connections on the connector 7. Carry out performance testing of the products produced 8. Evaluate and improve the products produced 9. Report work results in writing and orally	**Criteria:** 1. The cognitive domain consists of 7 assessment items with a maximum score of 8 for each item, so that the maximum score. 56 2. The psychomotor domain consists of 10 assessment items with a maximum score for each item. 3,, so the max score. 30 3. The affective domain consists of 10 assessment items with a maximum score for each item. 1.4, so the max score. 14 4. Total max score is 100	Project-based learningPresentationDiscussionReflectionAssignment 6 X 50			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 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** 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.
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.