



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
Work Plane	8320302126	Compulsory Study Program Subjects	T=2	P=0	ECTS=3.18	4	May 2, 2023
AUTHORIZATION	SP Developer		Course Cluster Coordinator			Study Program Coordinator	
	Ika Nurjannah, S.Pd., M.T.		Ika Nurjannah, S.Pd., M.T.			Ir. Wahyu Dwi Kurniawan, S.Pd., M.Pd.	

Learning model	Case Studies
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Program Learning Outcomes (PLO)	PLO study program which is charged to the course											
	PLO-10	Have an understanding of mathematics and basic mechanical engineering										
	Program Objectives (PO)											
	PO - 1	Students are able to understand Material Handling equipment										
	PO - 2	Students are able to understand and analyze components and theories of lifting equipment										
	PO - 3	Students are able to understand and analyze transport equipment										
	PO - 4	Students are able to understand and analyze surface and overhead equipment										
	PLO-PO Matrix											
		<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>P.O</th> <th>PLO-10</th> </tr> <tr> <td>PO-1</td> <td></td> </tr> <tr> <td>PO-2</td> <td></td> </tr> <tr> <td>PO-3</td> <td></td> </tr> <tr> <td>PO-4</td> <td></td> </tr> </table>	P.O	PLO-10	PO-1		PO-2		PO-3		PO-4	
	P.O	PLO-10										
PO-1												
PO-2												
PO-3												
PO-4												

PO Matrix at the end of each learning stage (Sub-PO)																																																																																																						
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th rowspan="2">P.O</th> <th colspan="16">Week</th> </tr> <tr> <th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th><th>11</th><th>12</th><th>13</th><th>14</th><th>15</th><th>16</th> </tr> <tr> <td>PO-1</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>PO-2</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>PO-3</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>PO-4</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>	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																
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Short Course Description	This course is an introduction and understanding of types of material lifting and transporting equipment, characteristics of basic calculations, main component calculations, methods of selecting equipment types, types of surface and overhead equipment, capacity and production calculations.
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References	Main :
	<ol style="list-style-type: none"> [1] Rudenko, Material Handling Equipment. Moscow. Piece Publisher. [2] Sri Hartati. Pesawat Pengangkat. Surabaya. Unipress IKIP Surabaya.
	Supporters:
	<ol style="list-style-type: none"> [3] Ach. Muhib Zainuri. Mesin Pemindah Bahan. Jogjakarta: penerbit Andi [4] Rohmanhadi. Alat-alat Berat. Jakarta: badan pekerjaan umum.

Supporting lecturer		Ika Nurjannah, S.Pd., M.T. 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	Students are able to understand the material on transportation facilities in locations and transport aircraft	Students can explain the understanding of transportation facilities at locations and transport aircraft	Criteria: 1.Compliance with the answer key 2.Full marks if all answers are appropriate and correct 3.The mark is not full if there is an answer to the question that is not correct, and the mark is based on the score per point on the question Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, exercises and assignments 2 X 50		Material: Material handling equipment, transportation tools References: [3] Ach. Muhib Zainuri. <i>Material Moving Machine.</i> Jogjakarta: publisher Andi	3%
2	1.Students are able to understand and communicate the types of material moving machines 2.Students are able to understand lifting equipment	1.Students can explain about lifting equipment 2.Types of Material Moving Machines	Criteria: 1.Compliance with the answer key 2.Full marks if all answers are appropriate and correct 3.The mark is not full if there is an answer to the question that is not correct, and the mark is based on the score per point on the question Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, exercises and assignments 2 X 50		Material: Types of Material Moving Machines Library: [1] Rudenko, <i>Material Handling Equipment.</i> Moscow. Piece Publishers. Material: Types of material moving machines, lifting machines References: [3] Ach. Muhib Zainuri. <i>Material Moving Machine.</i> Jogjakarta: publisher Andi	5%

