



Universitas Negeri Surabaya
Faculty of Engineering,
Mechanical Engineering Education Undergraduate Study Program

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Chassis Technology	8320302184	Compulsory Study Program Subjects	T=2	P=0	ECTS=3.18	3	July 17, 2024
AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator				
	Muamar Zainul Arif, S.Pd., M.Pd	Muamar Zainul Arif, S.Pd., M.Pd	Ir. Wahyu Dwi Kurniawan, S.Pd., M.Pd.				

Learning model	Case Studies
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Program Learning Outcomes (PLO)	PLO study program that is charged to the course																																																																																																																																										
	PLO-5	Have social competence and personality competence in mechanical engineering education																																																																																																																																									
	PLO-7	Have an understanding of technopreneurship in the field of automotive/production technology																																																																																																																																									
	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)																																																																																																																																									
	PLO-10	Have an understanding of mathematics and basic mechanical engineering																																																																																																																																									
	Program Objectives (PO)																																																																																																																																										
	PO - 1	Able to understand vehicle bodies, chassis types																																																																																																																																									
	PO - 2	Able to understand and explain the working principles of power transfer systems																																																																																																																																									
	PO - 3	Able to understand and explain the working principles and components of the brake system																																																																																																																																									
	PO - 4	Able to understand and explain the working principles of the steering system																																																																																																																																									
	PO - 5	Understand the concept of modern vehicle chassis technology including: intelligent braking concept, intelligent torque control concept, intelligent suspension concept, vehicle direction technology concept, and smart chassis																																																																																																																																									
	PLO-PO Matrix																																																																																																																																										
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Short Course Description	This course aims to develop knowledge about chassis technology, working principles of power transfer systems and vehicle control. The power transfer system includes: clutch mechanism, transmission system, propeller shaft and differential. Meanwhile, the control system includes: steering system, suspension system, brake system and wheels. Apart from that, this course also introduces the concept of modern vehicle chassis technology including: intelligent braking concept, intelligent torque control concept, intelligent suspension concept, vehicle direction technology concept, and smart chassis.
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References	<p>Main :</p> <ol style="list-style-type: none"> Anwir, B.S. 1980.Seri Pelajaran Teknologi Secara BergambarTeknik Mobil. Jakarta: Barata Karya Aksara.Toyota.1985.Dasar-Dasar Automobil. Jakarta:Astra Motor Service edition. Muamar Z Arif, 2020. Panduan Praktikum Chasis. PT. Toyota Astra Mobil. 1981. Pedoman Reparasi Chasis . Jakarta: PT.Toyota Astra Motor Nurhadi, 2020. TEKNOLOGI CHASSIS KENDARAAN MODERN. Andi Offset. Jogyakarta <p>Supporters:</p>
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Supporting lecturer		Muamar Zainul Arif, S.Pd., M.Pd. Bima Anggana Widhiarta Putra, 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 function and model of four-wheeled vehicle frames	Students can explain the types of vehicle frames and can determine the right type of frame for the vehicle	Criteria: Qualitative Form of Assessment : Participatory Activities	Direct learning 2 X 50		Material: Types of vehicle frames Reference: Anwir, BS 1980. <i>Illustrated Technology Lesson Series Car Engineering</i> . Jakarta: Barata Karya Aksara. Toyota.1985. <i>Automobile Basics</i> . Jakarta: Astra Motor Service edition.	5%
2	Understand the working principles of the clutch and know the mechanical clutch components	Students can explain the working principle of a clutch and know the components of a mechanical clutch	Criteria: Observation/observation Form of Assessment : Participatory Activities	Cooperative learning 2 X 50		Material: working principles of mechanical clutches, clutch components Library: PT. Toyota Astra Car. 1981. <i>Chassis Repair Guide</i> . Jakarta: PT. Toyota Astra Motor	5%
3	Understand the working principle of the clutch and know the components of the automatic clutch	Students can explain the working principle of a clutch and know the components of an automatic clutch	Criteria: Criteria: Quantitative Form of Assessment : Participatory Activities		Small group discussions 2 x 50	Material: working principles of automatic clutches Reference: Muamar Z Arif, 2020. <i>Chassis Practical Guide</i> .	5%
4	Understand the working principles of manual transmission	Students can explain the working principles of transmission and know the function of transmission components	Criteria: Quantitative Form of Assessment : Participatory Activities		Small Group Discussion 2 x 50	Material: working principles of manual transmission, function of transmission components Reader: PT. Toyota Astra Car. 1981. <i>Chassis Repair Guide</i> . Jakarta: PT. Toyota Astra Motor	5%
5	Understand the power flow of the transmission system	Able to explain and create power flow diagrams for transmission systems	Criteria: Quantitative Form of Assessment : Participatory Activities		Small Group Discussion 2 x 50	Material: Principles of transmission gear shifting, power flow of the transmission system Library: PT. Toyota Astra Car. 1981. <i>Chassis Repair Guide</i> . Jakarta: PT. Toyota Astra Motor	5%
6	Understand the working principles of automatic transmission	Students can explain the working principles of a CVT model automatic transmission	Criteria: Quantitative Form of Assessment : Participatory Activities		Problem Based Learning 2 x 50	Material: working principles of CVT model automatic transmission, function of CVT model automatic transmission components Library: PT. Toyota Astra Car. 1981. <i>Chassis Repair Guide</i> . Jakarta: PT. Toyota Astra Motor	5%
7	Understand the components of the propeller shaft and transaxel	Students can explain the function of the propeller and transaxel	Form of Assessment : Participatory Activities	Direct learning 2 X 50		Material: Working principle of the propeller shaft and transaxel and their working functions Reference: PT. Toyota Astra Car. 1981. <i>Chassis Repair Guide</i> . Jakarta: PT. Toyota Astra Motor	5%
8	UTS		Form of Assessment : Test	2 X 50		Material: Power transfer system Reference: PT. Toyota Astra Car. 1981. <i>Chassis Repair Guide</i> . Jakarta: PT. Toyota Astra Motor	10%
9	Students know and understand various types of tires and rims	Students are able to describe various types of tires and rims	Criteria: Quantitative Form of Assessment : Participatory Activities	Discovery learning 2 X 50		Material: Types and models of tires and rims Reference: PT. Toyota Astra Car. 1981. <i>Chassis Repair Guide</i> . Jakarta: PT. Toyota Astra Motor	5%
10	Students understand the working principles and components of hydraulic brakes	Able to analyze each vehicle's brake system and make reports regarding brake conditions, brake system analysis and brake system repairs	Criteria: Quantitative Form of Assessment : Project Results Assessment / Product Assessment	Project based learning 2 X 50		Material: Brake System Reference: Nurhadi, 2020. <i>MODERN VEHICLE CHASSIS TECHNOLOGY</i> . Andi Offset. Jakarta Material: hydraulic brake system Reference: Nurhadi, 2020. <i>MODERN VEHICLE CHASSIS TECHNOLOGY</i> . Andi Offset. Jakarta	10%

