SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Design Techniques	8320302172		T=2	P=0	ECTS=3.18	4	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	Agung Prijo Budijono, S.T., M.T. ; Dr. Djoko Suwito, M.Pd. ; Ali Hasbi Ramadani, S.Pd., M.Pd. ; Wahyu Dwi Kurniawan, S.Pd., M.Pd.	....	Ir. Wahyu Dwi Kurniawan, S.Pd., M.Pd.

Learning model	Case Studies

Program Learning Outcomes (PLO)	**PLO study program which is charged to the course**	
	PLO-5	Have social competence and personality competence in mechanical engineering education
	PLO-8	Able to carry out maintenance and repairs in the automotive engineering field (automotive concentration) or able to operate various production equipment and machines in the manufacturing sector (production concentration)
	Program Objectives (PO)	
	PO - 1	Students have good morals, ethics and personality when attending lectures
	PO - 2	Students have knowledge of work procedures for designing production machines
	PO - 3	Students have skills in the work of designing production machines
	PO - 4	Students are able to interact and work together in teams, be responsible, think logically and intelligently in solving problems faced professionally in designing production machines
	PLO-PO Matrix	

P.O	PLO-5	PLO-8
PO-1		
PO-2		
PO-3		
PO-4		

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
PO-1																
PO-2																
PO-3																
PO-4																

Short Course Description	Understanding various production processes and mechanisms, determining torque requirements, calculating engine rotation, calculating power requirements, selecting drive motors, gear boxes, pulleys, belts, chains as needed, designing transmission systems, designing machine component placement, calculating shaft diameters, determining bearing types and the bolt nuts, create a picture of the engine arrangement.						
References	**Main :**						
	1. Mott, Robert L., 2009. Elemen-Elemen Mesin dalam Perancangan Mekanis Edition 1st. Yogyakarta: ANDI. 2. Mott, Robert L., 2009. Elemen-Elemen Mesin dalam Perancangan Mekanis Edition 2nd. Yogyakarta: ANDI.						
	Supporters:						
Supporting lecturer	Dr. Djoko Suwito, M.Pd. Dr. Yunus, M.Pd. Agung Prijo Budijono, S.T., M.T. Ir. Wahyu Dwi Kurniawan, S.Pd., M.Pd. Ali Hasbi Ramadani, 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 various types of production processes and their mechanisms.	· Able to explain types of production processes · Able to explain the mechanisms of various production machine processes		Discussion, questions and answers, exercises and assignments 2 X 50			0%
2	Determine torque requirements for the production process	· Skilled in choosing the amount of torque on production machines		Discussion, questions and answers, exercises and assignments 2 X 50			0%
3	Calculate engine rotation according to capacity	· Determine the rotation on the appropriate machine		Discussion, questions and answers, exercises and assignments 2 X 50			0%
4	Calculate engine power requirements	· Determine the power on the machine		Discussion, questions and answers, exercises and assignments 2 X 50			0%
5	Choose the motor, gearbox, pulley, belt, chain according to your needs	· Skilled in selecting machine components according to needs		Discussion, questions and answers, exercises and assignments 2 X 50			0%
6	Designing transmission systems	· Skilled in designing transmission systems		Discussion, questions and answers, exercises and assignments 2 X 50			0%
7	understand material I to 6	master material I to 6		Written exam 2 X 50			0%

8	Design the placement of the main components.	· Skilled in determining the placement of the main machine components		Discussion, questions and answers, exercises and assignments 3 X 50			0%
9	Calculating torque moment	· Determine the torque moment on the component		Discussion, questions and answers, exercises and assignments 2 X 50			0%
10	Calculate the shaft diameter.	· Skilled in calculating component shaft diameters		Discussion, questions and answers, exercises and assignments 2 X 50			0%
11	Determine the type of bearing and bolt nuts.	· Skilled in choosing the type of bearing on the machine · Skilled in choosing nuts and bolts on components		Discussion, questions and answers, exercises and assignments 3 X 50			0%
12	Create an array image.	· Able to create machine layout drawings using software		Discussion, questions and answers, exercises and assignments 3 X 50			0%
13	Create an array image.	· Able to make a drawing of the arrangement of a machine	**Criteria:** Compliance with the answer key	Guided practice and 2 X 50 assignments			0%
14	Create an array image.	· Able to make a drawing of the arrangement of a machine	**Criteria:** Compliance with the answer key	Guided practice and 2 X 50 assignments			0%
15	Create an array image.	· Able to make a drawing of the arrangement of a machine	**Criteria:** Compliance with the answer key	Guided practice and 2 X 50 assignments			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** 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.