



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

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date																																
Optimum Operation and Reliability of Electric Power Systems	2020102096		T=2	P=0	ECTS=3.18	6	July 18, 2024																																
AUTHORIZATION	SP Developer		Course Cluster Coordinator			Study Program Coordinator																																	
			Dr. Lusia Rakhmawati, S.T., M.T.																																	
Learning model	Case Studies																																						
Program Learning Outcomes (PLO)	PLO study program that is charged to the course																																						
	Program Objectives (PO)																																						
	PLO-PO Matrix																																						
		P.O																																					
Short Course Description	Process of delivering an interconnected electric power system, Characteristics of power plants, Scheduling system maintenance and operations, System reliability calculating LOLP (Loss of Load Probability), Load distribution of generating units, Hydro thermal optimization, Plant constraints, System security, Operation control																																						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2" style="width: 10%; text-align: center;">P.O</td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 5%; text-align: center;">2</td> <td style="width: 5%; text-align: center;">3</td> <td style="width: 5%; text-align: center;">4</td> <td style="width: 5%; text-align: center;">5</td> <td style="width: 5%; text-align: center;">6</td> <td style="width: 5%; text-align: center;">7</td> <td style="width: 5%; text-align: center;">8</td> <td style="width: 5%; text-align: center;">9</td> <td style="width: 5%; text-align: center;">10</td> <td style="width: 5%; text-align: center;">11</td> <td style="width: 5%; text-align: center;">12</td> <td style="width: 5%; text-align: center;">13</td> <td style="width: 5%; text-align: center;">14</td> <td style="width: 5%; text-align: center;">15</td> <td style="width: 5%; text-align: center;">16</td> </tr> </table>							P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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Supporters:																																							
Supporting lecturer	Unit Three Kartini, S.T., M.T., Ph.D.																																						
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	Able to understand the process of delivering electric power systems	<p>1.Explain the basics of electric power systems</p> <p>2.Explain the interconnection system and operation management of the electric power system</p>	<p>Criteria:</p> <p>1.The assessment criteria are carried out by looking at aspects:</p> <p>2.1. Participation: carried out by observing student activities (weight 2)</p> <p>3.2. UTS: carried out with an assessment during the middle of the semester (weight 2)</p> <p>4.3. UAS: carried out every semester to measure all indicators (weight 3)</p> <p>5.4. Task: carried out on each indicator (weight 3)</p> <p>6.Student Final Grade:</p> <p>7.Participation Score (2) x Lever Score (3) x UTS Score (2) x UAS Score (3) divided by 10.</p>	Presentation, group discussion and reflection 2 X 50			0%
2	Students are able to plan scheduling and constraints of the electric power system	<p>Calculating the effect of adding and subtracting generating units on system reliability -</p> <p>Calculating the possibility of losing LOLP loads -</p> <p>Explaining operation planning and system load analysis</p>	<p>Criteria:</p> <p>1.The assessment criteria are carried out by looking at aspects:</p> <p>2.1. Participation: carried out by observing student activities (weight 2)</p> <p>3.2. UTS: carried out with an assessment during the middle of the semester (weight 2)</p> <p>4.3. UAS: carried out every semester to measure all indicators (weight 3)</p> <p>5.4. Task: carried out on each indicator (weight 3)</p> <p>6.Student Final Grade:</p> <p>7.Participation Score (2) x Lever Score (3) x UTS Score (2) x UAS Score (3) divided by 10.</p>	Presentation, discussion and practice 2 X 50			0%

3	Students are able to plan scheduling and constraints of the electric power system	Calculating the effect of adding and subtracting generating units on system reliability - Calculating the possibility of losing LOLP loads - Explaining operation planning and system load analysis	Criteria: 1.The assessment criteria are carried out by looking at aspects: 2.1. Participation: carried out by observing student activities (weight 2) 3.2. UTS: carried out with an assessment during the middle of the semester (weight 2) 4.3. UAS: carried out every semester to measure all indicators (weight 3) 5.4. Task: carried out on each indicator (weight 3) 6.Student Final Grade: 7.Participation Score (2) x Lever Score (3) x UTS Score (2) x UAS Score (3) divided by 10.	Presentation, discussion and practice 2 X 50			0%
4	Students are able to understand the burden of scheduling and understand methods	1.Calculate and analyze system fuel costs 2.Explain loading and methods for calculating LOLP	Criteria: 1.The assessment criteria are carried out by looking at aspects: 2.1. Participation: carried out by observing student activities (weight 2) 3.2. UTS: carried out with an assessment during the middle of the semester (weight 2) 4.3. UAS: carried out every semester to measure all indicators (weight 3) 5.4. Task: carried out on each indicator (weight 3) 6.Student Final Grade: 7.Participation Score (2) x Lever Score (3) x UTS Score (2) x UAS Score (3) divided by 10.	Presentation, group discussion and practice 2 X 50			0%

5	Students understand scheduling and loading methods	1. Calculate and analyze system fuel costs 2. Explain loading and methods for calculating LOLP	Criteria: 1. The assessment criteria are carried out by looking at aspects: 2.1. Participation: carried out by observing student activities (weight 2) 3.2. UTS: carried out with an assessment during the middle of the semester (weight 2) 4.3. UAS: carried out every semester to measure all indicators (weight 3) 5.4. Task: carried out on each indicator (weight 3) 6. Student Final Grade: 7. Participation Score (2) x Lever Score (3) x UTS Score (2) x UAS Score (3) divided by 10.	Presentation, group discussion and practice 2 X 50			0%
6	UTS			2 X 50			0%
7							0%
8							0%
9							0%
11							0%
12							0%
13							0%
14							0%
15							0%
16							0%

Evaluation Percentage Recap: Case Study

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** 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.