	Universitas Negeri Surabaya Vocational Faculty, D4 Electrical Engineering Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Electrical Workshop	99992040102031		T=2	P=0	ECTS=3.18	1	August 7, 2023

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
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Learning model: Project Based Learning

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)

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 management skills in procuring electrical workshop materials and management in carrying out work to make finished goods needed for the electrical lab; have the ability to manage maintenance of electrical workshop equipment and tools, and be able to inspect damage to electrical workshop equipment, carry out maintenance and repair of electrical workshop work equipment.

References

Main :

1. Tim. (2019). Standar Operasional Prosedur (SOP) Bengkel Listrik . Jurusan Teknik Elektro Fakultas Teknik Unesa Surabaya
2. Ridwan. (2023). Buku ajar pengelolaan laboratorium dan bengkel pendidikan teknik elektro. Eureka Media Aksara: Purbalingga
3. Depdiknas, (2003). Modul penggunaan_peralatan_bengkel. Bagian Proyek Pengembangan Kurikulum Direktorat Pendidikan Menengah Kejuruan Direktorat Jenderal Pendidikan Dasar Dan Menengah Departemen Pendidikan Nasional
4. Kemdikbud, (2013). Pekerjaan dasar elektromekanik. Jakarta, Kemdikbud

Supporters:

1. Joko, (2021). Handout bengkel listrik. Program Studi Pendidikan Teknik Elektro. Surabaya, Universitas Negeri Surabaya
2. Mutaqin, Tindakan kesehatan dan keamanan kerja (K3) di bengkel listrik. Yogyakarta, Universitas Negeri Jakarta
3. ATE210, (2012). Electrical Workshop. Academic Services Unit
4. Peraturan perundangan K3 Listrik. Direktorat Pengawasan Keselamatan Kerja Ditjen Pembinaan Pengawasan Ketenagakerjaan Dep. Tenaga Kerja Dan Transmigrasi Ri
5. Joko, 2022. Transformer. Surabaya, Unesa

Supporting lecturer: Prof. Dr. Joko, M.Pd., M.T.
Aditya Chandra Hermawan, S.ST., 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 and draw conclusions about the meaning, function, management components, infrastructure, management, organization, practical equipment/electrical workshop facilities	Describe the meaning, function, management components, infrastructure, management, organization, practical equipment/electrical workshop facilities	**Criteria:** 1.Accuracy in description, max score 50 2.Participative, score 50 **Form of Assessment** : Participatory Activities, Portfolio Assessment	Presentations, discussions and assignments 2 X 50		**Material:** Definition of an Electrical Workshop **Reader:** *Ridwan. (2023). Textbook for managing laboratories and workshops in electrical engineering education. Eureka Media Script: Purbalingga*	5%

