

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

Document Code

SEMESTER LEARNING PLAN

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Courses		CODE	CODE		•	Course Family		Credit Wei		ight		SEM	ESTER	2	Con Date	npilation e		
Practicum on Phenomena	Basic Machine	2120102074	Ļ							T=2	P=0	ECTS	6=3.18		5 July 16, 2024			16, 2024
AUTHORIZAT	ION	SP Develop	er							se Cl dinat			Study Program Coordinator					
	Diastian Vin Priyo Heru A Herlamba S	Dr. Mohammad Effendy, S.T., M.T. Diastian Vinaya Wijanarko, S.T., M.T. Priyo Heru Adiwibowo, S.T., M.T. Indra Herlamba Siregar, S.T., M.T. Dany Iman Santoso, S.T., M.T.						Priyo Heru Adiwibowo, S.T., M.T.				Ir. Priyo Heru Adiwibowo, S.T., M.T.						
Learning model	Case Studies							·						•				
Program	PLO study pr	ogram that is cha	rged	l to th	ne co	ourse	•											
Learning Outcomes	PLO-5	Work independently and in groups																
(PLO)	PLO-12	Introduction of modern equipment																
	PLO-14	Science and engineering knowledge																
	Program Obj	ectives (PO)																
	PO - 1	Able to change real world situations into models that suit related courses																
	PO - 2	Ability to establish appropriate criteria for solutions in the evaluation process.																
	PO - 3	Able to analyze alternative solutions to engineering problems																
	PO - 4	Able to apply selected techniques, skills and tools of modern engineering practices to given situations																
	PO - 5	Able to deliver presentations orally.																
	PO - 6	Able to explain the impact of engineering decisions in a global, economic, environmental and social context.																
	PLO-PO Matr	trix																
			- I							٦								
		P.0	PLO-5			PLO-1		LO-1:	2		PLO-	14	_					
		PO-1											_					
		PO-2											_					
		PO-3											_					
		PO-4																
		PO-5											_					
		PO-6																
	DO Matrix at	t the end of each learning stage (Sub-PO)																
	PO Matrix at	the end of each le	arnii	ng sta	age (Sub∙	·PO)											
		P.0	Week															
		1.0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		PO-1	Т	2	5	7	5	0	'	0	5	10	11	12	15	14	15	10
		PO-1 PO-2																
		PO-3																
		PO-4																
		PO-5																
		PO-6																

Short Course Descript	tion	moments and the flow meter app	ransverse forces, ro aratus; Exhaust ga cal revolution; Com	chine Phenomena is a the d deflection, torque, powe s analyzer, smoke opacim parative flow measurement	r, fuel cons eter; Sound	umption, exhaust emission d level meter; Simple vib	ons, noise levels; Dyna ration apparatus, dyna	mometer, fuel mic balancing
Referen	ces	Main :						
		2011.ln 2002.F dan ke 2. Warju. 3. Fox, Ro	eknologiReduksi E ntroduction to Fluid undamentals of He pustakaan lain 2010.TeknologiRed obert W. 2011.Introo pera, Frank & Dewi	Performa Mesin Kenc misi Gas Buang Kenda Mechanics,8th edition. Ne at and MassTransfer, Fifth luksi Emisi Gas Buang Ker duction to Fluid Mechanics tt P. David. 2002.Fundame	uraan Berr ew York:Jo edition. Ne ndaraan Be ,8th edition	notor. Surabaya: Unesa hn Wiley & Sons, Inc.P.I w York: John Willey and rmotor. Surabaya: Unesa . New York:John Wiley &	nclopera, Frank & De Sons, Inc.Bahan-baha UniversityPress. Sons, Inc.	witt P. David. n dari Internet
		Supporters:						
Support lecturer	ting	Ir. Priyo Heru A Dr. Warju, S.Pd Diastian Vinaya Ika Nurjannah,	ı Wijanarko, S.T., M	-				
Week-	eac	al abilities of h learning	Ev	valuation	Le Stud	Help Learning, arning methods, dent Assignments, Estimated time]	Learning materials	Assessment Weight (%)
stag		b-PO)	Indicator	ndicator Criteria & Form		Online (online)	[References]	
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	tor of	n measure the rque and power a motor hicle	1.Can measure the torque of a motor vehicle 2.Can measure the power of a motorized vehicle	Criteria: According to the scoring guidelines and presentation rubric, full marks are obtained if you follow and do all the practicums well and correctly Form of Assessment : Participatory Activities	Practical 2 X 50		Material: measuring the torque and power of a motor vehicle Reference: Warju. 2009. Motor Vehicle Engine Performance Testing. Surabaya: Unesa University Press. Warju. 2010. Technology for Reducing Motor Vehicle Exhaust Gas Emissions. Surabaya: Unesa UniversityPress. Fox, Robert W. 2011. Introduction to Fluid Mechanics, 8th edition. New York:John Wiley & Sons, Inc. P. Inclopera, Frank & Dewitt P. David. 2002.Fundamentals of Heat and Mass Transfer, Fifth	5%

