



**Universitas Negeri Surabaya
Vocational Faculty,
D4 Civil Engineering Study Program**

Document
Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight	SEMESTER	Compilation Date		
CONSTRUCTION EQUIPMENT	2230502028		T=2 P=0 ECTS=3.18	4	July 17, 2024		
AUTHORIZATION	SP Developer		Course Cluster Coordinator	Study Program Coordinator			
	Puguh Novi Prasetyono, S.Pd.,M.T/ Drs. Hasan Dani, M.T		Drs. Hasan Dani, M.T.	Puguh Novi Prasetyono, S.Pd., M.T.			
Learning model	Case Studies						
Program Learning Outcomes (PLO)	PLO study program that is charged to the course						
	PLO-11	Able to apply knowledge of mathematics, natural and/or materials science, civil engineering information technology to gain a thorough understanding of the principles and methods of civil engineering in the field of building construction.					
	Program Objectives (PO)						
	PLO-PO Matrix						
		P.O	PLO-11				
Short Course Description	This course provides an understanding of the function and production of: field cleaning equipment, digging and lifting equipment, loader and transport equipment, compaction equipment, dredging equipment, stone crushing equipment, concreting and asphaltting equipment, Car Crane equipment, Tower Crane equipment, Pile Driving equipment Equipment, Compressors, Water Pumps, Generators, Hand Power Tools, as well as calculations of costs for using Construction Equipment. Learning is carried out by applying lecture, discussion, presentation and assignment methods.						
	References	Main : 1. Rochmanhadi.1992. Alat-alat berat dan penggunaannya. Jakarta: Yayasan Badan Penerbit Pekerjaan Umum. 2. Susy Fatena Rostiyanti. 2008. Alat Berat untuk Konstruksi. Jakarta: Rineka Cipta. 3. Asianto. 2008. Manajemen Alat Berat untuk konstruksi. Jakarta: Pradnya Paramita. 4. Anonimus. 2008. Caterpillar Performance. Handbook, Perioria Illionis USA: Caterpillar.Inc Supporters:					
Supporting lecturer	Drs. Hasan Dani, M.T. Puguh Novi Prasetyono, S.Pd., M.T.						
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	Able to explain land transfer strategies	Students can: a. Explain matters related to the basics of land transfer. b. Explain the nature and types of soil. c. Calculating tool efficiency. d. Calculating tool productivity.	Criteria: Can answer correctly and precisely Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and presentations 2 X 50	Lectures, discussions, questions and answers, and presentations 2 X 50	Material: land transfer strategy Reference: <i>Susy Fatena Rostiyanti. 2008. Heavy Equipment for Construction. Jakarta: Rineka Cipta.</i>	0%
2	Able to explain the purpose, types and classification of heavy equipment	a. Explain the purpose of using heavy equipment on construction projects. b. Explain the classification of heavy equipment. c. Explain the factors that influence the selection of heavy equipment. d. Explain heavy equipment in various construction projects	Criteria: Can answer correctly and precisely Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and presentations 2 X 50	Lectures, discussions, questions and answers, and presentations 2 X 50	Material: purpose, types and classification of heavy equipment Reader: <i>Susy Fatena Rostiyanti. 2008. Heavy Equipment for Construction. Jakarta: Rineka Cipta.</i>	0%
3	Able to explain the types and purposes of field cleaning equipment, as well as calculate the productivity of the equipment.	a. Explain the various types of field cleaning equipment. b. Explain the parts and functions of field cleaning equipment. c. Calculate the productivity of field cleaning equipment.	Criteria: Can answer correctly and precisely Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and presentations 2 X 50	Lectures, discussions, questions and answers, and presentations 2 X 50	Material: types and purposes of field cleaning equipment, as well as calculating equipment productivity. Reader: <i>Susy Fatena Rostiyanti. 2008. Heavy Equipment for Construction. Jakarta: Rineka Cipta.</i>	5%
4	Able to explain the types and purposes of land clearing equipment, and able to calculate the productivity of this equipment.	a. Explain the definition of land clearing work. b. Explain the factors that influence land clearing activities and productivity. c. Calculating land clearing productivity.	Criteria: Can answer correctly and precisely Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and presentations 2 X 50	Lectures, discussions, questions and answers, and presentations 2 X 50	Material: types and purposes of land clearing equipment, as well as being able to calculate equipment productivity Library: <i>Asianto. 2008. Heavy Equipment Management for construction. Jakarta: Pradnya Paramita.</i>	0%
5	Able to explain the types, functions and how digging and lifting equipment works, as well as being able to calculate the productivity of this equipment.	a. Explain the various types of digging and lifting equipment. b. Explain the function of digging and lifting equipment. c. Explain how digging and lifting equipment works. d. Calculate the productivity of digging and lifting equipment.	Criteria: Can answer correctly Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and presentations 2 X 50	Lectures, discussions, questions and answers, and presentations 2 X 50	Material: types, functions and how digging and lifting equipment works, as well as being able to calculate equipment productivity Library: <i>Asianto. 2008. Heavy Equipment Management for construction. Jakarta: Pradnya Paramita.</i>	0%