3	Students are able to understand, communicate and analyze components and theories of lifting equipment	Students can explain the components and theory of lifting equipment	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Compliance with the answer key 2.Full marks if all answers are appropriate and correct 3.The mark is not full if there is an answer to the question that is not correct, and the mark is based on the score per point on the question <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions, questions and answers, exercises and assignments 2 X 50		<p>Material: components and theory of lifting equipment References: [1] Rudenko, <i>Material Handling Equipment.</i> Moscow. Piece Publishers.</p> <p>Material: components and theory of lifting equipment References: [3] Ach. Muhib Zainuri. <i>Material Moving Machine.</i> Jogjakarta: publisher Andi</p>	7%
4	Students are able to understand, communicate and analyze components and theories of lifting equipment	<ol style="list-style-type: none"> 1.Students can explain the components and theory of lifting equipment 2.Flexible lifting equipment (chains and ropes) 	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Compliance with the answer key 2.Full marks if all answers are appropriate and correct 3.The mark is not full if there is an answer to the question that is not correct, and the mark is based on the score per point on the question <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions, questions and answers, exercises and assignments 2 X 50		<p>Material: Flexible lifting equipment (chains and ropes) References: [1] Rudenko, <i>Material Handling Equipment.</i> Moscow. Piece Publishers.</p> <p>Material: Flexible lifting equipment (chains and ropes) References: [3] Ach. Muhib Zainuri. <i>Material Moving Machine.</i> Jogjakarta: publisher Andi</p>	5%
5	Students are able to understand, communicate and analyze components and theories of lifting equipment	<ol style="list-style-type: none"> 1.Students can explain the components and theory of lifting equipment 2.Flexible lifting equipment (chains and ropes) 3.steel wire rope 	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Compliance with the answer key 2.Full marks if all answers are appropriate and correct 3.The mark is not full if there is an answer to the question that is not correct, and the mark is based on the score per point on the question <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions, questions and answers, exercises and assignments 2 X 50		<p>Material: steel wire, roller chain, welded chain. Reference: [1] Rudenko, <i>Material Handling Equipment.</i> Moscow. Piece Publishers.</p>	5%

6	Students are able to understand pulleys, pulley systems, sprockets and drums	Students can explain and analyze pulleys, pulley systems, sprockets and drums	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Full marks if all answers are appropriate and correct 2.The mark is not full if there is an answer to the question that is not correct, and the mark is based on the score per point on the question <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions, questions and answers, exercises and assignments 2 X 50		<p>Material: Pulleys, Pulley Systems, sprockets and drums References: [1] Rudenko, Material Handling Equipment. Moscow. Piece Publishers.</p>	5%
7	Students are able to understand and analyze transfer mechanics	Students can explain and analyze transfer mechanics	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Full marks if all answers are appropriate and correct 2.The mark is not full if there is an answer to the question that is not correct, and the mark is based on the score per point on the question <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions, questions and answers, exercises and assignments 2 X 50		<p>Material: transfer mechanics References: [3] Ach. Muhib Zainuri. Material Moving Machine. Jogjakarta: publisher Andi</p> <hr/> <p>Material: transfer mechanics References: [4] Rohmanhadi. Heavy equipments. Jakarta: public works agency.</p>	5%
8	UTS	UTS	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Compliance with the answer key 2.Full marks if all answers are appropriate and correct 3.The mark is not full if there is an answer to the question that is not correct, and the mark is based on the score per point on the question <p>Form of Assessment : Test</p>	written test 2 X 50		<p>Material: Material handling equipment, transportation equipment Reference: [1] Rudenko, Material Handling Equipment. Moscow. Piece Publishers.</p> <hr/> <p>Material: lifting machines, transporters and overhead equipment Reference: [3] Ach. Muhib Zainuri. Material Moving Machine. Jogjakarta: publisher Andi</p> <hr/> <p>Material: heavy equipment Reference: [4] Rohmanhadi. Heavy equipments. Jakarta: public works agency.</p>	20%