2	Collaboratively, students study, discuss and draw conclusions about the meaning, function, management components, infrastructure, management, organization, practical equipment/electrical workshop facilities	Describe the meaning, function, management components, infrastructure, management, organization, practical equipment/electrical workshop facilities	**Criteria:** 1. Accuracy in description, max score 50 2. Participative, score 50 **Form of Assessment** : Participatory Activities, Portfolio Assessment	Presentations, discussions and assignments 2 X 50		**Material:** Definition of an Electrical Workshop **Reader:** *Ridwan. (2023). Textbook for managing laboratories and workshops in electrical engineering education. Eureka Media Script: Purbalingga*	4%
3	Able to create a culture of occupational health and safety (K3)	1. Describe PPE and its function 2. Describe the types of first aid for work accidents 3. Describe the use of fire extinguishers 4. Describe how to keep the workshop environment clean and safe 5. Describe prohibited/dangerous signs in electrical workshops 6. Participative	**Criteria:** 1. Accurate and correct description, max score 50 2. Participative, minimum 50 **Form of Assessment** : Participatory Activities, Portfolio Assessment	Presentations, discussions and assignments 2 X 50		**Material:** Occupational health and safety in electrical workshops **Reference:** *Electrical K3 legislation. Directorate of Work Safety Inspection Directorate General of Labor Inspection Development Dep. Ri's Labor and Transmigration*	4%
4	Understand the Standard Operating Procedures (SOP) for electrical workshops	1. Review documents and describe electrical workshop SOPs regarding procurement of light tools and materials 2. Review documents and describe SOPs for electrical workshop maintenance 3. Review documents and describe SOPs for order processing and practical parts 4. Review documents and describe SOPs for the use and utilization of electrical workshops 5. Review documents and describe SOPs for equipment/infrastructure maintenance 6. Review documents and describe the organizational structure and job description 7. Review documents and describe SOPs for work equipment and electrical workshop measurements 8. Review documents and describe SOPs for K3 equipment and PPE 9. Participative	**Criteria:** 1. Accuracy of study results and descriptions, max score 50 2. Participative, min score. 50 **Form of Assessment** : Participatory Activities, Portfolio Assessment	Presentations, discussions and assignments 2 X 50		**Material:** Electrical Workshop SOP **Reference:** *Team. 2019. Standard Operating Procedures (SOP) for Electrical Workshops. Department of Electrical Engineering, Faculty of Engineering, Unesa Surabaya*	4%
5	Students have the ability to understand health safety and prepare for metal work	1. 1. Analyze and conclude material on safe behavior and attitudes, workshop maintenance, safe environment, personal protection, safe use of hand and power tools, firefighting 2. 2. Analyze and conclude material on interpretation of wireframe drawings, hand tools for marking workpieces, marking on metal plates 3. 3. Participative	**Criteria:** 1. Accuracy of analysis results and summarizing indicator 1, max score. 25 2. Accuracy of analysis results and summarizing indicator 1, max score. 25 3. Participative, min score 50 **Form of Assessment** : Participatory Activities, Portfolio Assessment		1. Searching for sources of information, discussion, reflection and concluding material on occupational safety and health in electrical workshops to present the results in groups 2. Searching for sources of information, discussion, reflection and concluding material on preparing metal work to present the results in groups online without a lecturer and recorded 2 X 50	**Material:** Occupational health safety and preparing for metal work **Reference:** *Ministry of Education and Culture, (2013). Basic electromechanical work. Jakarta, Ministry of Education and Culture*	4%

6	Have the ability to understand workmanship and assemble metal plates	1.1. Analyze and conclude about cutting, drilling, planing, smoothing and folding metal plates 2.2. Analyze and conclude installation materials, installation equipment, and metal plate installation techniques 3.3. Participative	**Criteria:** 1.Accuracy of analysis results and summarizing indicator 1, max score. 25 2.Accuracy of analysis results and summarizing indicator 1, max score. 25 3.Participative, min score 50 **Form of Assessment** : Participatory Activities, Portfolio Assessment		1. Explore sources of information, discuss, reflect and conclude material on metal plate work to present the results in groups . 2. Explore sources of information, discuss, reflect and conclude material on assembling metal plates to present results in groups. 1 & 2 group discussions and recorded without lecturer 2 X 50	**Material:** Occupational health safety and preparing for metal work **Reference:** *Ministry of Education and Culture, (2013). Basic electromechanical work. Jakarta, Ministry of Education and Culture*	5%
7	Able to work on projects making panel boxes from metal plates	1.Occupational health safety 2.Preparing for work 3.Doing work 4.Testing work results 5.Reporting work results 6.Participative	**Criteria:** 1.Heed K3, max score 5 2.Accuracy in preparing work, max score 10 3.Accuracy in carrying out work, maximum score 20 4.Accuracy of testing work results, max score 10 5.Accuracy of reporting work results, max score 5 6.Participative, min score 50 **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Presentations, discussions, making plans, preparing schedules, working on work, testing project results, and reporting work results 2 X 50		**Material:** Working on metal plates **Reference:** *Ministry of Education and Culture, (2013). Basic electromechanical work. Jakarta, Ministry of Education and Culture*	5%
8	UTS		**Form of Assessment** : Participatory Activities, Tests	UTS 2 X 50	UTS student PPT presentation material that has not been presented with the lecturer (Materials 5 and 6		15%
9	Able to work on projects making panel boxes from metal plates	1.Occupational health safety 2.Preparing for work 3.Doing work 4.Testing work results 5.Reporting work results 6.Participative	**Criteria:** 1.Heed K3, max score 5 2.Accuracy in preparing work, max score 10 3.Accuracy in carrying out work, maximum score 20 4.Accuracy of testing work results, max score 10 5.Accuracy of reporting work results, max score 5 6.Participative, min score. 50 **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Presentations, discussions, making plans, preparing schedules, working on work, testing project results, and reporting work results 2 X 50		**Material:** Working on a panel box product project **Reference:** *Ministry of Education and Culture, (2013). Basic electromechanical work. Jakarta, Ministry of Education and Culture*	6%
10	Able to work on projects making panel boxes from metal plates	1.Occupational health safety 2.Preparing for work 3.Doing work 4.Testing work results 5.Reporting work results 6.Participative	**Criteria:** 1.Heed K3, max score 5 2.Accuracy in preparing work, max score 10 3.Accuracy in carrying out work, maximum score 20 4.Accuracy of testing work results, max score 10 5.Accuracy of reporting work results, max score 5 6.Participative, min score. 50 **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Presentations, discussions, making plans, preparing schedules, working on work, testing project results, and reporting work results 2 X 50		**Material:** Working on a panel box product project **Reference:** *Ministry of Education and Culture, (2013). Basic electromechanical work. Jakarta, Ministry of Education and Culture*	4%