6	Able to explain the types, functions and workings of loading and transport equipment, as well as being able to calculate the productivity of this equipment.	a. Explain the various types of loading and transport equipment. a. Explain the function of loading and transport equipment. b. Explain how loader and transport equipment works. c. Calculate the productivity of loader and transport equipment.	Criteria: Can answer correctly and precisely Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and presentations 2 X 50	Lectures, discussions, questions and answers, and presentations 2 X 50	Material: types, functions and how loading and transporting equipment works, as well as being able to calculate equipment productivity. Reader: Susy Fatena Rostiyanti. 2008. <i>Heavy Equipment for Construction</i> . Jakarta: Rineka Cipta.	0%
7	Able to explain the types, functions, parts and workings of surface forming and compaction equipment, and able to calculate the productivity of this equipment.	a. Explain the types of surface forming and compaction equipment. b. Explain the parts and functions of surface forming and compaction equipment. c. Explain how surface forming and compaction equipment works. d. Calculate the productivity of surface forming and compaction equipment	Criteria: Can answer correctly and precisely Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and presentations 2 X 50	Lectures, discussions, questions and answers, and presentations 2 X 50	Material: types, functions, parts and workings of surface forming and compaction equipment, as well as being able to calculate equipment productivity. Library: Susy Fatena Rostiyanti. 2008. <i>Heavy Equipment for Construction</i> . Jakarta: Rineka Cipta.	5%
8	-USS Exam	-100 marks if answered correctly	Criteria: -100 marks if answered correctly Form of Assessment : Participatory Activities	-2 X 50 Written Exam	Written Exam 2 X 50	Material: construction equipment Reader: Susy Fatena Rostiyanti. 2008. <i>Heavy Equipment for Construction</i> . Jakarta: Rineka Cipta. Material: construction equipment Reference: Asianto. 2008. <i>Heavy Equipment Management for construction</i> . Jakarta: Pradhya Paramita.	20%
9	Able to explain the purpose, types and how dredging equipment works, as well as being able to calculate the productivity of the equipment.	a. Explain the purpose of dredging work. b. Explain the various types of dredging equipment. c. Calculating the productivity of dredging equipment.	Criteria: Can answer correctly and precisely Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and presentations 2 X 50	Lectures, discussions, questions and answers, and presentations 2 X 50		5%