9	Students are able to understand and analyze additional load handling equipment	Students can explain additional equipment for handling loads	Criteria: <ol style="list-style-type: none"> 1. Compliance with the answer key 2. Full marks if all answers are appropriate and correct 3. The mark is not full if there is an answer to the question that is not correct, and the mark is based on the score per point on the question 	Lectures, discussions, questions and answers, exercises and assignments 2 X 50		Material: Additional Load Handling Equipment Literature: <i>[1] Rudenko, Material Handling Equipment. Moscow. Piece Publishers.</i> <hr/> Material: Additional Tools for Load Handling Literature: <i>[3] Ach. Muhib Zainuri. Material Moving Machine. Jogjakarta: publisher Andi</i>	5%
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10	Students are able to understand and analyze additional load handling equipment	Students can explain additional equipment for handling loads	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Compliance with the answer key 2.Full marks if all answers are appropriate and correct 3.The mark is not full if there is an answer to the question that is not correct, and the mark is based on the score per point on the question 	Lectures, discussions, questions and answers, exercises and assignments 2 X 50		<p>Material: Additional Tools for Load Handling Literature: [3] Ach. Muhib Zainuri. <i>Material Moving Machine.</i> Jogjakarta: publisher Andi</p>	5%
11	Students are able to understand retaining and brake equipment	Students can explain about retaining and brake equipment	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Compliance with the answer key 2.Full marks if all answers are appropriate and correct 3.The mark is not full if there is an answer to the question that is not correct, and the mark is based on the score per point on the question <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions, questions and answers, exercises and assignments 2 X 50		<p>Material: restraining and brake equipment Reference: [3] Ach. Muhib Zainuri. <i>Material Moving Machine.</i> Jogjakarta: publisher Andi</p>	5%
12	Students are able to understand the actuation of lifting equipment	Students are able to understand the actuation of lifting equipment	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Compliance with the answer key 2.Full marks if all answers are appropriate and correct 3.The mark is not full if there is an answer to the question that is not correct, and the mark is based on the score per point on the question <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions, questions and answers, exercises and assignments 2 X 50		<p>Material: lifting equipment drivers References: [1] Rudenko, <i>Material Handling Equipment.</i> Moscow. Piece Publishers.</p>	3%
13	Students are able to understand transport equipment	<ol style="list-style-type: none"> 1.Students can explain about transport equipment 2.type of conveyor 	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Compliance with the answer key 2.Full marks if all answers are appropriate and correct 3.The mark is not full if there is an answer to the question that is not correct, and the mark is based on the score per point on the question <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions, questions and answers, exercises and assignments 2 X 50		<p>Material: transportation equipment References: [3] Ach. Muhib Zainuri. <i>Material Moving Machine.</i> Jogjakarta: publisher Andi</p> <hr/> <p>Material: types of transport equipment, conveyors References: [1] Rudenko, <i>Material Handling Equipment.</i> Moscow. Piece Publishers.</p>	2%

14	Students are able to understand surface and overhead equipment	1.Students can explain surface and overhead equipment 2.types of surface equipment, heavy equipment	Criteria: 1.Compliance with the answer key 2.Full marks if all answers are appropriate and correct 3.The mark is not full if there is an answer to the question that is not correct, and the mark is based on the score per point on the question Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, exercises and assignments 2 X 50		Material: surface and overhead equipment Reference: [3] Ach. Muhib Zainuri. <i>Material Moving Machine.</i> Jogjakarta: publisher Andi	2%
15	Students are able to understand and analyze surface and overhead equipment	1.Students can explain about analyzing surface and overhead equipment 2.type of surface tool	Criteria: 1.Compliance with the answer key 2.Full marks if all answers are appropriate and correct 3.The mark is not full if there is an answer to the question that is not correct, and the mark is based on the score per point on the question Form of Assessment : Participatory Activities	Lectures, discussions, questions and answers, exercises and assignments 2 X 50		Material: surface and overhead equipment References: [1] Rudenko, <i>Material Handling Equipment.</i> Moscow. