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

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Solar Technology	2120102097		T=2	P=0	ECTS=3.18	7	July 18, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	Ir. Priyo Heru Adiwibowo, 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

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	Understanding of radiation heat transfer caused by sunlight and parameters relating to solar radiation falling on the earth's surface, as well as applications for the use of solar energy
References	**Main :**
	1. John A. Duffie and William A. Beckman, 2006. *Solar Engineering of Thermal Process 3rd edition* , JohnWiley and Sons, 2006 Bahan-bahan dari Internetdan kepustakaan lain
	Supporters:
Supporting lecturer	

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	Students can find out the properties and characteristics of solar energy	Students are able to explain the nature and characteristics of solar energy		lectures and discussions 2 X 50			0%

2	students can utilize the potential of solar energy	Students can explain the use of solar energy	**Criteria:** null	lecture, discussion 2 X 50			0%
3	Students can find out the factors that influence solar radiation to the earth	Students can explain the factors that influence solar radiation to the earth	**Criteria:** null	lecture, discussion 2 X 50			0%
4	Students can calculate solar energy radiation that reaches the earth	Students are able to calculate solar energy radiation that reaches the earth	**Criteria:** null	lectures, discussions, assignments 2 X 50			0%
5	Students can calculate solar energy radiation that reaches the earth	Students are able to calculate solar energy radiation that reaches the earth	**Criteria:** null	lectures, discussions, assignments 2 X 50			0%
6	students know solar power technology with generation I solar cells	Students can explain solar power technology with generation I solar cells	**Criteria:** 60% correct answers	lectures, discussions and assignments 2 X 50			0%
7	students know solar power technology with generation II solar cells	Students can explain solar power technology with generation II solar cells	**Criteria:** 60% correct answers	lectures, discussions and assignments 2 X 50			0%
8	students know solar power technology with generation I, generation II and generation III solar cells	Students can explain solar power technology with generation I, generation II and generation III solar cells	**Criteria:** 60% correct answers	lectures, discussions and assignments 2 X 50			0%
9	UTS			2 X 50			0%
10	Students know the working principles and components of lighting systems using solar powered light	Students can explain the working principles and components of lighting systems using solar powered light	**Criteria:** attached	lectures, discussions and assignments 2 X 50			0%
11	Students can know the working principles and components of a solar water heating system	Students can explain the working principles and components of a solar water heating system	**Criteria:** attached	lectures, discussions and assignments 2 X 50			0%
12	Students can know the working principles and components of a solar powered stove	Students can explain the working principles and components of a solar powered stove system	**Criteria:** attached	lectures, discussions and assignments 2 X 50			0%
13	students know the various uses of solar energy technology for processing agricultural products	Students can explain the working principles and components of using solar energy for processing agricultural products	**Criteria:** attached	lectures, discussions, assignments 2 X 50			0%

14	students know the various uses of solar energy technology for processing agricultural products	Students can explain the working principles and components of using solar energy for processing agricultural products	**Criteria:** attached	lectures, discussions, assignments 2 X 50			0%
15	Students can learn about the use of new technology in solar power technology systems	Students can explain new technology in solar power technology systems	**Criteria:** attached	discussion and presentation 2 X 50			0%
16	UTS			2 X 50			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.