2	Can measure the torque and power of a motor vehicle	Able to use a chassis dynamometer to measure torque and power of motorized vehicles	Criteria: According to the scoring guidelines and presentation rubric, full marks are obtained if you follow and do all the practicums well and correctly Form of Assessment : Participatory Activities, Practice/Performance	Practical 2 X 50	Material: using a chassis dynamometer to measure torque and power of motorized vehicles. Reference: Warju. 2009. Motor Vehicle Engine Performance Testing. Surabaya: Unesa University Press. Warju. 2010. Technology for Reducing Motor Vehicle Exhaust Gas Emissions. Surabaya: Unesa UniversityPress. Fox, Robert W. 2011. Introduction to Fluid Mechanics, 8th edition. New York:John Wiley & Sons, Inc. P. Inclopera, Frank & Dewitt P. David. 2002.Fundamentals of Heat and Mass Transfer, Fifth edition. New York: John Willey and Sons, Inc. Materials from the Internet and other literature	5%
3	Calculate fuel consumption	Able to calculate fuel consumption	Criteria: According to the scoring guidelines and presentation rubric, full marks are obtained if you follow and do all the practicums well and correctly Form of Assessment : Participatory Activities, Practice/Performance	Practical 2 X 50	Material: calculating fuel consumption Reference: Warju. 2009. Motor Vehicle Engine Performance Testing. Surabaya: Unesa University Press. Warju. 2010. Technology for Reducing Motor Vehicle Exhaust Gas Emissions. Surabaya: Unesa UniversityPress. Fox, Robert W. 2011. Introduction to Fluid Mechanics, 8th edition. New York:John Wiley & Sons, Inc. P. Inclopera, Frank & Dewitt P. David. 2002.Fundamentals of Heat and Mass Transfer, Fifth edition. New York: John Willey and Sons, Inc. Materials from the Internet and other literature	5%

4	Can test fuel consumption	Able to test fuel consumption using a measuring cup and stopwatch	Criteria: According to the scoring guidelines and presentation rubric, full marks are obtained if you follow and do all the practicums well and correctly Form of Assessment : Participatory Activities, Practice/Performance	Practical 2 X 50	Material: Testing fuel consumptionReference: Warju.2009. Motor VehicleEnginePerformanceTesting. Surabaya:Unesa UniversityPress. Warju. 2010.Technology forReducing MotorVehicle ExhaustGas Emissions.Surabaya: UnesaUniversityPress.Fox, Robert W.2011. Introductionto Fluid Mechanics,8th edition. NewYork:John Wiley &Sons, Inc. P.Inclopera, Frank &Dewitt P. David.2002.Fundamentalsof Heat andMassTransfer, Fifthedition. New York:John Willey andSons, Inc. Materialsfrom the Internetand other literature	5%
5	Can measure motor vehicle emissions	Can measure motor vehicle emissions using a gas analyzer	Criteria: According to the scoring guidelines and presentation rubric, full marks are obtained if you follow and do all the practicums well and correctly Form of Assessment : Participatory Activities, Practice/Performance	Practical 2 X 50	Material: motor vehicle emissions Reference : Warju. 2010. Technology for Reducing Motor Vehicle Exhaust Gas Emissions. Surabaya: Unesa UniversityPress.	5%
6	Analyzing motor vehicle emissions	Able to analyze motor vehicle emissions	Criteria: According to the scoring guidelines and presentation rubric, full marks are obtained if you follow and do all the practicums well and correctly Form of Assessment : Participatory Activities, Practice/Performance	Practical 2 X 50	Material: Analyzing motor vehicle emissions Reference: Warju. 2010. Technology for Reducing Motor Vehicle Exhaust Gas Emissions. Surabaya: Unesa UniversityPress.	5%
7	Can measure vehicle noise	Able to measure vehicle noise with a sound level meter	Criteria: According to the scoring guidelines and presentation rubric, full marks are obtained if you follow and do all the practicums well and correctly Form of Assessment : Participatory Activities, Practice/Performance	Practical 2 X 50	Material: Analyzing motor vehicle emissions Reference: Warju. 2010. Technology for Reducing Motor Vehicle Exhaust Gas Emissions. Surabaya: Unesa UniversityPress. Material: Able to measure vehicle noise Reference: Warju. 2010. Technology for Reducing Motor Vehicle Exhaust Gas Emissions. Surabaya: Unesa UniversityPress.	5%

