UNESA	**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
Electric Power System Protection	8320103144		**T=3**	**P=0**	**ECTS=4.77**	5	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**
	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	This course provides knowledge and insight into Protection Philosophy, which includes the rationale, understanding and function of protection, types of disturbances and their prevention, primary and backup safeguards; Protection Relays, including the definition, function and requirements of relays, static and mechanical relays; Overcurrent Relay; definition, working principles, types, configuration, use; Distance Relay, including working principles, types, configuration, use; Differential Relays, including working principles, types, configuration, use; Voltage Relay, including, working principles, types, configuration, use; Power Relays, including working principles, types, configuration, use; Directional Relays, including working principles, types, configuration, use; Power Breaker; Generator Protection, including types of interference, protection devices, configuration & working systems; Transformer Protection, including types of interference, protection devices, configuration & working systems; Transmission Network Protection, including types of interference, protection devices, configuration & working systems; Distribution Network Protection, including types of interference, protection devices, configuration & work systems; Motor Protection, including types of interference, protection devices, configuration & working systems.
References	**Main :**

1. 1. Christophe Prévé. 2006. Protection of Electrical Networks . London : ISTE,Ltd. 2. Edy Supriyadi, 2000. Sistem Proteksi Tenaga Listrik. Yogyakarta: Adi Cita. 3. Info Energi. 2007. Interkoneksi Sumatera-Jawa, Investasi Strategis yang Selalu Tertunda. 4. http://infoenergi.wordpress.com/2007/04/05/interkoneksi-sumatera-jawa-investasi-strategis-yang-selalu-tertunda/ 5. Indonesian Commercial Newsletter. 2008. Market Intelligence Report On Industri 6. Kelistrikan di Indonesia. http://www.datacon.co.id/Listrik2008Ind.html 7. Lewis Blackburn & Thomas J. Domin. 2006. Protective Relaying: Principles and Applications. Taylor&Francis Group,LLC.

Supporters:	
Supporting lecturer	Dr. Ir. Achmad Imam Agung, M.Pd.

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	Understand the basic introduction to STL Protection, issues in PSTL, benefits, and goals	Able to explain the basics of STL Protection, problems in PSTL, benefits and objectives	**Criteria:** 1. STL Protection Basics 2. è Electricity has a vital and strategic role, its availability must meet the aspects of being reliable, safe and environmentally friendly. 3. è The reliability of the electric power system is determined by the electrical installation system and construction that meets the applicable provisions and requirements. 4. è The security of an electric power system is determined by a good, correct, reliable or appropriate protection system according to the needs of the existing system. 5. Meaning/definition: 6. Protection: protection/safety. 7. Electric power system: a system consisting of several sub-systems, namely: generation (electric power generation), distribution (transmission), distribution (distribution) and utilization installation. 8. Electric power system protection: protection/safety of generation (electric power generation), distribution (transmission), distribution (distribution) and utilization installations.	Lectures, discussions and questions and answers 3 X 50			0%

2	Understand the basic introduction to STL Protection, issues in PSTL, benefits, and goals	Able to explain the basics of STL Protection, problems in PSTL, benefits and objectives	**Criteria:** 1. STL Protection Basics 2. è Electricity has a vital and strategic role, its availability must meet the aspects of being reliable, safe and environmentally friendly. 3. è The reliability of the electric power system is determined by the electrical installation system and construction that meets the applicable provisions and requirements. 4. è The security of an electric power system is determined by a good, correct, reliable or appropriate protection system according to the needs of the existing system. 5. Meaning/definition: 6. Protection: protection/safety. 7. Electric power system: a system consisting of several sub-systems, namely: generation (electric power generation), distribution (transmission), distribution (distribution) and utilization installation. 8. Electric power system protection: protection/safety of generation (electric power generation), distribution (transmission), distribution (distribution) and utilization installations.	Lectures, discussions and questions and answers 3 X 50			0%
3	Understand the types of disorders and how to deal with them	Able to explain disorders and how to handle them	**Criteria:** Full marks are obtained if you do all the questions correctly	Lectures, discussions, exercises 3 X 50			0%
4	Understand the types of disorders and how to deal with them	Able to explain disorders and how to handle them	**Criteria:** Full marks are obtained if you do all the questions correctly	Lectures, discussions, exercises 3 X 50			0%
5	Understand how to generate and test high voltage AC high frequency	Able to explain Curent Transformer work, functions and applications and Power Transformer functions and applications	**Criteria:** Full marks are obtained if you do all the questions correctly	Lectures, discussions, exercises 3 X 50			0%

6	Understand how to generate and test high voltage AC high frequency	Able to explain Curent Transformer work, functions and applications and Power Transformer functions and applications	**Criteria:** Full marks are obtained if you do all the questions correctly	Lectures, discussions, exercises 3 X 50			0%
7	Understand how to generate and test high voltage AC high frequency	Able to explain Curent Transformer work, functions and applications and Power Transformer functions and applications	**Criteria:** Full marks are obtained if you do all the questions correctly	Lectures, discussions, exercises 3 X 50			0%
8							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 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.