	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
Pneumatic and Hydraulic	2120102069		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	**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 an understanding of the basic principles of pneumatic and hydraulic systems, the function of various types of pneumatic and hydraulic system components, the design and simulation of pneumatic and hydraulic system circuits, and the practice of operating pneumatic trainers.
References	**Main :**

1. Parr, A. 2003. Hidrolika dan Pneumatik. Jakarta: Erlangga.
2. Tanpa Penulis. 2000. Buku Petunjuk Teknik Tenaga Fluida Pneumatik. The Hydro-Pneumatic Technical Centre.
3. Tanpa Penulis. 2000. Buku Petunjuk Teknik Tenaga Fluida Hidrolik Minyak. The Hydro-Pneumatic Technical Centre.

Supporters:	
Supporting lecturer	Agung Prijo Budijono, S.T., M.T. Ir. Wahyu Dwi Kurniawan, S.Pd., 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 principles of hydraulic systems	1. Define the basic principles of hydraulic systems 2. Identify the characteristics of hydraulic fluids. 3. Identify advantages of hydraulic systems. 4. Identify hydraulic system deficiencies	**Criteria:** Conformity (100%) with the answer key gets a score of 100	Scientific approach Method: lecture, discussion, question and answer, Direct Learning Model Strategy: exercises, simulations, and assignments 2 X 50			0%
2	Get to know the various components of the hydraulic system	Define various components of a hydraulic system Explain the function of various components of a hydraulic system	**Criteria:** Conformity (100%) with the answer key gets a score of 100	Scientific approach Method: lecture, discussion, question and answer, Direct Learning Model Strategy: exercises, simulations, and assignments 2 X 50			0%
3	Understand various hydraulic system applications	Identify various applications of hydraulic systems	**Criteria:** Compliance with the answer key gets a score of 100	Approach: Contextual based learning Method: Lecture, discussion, question and answer Model: Direct learning Strategy: Guided practice, simulation, and 2 X 50 assignments			0%
4	Understand various hydraulic system applications	Identify various applications of hydraulic systems	**Criteria:** Compliance with the answer key gets a score of 100	Approach: Contextual based learning Method: Lecture, discussion, question and answer Model: Direct learning Strategy: Guided practice, simulation, and 2 X 50 assignments			0%

5	Understand various hydraulic system applications	Identify various applications of hydraulic systems	**Criteria:** Compliance with the answer key gets a score of 100	Approach: Contextual based learning Method: Lecture, discussion, question and answer Model: Direct learning Strategy: Guided practice, simulation, and 2 X 50 assignments			0%
6	Understand various hydraulic system applications	Identify various applications of hydraulic systems	**Criteria:** Compliance with the answer key gets a score of 100	Approach: Contextual based learning Method: Lecture, discussion, question and answer Model: Direct learning Strategy: Guided practice, simulation, and 2 X 50 assignments			0%
7	Understand various hydraulic system applications	Identify various applications of hydraulic systems	**Criteria:** Compliance with the answer key gets a score of 100	Approach: Contextual based learning Method: Lecture, discussion, question and answer Model: Direct learning Strategy: Guided practice, simulation, and 2 X 50 assignments			0%
8	UTS	UTS	**Criteria:** Compliance with the answer key gets a score of 100	UTS 2 X 50			0%
9	Understand various hydraulic system applications	Identify various applications of hydraulic systems	**Criteria:** Compliance with the answer key gets a score of 100	Approach: Contextual based learning Method: Lecture, discussion, question and answer Model: Direct learning Strategy: Guided practice, simulation, and 2 X 50 assignments			0%

10	Understand various hydraulic system applications	Identify various applications of hydraulic systems	**Criteria:** Compliance with the answer key gets a score of 100	Approach: Contextual based learning Method: Lecture, discussion, question and answer Model: Direct learning Strategy: Guided practice, simulation, and 2 X 50 assignments			0%
11	Understand various hydraulic system applications	Identify various applications of hydraulic systems	**Criteria:** Compliance with the answer key gets a score of 100	Approach: Contextual based learning Method: Lecture, discussion, question and answer Model: Direct learning Strategy: Guided practice, simulation, and 2 X 50 assignments			0%
12	Understand various hydraulic system applications	Identify various applications of hydraulic systems	**Criteria:** Compliance with the answer key gets a score of 100	Approach: Contextual based learning Method: Lecture, discussion, question and answer Model: Direct learning Strategy: Guided practice, simulation, and 2 X 50 assignments			0%
13	Understand various hydraulic system applications	Identify various applications of hydraulic systems	**Criteria:** Compliance with the answer key gets a score of 100	Approach: Contextual based learning Method: Lecture, discussion, question and answer Model: Direct learning Strategy: Guided practice, simulation, and 2 X 50 assignments			0%

14	Understand various hydraulic system applications	Identify various applications of hydraulic systems	**Criteria:** Compliance with the answer key gets a score of 100	Approach: Contextual based learning Method: Lecture, discussion, question and answer Model: Direct learning Strategy: Guided practice, simulation, and 2 X 50 assignments			0%
15	Understand various hydraulic system applications	Identify various applications of hydraulic systems	**Criteria:** Compliance with the answer key gets a score of 100	Approach: Contextual based learning Method: Lecture, discussion, question and answer Model: Direct learning Strategy: Guided practice, simulation, and 2 X 50 assignments			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** 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.