8	Able to analyze vehicle noise	Able to analyze vehicle noise	Criteria: According to the scoring guidelines and presentation rubric, full marks are obtained if you follow and do all the practicums well and correctly Form of Assessment : Participatory Activities, Practice/Performance	Practical 2 X 50	Material: Analyzing motor vehicle emissions Reference: Warju. 2010. Technology for Reducing Motor Vehicle Exhaust Gas Emissions. Surabaya: Unesa UniversityPress. Material: Analyzing vehicle noise Reference: Warju. 2010. Technology for Reducing Motor Vehicle Exhaust Gas Emissions. Surabaya: Unesa UniversityPress.	10%
9	Measuring and Calculating Turbine Input Capacity	 Measuring Turbine Input Capacity parameters with a v notch weir (Water) or velocitymeter (Wind) Calculating Turbine Input Capacity 	scoring guidelines and presentation rubric, full marks are obtained if you follow and do all the practicums well and correctly Form of Assessment : Participatory Activities	Practical 2 X 50	Material: Turbine Input Capacity References: Fox, Robert W. 2011.Introduction to Fluid Mechanics, 8th edition. New York: John Wiley & Sons, Inc.	5%
10	Calculating Input Power	Able to calculate Input Power	Criteria: According to the scoring guidelines and presentation rubric, full marks are obtained if you follow and do all the practicums well and correctly Form of Assessment : Participatory Activities	Practical 2 X 50	Material: Turbine Input Capacity References: Fox, Robert W. 2011.Introduction to Fluid Mechanics, 8th edition. New York: John Wiley & Sons, Inc. Material: Input Power References: Fox, Robert W. 2011.Introduction to Fluid Mechanics, 8th edition. New York: John Wiley & Sons, Inc.	5%
11	Measuring and calculating Turbine Torque	 Measuring Turbine Torque using a prony break Calculating Turbine Torque 	Criteria: According to the scoring guidelines and presentation rubric, full marks are obtained if you follow and do all the practicums well and correctly Form of Assessment : Participatory Activities, Practice/Performance	Practical 2 X 50	Material: Turbine Input Capacity References: Fox, Robert W. 2011. Introduction to Fluid Mechanics, 8th edition. New York: John Wiley & Sons, Inc. Material: Input Power References: Fox, Robert W. 2011. Introduction to Fluid Mechanics, 8th edition. New York: John Wiley & Sons, Inc. Material: Turbine Torque Reference: Fox, Robert W. 2011. Introduction to Fluid Mechanics, 8th edition. New York: John Wiley & Sons, Inc.	5%

12	Measuring and calculating Turbine Power	1.Measure revolutions using a tachometer 2.Calculating Turbine Power from Torque and Turbine rotation results	Criteria: According to the scoring guidelines and presentation rubric, full marks are obtained if you follow and do all the practicums well and correctly Form of Assessment : Practice / Performance	Practical 2 X 50	Material: Turbine Power References: Fox, Robert W. 2011.Introduction to Fluid Mechanics, 8th edition. New York: John Wiley & Sons, Inc.	5%
13	Analyzing Turbine Power	Able to analyze Turbine Power	Criteria: According to the scoring guidelines and presentation rubric, full marks are obtained if you follow and do all the practicums well and correctly Form of Assessment : Participatory Activities, Practice/Performance	Practical 2 X 50	Material: Turbine Power References: Fox, Robert W. 2011.Introduction to Fluid Mechanics, 8th edition. New York: John Wiley & Sons, Inc.	10%
14	Calculating Turbine Efficiency	Able to Calculate Turbine Efficiency	Criteria: According to the scoring guidelines and presentation rubric, full marks are obtained if you follow and do all the practicums well and correctly Form of Assessment : Participatory Activities, Practice/Performance	Practical 2 X 50	Material: Turbine Efficiency References: Fox, Robert W. 2011.Introduction to Fluid Mechanics, 8th edition. New York: John Wiley & Sons, Inc.	5%
15	Analyzing Turbine Efficiency	Able to analyze turbine efficiency	Criteria: According to the scoring guidelines and presentation rubric, full marks are obtained if you follow and do all the practicums well and correctly Form of Assessment : Participatory Activities, Practice/Performance	Practical 2 X 50	Material: Turbine Efficiency References: Fox, Robert W. 2011.Introduction to Fluid Mechanics, 8th edition. New York: John Wiley & Sons, Inc.	10%
16	Presentation and discussion of Practicum results	1.Able to present Practicum results 2.Able to discuss Practicum results	Criteria: According to the scoring guidelines and presentation rubric, full marks are obtained if you follow and do all the practicums well and correctly Form of Assessment : Participatory Activities, Practice/Performance	Practical 2 X 50	Material: Final assessment References: Fox, Robert W. 2011. Introduction to Fluid Mechanics, 8th edition. New York: John Wiley & Sons, Inc.	10%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage	
1.	Participatory Activities	55%	
2.	Practice / Performance	45%	
		100%	

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.
- 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.
- 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,
- Learning, Metricale Jonation Programming, 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.
- 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.