10	Able to explain the function, capacity and how stone crushing equipment works	a. Explain the function of stone crushing equipment, b. Explain the capacity of stone crushing equipment, c. Calculating the productivity of stone crushing equipment,	Criteria: Can answer correctly and precisely Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and presentations 2 X 50	Lectures, discussions, questions and answers, and presentations 2 X 50	Material: function, capacity and how stone crushing equipment works Library: Susy Fatena Rostiyanti. 2008. <i>Heavy Equipment for Construction</i> . Jakarta: Rineka Cipta.	0%
11	Able to explain the functions, types and workings of concrete and paving equipment, and able to calculate the productivity of this equipment.	a. Explain the function of concrete and paving equipment. b. Explain the various types of paving and paving equipment. c. Calculate the productivity of concrete and paving equipment	Criteria: Can answer correctly and precisely Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and presentations 2 X 50	Lectures, discussions, questions and answers, and presentations 2 X 50	Material: functions, types and how concrete and asphalt equipment works, as well as being able to calculate the productivity of this equipment. Bibliography: Susy Fatena Rostiyanti. 2008. <i>Heavy Equipment for Construction</i> . Jakarta: Rineka Cipta.	5%
12	Able to explain the functions, parts and workings of mobile cranes, tower cranes, pile driving equipment, and be able to calculate the productivity of this equipment.	a. Explain the function of mobile cranes, tower cranes, pile driving equipment. b. Explain the parts of a mobile crane, tower crane, pile driving equipment. c. Explain how mobile cranes, tower cranes, pile driving equipment work. d. Calculating the productivity of mobile cranes, tower cranes, pile driving equipment.	Criteria: Can answer correctly and precisely Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and presentations 2 X 50	Lectures, discussions, questions and answers, and presentations 2 X 50	Material: functions, parts and how mobile cranes, tower cranes, pile driving equipment work, as well as being able to calculate the productivity of this equipment. Bibliography: Susy Fatena Rostiyanti. 2008. <i>Heavy Equipment for Construction</i> . Jakarta: Rineka Cipta. Material: functions, parts and how mobile cranes, tower cranes, pile driving equipment work, as well as being able to calculate the productivity of this equipment. Reference: Asianto. 2008. <i>Heavy Equipment Management for construction</i> . Jakarta: Pradhya Paramita.	5%

13	Able to explain the function and workings of compressors, water pumps and generators, as well as being able to calculate the productivity of this equipment.	a. Explain the function of compressors, water pumps and generators. b. Explain how compressors, water pumps and generators work. c. Calculate the productivity of compressors, water pumps and generators.	Criteria: Can answer correctly and precisely Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, and presentations 2 X 50	Lectures, discussions, questions and answers, and presentations 2 X 50	Material: function and working of compressors, water pumps and generators, as well as being able to calculate the productivity of this equipment. Bibliography: <i>Susy Fatena Rostiyanti. 2008. Heavy Equipment for Construction. Jakarta: Rineka Cipta.</i>	0%
14	Able to explain the types, functions and how hand power tools work, as well as being able to calculate the productivity of the equipment.	a. Explain the various types of hand power tools. b. Explain the function of hand power tools. c. Explain how hand power tools work. d. Calculating the productivity of hand power tools.	Criteria: Can explain correctly and precisely	Lectures, discussions, questions and answers, and presentations 2 X 50	Lectures, discussions, questions and answers, and presentations 2 X 50	Material: types, functions and how hand power tools work, as well as being able to calculate the productivity of the equipment. Bibliography: <i>Susy Fatena Rostiyanti. 2008. Heavy Equipment for Construction. Jakarta: Rineka Cipta.</i>	5%
15	Able to calculate the cost of construction equipment	a. Explain the various sources of procurement of construction equipment b. Explain the cost structure of construction equipment c. Explain the classification of construction equipment financing d. Explain the various unit prices for work/construction equipment rental. Calculate the unit price of work/construction equipment rental	Criteria: Can answer correctly and precisely	Lectures, discussions, questions and answers, and presentations 2 X 50	Lectures, discussions, questions and answers, and presentations 2 X 50	Material: calculating the cost of construction equipment Reader: <i>Susy Fatena Rostiyanti. 2008. Heavy Equipment for Construction. Jakarta: Rineka Cipta.</i>	5%
16	Summative Exam	100 marks if answered correctly	Criteria: 100 marks if answered correctly	written exam 2 X50	written exam 2 X50	Material: construction equipment Reader: <i>Susy Fatena Rostiyanti. 2008. Heavy Equipment for Construction. Jakarta: Rineka Cipta.</i> Material: construction equipment Reference: <i>Asianto. 2008. Heavy Equipment Management for construction. Jakarta: Pradnya Paramita.</i>	20%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	45%
		45%

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.