	Universitas Negeri Surabaya Faculty of Engineering, Building Engineering Education Undergraduate Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
MPK-WORK TOOLS	8320502316	Compulsory Study Program Subjects	T=2	P=0	ECTS=3.18	6	July 18, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
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Learning model	**Project Based Learning**

Program Learning Outcomes (PLO)

PLO study program that is charged to the course

Program Objectives (PO)

PO - 1	Students have the ability to plan calculations and use them in the Construction Equipment course by utilizing learning resources and ICT (ASPECTS OF WORK FIELD CAPABILITY).
PO - 2	Students have knowledge of the theory of Construction Equipment courses from planning and calculating the efficiency of using construction equipment. (ASPECT OF KNOWLEDGE CAPABILITY).
PO - 3	Students have the ability to choose the right construction equipment according to job characteristics (WORK AND MANAGERIAL CAPABILITY ASPECTS).
PO - 4	Students have a responsible attitude in developing construction equipment courses in accordance with applicable regulations (WORK FIELD CAPABILITY ASPECTS).

PLO-PO Matrix

P.O
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

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 asphalting 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. Caterpilar Performance. Handbook, Perioria Illionis USA: Caterpillar.Inc

Supporters:

Supporting lecturer	Drs. Andang Widjaja, S.T., M.T. Hendra Wahyu Cahyaka, S.T., M.T. Heri Suryaman, 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	Able to explain land transfer strategies	Capabilities related to earth moving strategies	**Criteria:** Carrying out good and correct industrial practices **Form of Assessment** : Participatory Activities, Practice/Performance	case studies and work practices 2 x 50	case studies and work practices 2 x 50	**Material:** land transfer strategy **Reference:** *Rochmanhadi.1992. Heavy equipment and their use. Jakarta: Public Works Publishing Agency Foundation.*	0%
2	Able to explain the purpose, types and classification of heavy equipment	Knowledge and application skills for various types and classifications of heavy equipment	**Criteria:** Carrying out good and correct industrial practices **Form of Assessment** : Participatory Activities, Practice/Performance	case studies and work practices 2 x 50	case studies and work practices 2 x 50	**Material:** good and correct industrial practices **Reader:** *Susy Fatena Rostiyanti. 2008. Heavy Equipment for Construction. Jakarta: Rineka Cipta.*	0%
3	Able to explain the types and purposes of field cleaning equipment, as well as calculate the productivity of the equipment.	1. Explain the various types of field cleaning equipment. 2. Explain the parts and functions of field cleaning equipment. 3. Calculate the productivity of field cleaning equipment.	**Form of Assessment** : Participatory Activities	case studies and work practices 2 x 50	case studies and work practices 2 x 50	**Material:** field cleaning equipment. **Reference:** *Asianto. 2008. Heavy Equipment Management for construction. Jakarta: Pradnya Paramita.*	0%
4	Able to explain the types and purposes of land clearing equipment, and able to calculate the productivity of this equipment.	1. Explain the definition of land clearing work. 2. Explain the factors that influence land clearing activities and productivity. 3. Calculating land clearing productivity.	**Form of Assessment** : Participatory Activities	case studies and work practices 2 x 50	case studies and work practices 2 x 50	**Material:** land clearing work **Reference:** *Anonymous. 2008. Caterpillar Performance. Handbook, Perioria Illinois USA: Caterpillar.Inc* **Material:** factors that influence land clearing activities and productivity. **Bibliography:** *Rochmanhadi.1992. Heavy equipment and their use. Jakarta: Public Works Publishing Agency Foundation.* **Material:** land clearing productivity. **Bibliography:** *Susy Fatena Rostiyanti. 2008. Heavy Equipment for Construction. Jakarta: Rineka Cipta.*	10%