11	Able to make plans, design drawings and schedule activities for making single phase transformer products	1.Make a plan 2.Create image designs 3.Make a work schedule 4.Reporting work results 5.Participative	**Criteria:** 1.Accuracy of project design, max score 20 2.Image design accuracy, max score 20 3.Accuracy of work schedule, max score 5 4.Accuracy of reporting work results, max score 5 5.Participative, min score. 50 **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment		Presentations, discussions, making plans, making designs, preparing activity schedules for making single-phase transformer products, and reporting results in groups 2 X 50	**Material:** Making a single phase transformer **Reference:** *Joko, 2022. Transformer. Surabaya, Unesa*	4%
12	Able to make plans, design drawings and schedule activities for making single phase transformer products	1.Doing preparatory work 2.Create work 3.Testing work results 4.Reporting work results 5.Participative	**Criteria:** 1.Accuracy of preparatory work, max score 10 2.Accuracy of doing work, max score 30 3.Accuracy of testing work results, max score 5 4.Accuracy of reporting work results, max score 5 5.Participative, min score. 50 **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Discuss, work on, test and report the results of the 2 X 50 project work		**Material:** Making a single phase transformer **Reference:** *Joko, 2022. Transformer. Surabaya, Unesa*	4%
13	Able to make plans, design drawings and schedule activities for making single phase transformer products	1.Doing preparatory work 2.Create work 3.Testing work results 4.Reporting work results 5.Participative	**Criteria:** 1.Accuracy of preparatory work, max score 10 2.Accuracy of doing work, max score 30 3.Accuracy of testing work results, max score 5 4.Accuracy of reporting work results, max score 5 5.Participative, min score. 50 **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Discuss, work on, test and report the results of the 2 X 50 project work		**Material:** Making a single phase transformer **Reference:** *Joko, 2022. Transformer. Surabaya, Unesa*	4%
14	Able to make plans, design drawings and schedule activities for making single phase transformer products	1.Doing preparatory work 2.Create work 3.Testing work results 4.Reporting work results 5.Participative	**Criteria:** 1.Accuracy of preparatory work, max score 10 2.Accuracy of doing work, max score 30 3.Accuracy of testing work results, max score 5 4.Accuracy of reporting work results, max score 5 5.Participative, min score. 50 **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Discuss, work on, test and report the results of the 2 X 50 project work		**Material:** Making a single phase transformer **Reference:** *Joko, 2022. Transformer. Surabaya, Unesa*	6%

15	Able to make plans, design drawings and schedule activities for making single phase transformer products	1.Doing preparatory work 2.Create work 3.Testing work results 4.Reporting work results 5.Participative	**Criteria:** 1.Accuracy of preparatory work, max score 10 2.Accuracy of doing work, max score 30 3.Accuracy of testing work results, max score 5 4.Accuracy of reporting work results, max score 5 5.Participative, min score. 50 **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Discuss, work on, test and report the results of the 2 X 50 project work		**Material:** Making a single phase transformer **Reference:** *Joko, 2022. Transformer. Surabaya, Unesa*	6%
16			**Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Tests	UAS 2 X 50			20%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	46.67%
2.	Project Results Assessment / Product Assessment	26.17%
3.	Portfolio Assessment	13%
4.	Test	14.17%
		100%

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** 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.