11	students understand the working principles and components of ABS and EBS brakes	Students are able to describe the working principles and components of ABS and EBS brakes	Criteria: Qualitative Form of Assessment : Participatory Activities	Small Group discussions 2 x 50		Material: ABS BRAKE system Reference: Nurhadi, 2020. <i>MODERN VEHICLE CHASSIS TECHNOLOGY. Andi Offset. Jakarta</i>	2%
12	students understand the working principles and components of ABS and EBS brakes	1. Students are able to describe the working principles and components of ABS and EBS brakes 2. Qualitative	Form of Assessment : Participatory Activities	Small Group discussions 2 x 50		Material: ABS BRAKE system Reference: Nurhadi, 2020. <i>MODERN VEHICLE CHASSIS TECHNOLOGY. Andi Offset. Jakarta</i> Material: working principles of ABS brakes Reference: Nurhadi, 2020. <i>MODERN VEHICLE CHASSIS TECHNOLOGY. Andi Offset. Jakarta</i>	3%
13	Students can understand how the suspension works and components	Students explain how the suspension works and components	Criteria: Quantitative Form of Assessment : Participatory Activities		Contextual learning 2 x 50	Material: suspension working principles Reference: Nurhadi, 2020. <i>MODERN VEHICLE CHASSIS TECHNOLOGY. Andi Offset. Jakarta</i>	5%
14	Students can understand the working principles and components of steering and power steering systems	Students can describe the working principles and components of steering and power steering systems	Criteria: Quantitative Form of Assessment : Participatory Activities	Discovery learning 2 X 50		Material: working principles and components of steering and power steering systems Reference: Nurhadi, 2020. <i>MODERN VEHICLE CHASSIS TECHNOLOGY. Andi Offset. Jakarta</i>	5%
15	Know the sizes and SOPs regarding wheel geometry adjustments	Students can explain sizes and SOPs regarding wheel geometry adjustments	Criteria: Quantitative Form of Assessment : Participatory Activities	Direct learning 2 X 50		Material: Wheel geometry Reference: Nurhadi, 2020. <i>MODERN VEHICLE CHASSIS TECHNOLOGY. Andi Offset. Jakarta</i>	5%
16	UAS		Form of Assessment : Test	2 X 50		Material: Brake system, suspension system, steering system, wheel geometry Reference: Nurhadi, 2020. <i>MODERN VEHICLE CHASSIS TECHNOLOGY. Andi Offset. Jakarta</i>	20%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	60%
2.	Project Results Assessment / Product Assessment	10%
3.	Test	30%
		100%

Notes

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Forms of assessment:** test and non-test.
- 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.
- 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.
- Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
- 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%.
- TM=Face to face, PT=Structured assignments, BM=Independent study.