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.	1. Explain the various types of digging and lifting equipment. 2. Explain the function of digging and lifting equipment. 3. Explain how digging and lifting equipment works. 4. Calculate the productivity of digging and lifting equipment.	**Criteria:** digging and lifting equipment. **Form of Assessment** : Participatory Activities	case studies and work practices 2 x 50	case studies and work practices 2 x 50	**Material:** various digging and lifting equipment. **Bibliography:** *Rochmanhadi.1992. Heavy equipment and their use. Jakarta: Public Works Publishing Agency Foundation.*	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.	1. Explain the various types of loading and transport equipment. 2. Explain the function of loading and transport equipment. 3. Explain how loader and transport equipment works. 4. Calculate the productivity of loader and transport equipment.	**Form of Assessment** : Participatory Activities, Practice/Performance	case studies and work practices 2 x 50	case studies and work practices 2 x 50		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.	1. Explain the types of surface forming and compaction equipment. 2. Explain the parts and functions of surface forming and compaction equipment. 3. Explain how surface forming and compaction equipment works.	**Form of Assessment** : Participatory Activities	case studies and work practices 2 x 50	case studies and work practices 2 x 50		0%
8	UTS		**Form of Assessment** : Participatory Activities, Practice/Performance	case studies and work practices 2 x 50	case studies and work practices 2 x 50		30%
9	Able to explain the purpose, types and how dredging equipment works, as well as being able to calculate the productivity of the equipment.	1. Explain the purpose of dredging work. 2. Explain the various types of dredging equipment. 3. Calculating the productivity of dredging equipment.	**Forms of Assessment** : Participatory Activities, Portfolio Assessment, Practice / Performance	case studies and work practices 2 x 50	case studies and work practices 2 x 50		0%
10	Able to explain the purpose, types and how dredging equipment works, as well as being able to calculate the productivity of the equipment.	1. Explain the function of stone crushing equipment 2. Explain the capacity of stone crushing equipment 3. Calculating the productivity of stone crushing equipment	**Forms of Assessment** : Participatory Activities, Portfolio Assessment, Practice / Performance	case studies and work practices 2 x 50	case studies and work practices 2 x 50		0%

11	Able to explain the functions, types and workings of concrete and paving equipment, and able to calculate the productivity of this equipment.	1. Explain the function of concrete and paving equipment. 2. Explain the various types of paving and paving equipment. 3. Calculate the productivity of concrete and paving equipment	**Forms of Assessment** : Participatory Activities, Portfolio Assessment, Practice / Performance	case studies and work practices 2 x 50	case studies and work practices 2 x 50		0%
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.	1. Explain the function of mobile cranes, tower cranes, pile driving equipment. 2. Explain the parts of a mobile crane, tower crane, pile driving equipment. 3. Explain how mobile cranes, tower cranes, pile driving equipment work. 4. Calculating the productivity of mobile cranes, tower cranes, pile driving equipment.	**Forms of Assessment** : Participatory Activities, Portfolio Assessment, Practice / Performance	case studies and work practices 2 x 50	case studies and work practices 2 x 50		0%
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.	1. Explain the function of compressors, water pumps and generators. 2. Explain how compressors, water pumps and generators work. 3. Calculate the productivity of compressors, water pumps and generators.	**Forms of Assessment** : Participatory Activities, Portfolio Assessment, Practice / Performance	case studies and work practices 2 x 50	case studies and work practices 2 x 50		20%
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.	1. Explain the various types of hand power tools. 2. Explain the function of hand power tools. 3. Explain how hand power tools work. 4. Calculating the productivity of hand power tools.	**Forms of Assessment** : Participatory Activities, Portfolio Assessment, Practice / Performance	case studies and work practices 2 x 50	case studies and work practices 2 x 50		0%

15	Able to calculate the cost of construction equipment	1. Explain the various sources of procurement of construction equipment 2. Explain the cost structure of construction equipment 3. Explain the classification of construction equipment financing 4. Explain the various unit prices for construction work/equipment rental. Calculate the unit price of work/construction equipment rental	**Forms of Assessment** : Participatory Activities, Portfolio Assessment, Practice / Performance	case studies and work practices 2 x 50	case studies and work practices 2 x 50		0%
16	UAS		**Forms of Assessment** : Participatory Activities, Portfolio Assessment, Practice / Performance, Tests	case studies and work practices 2 x 50	case studies and work practices 2 x 50		40%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	41.67%
2.	Portfolio Assessment	16.67%
3.	Practice / Performance	31.67%
4.	Test	10%
		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.
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.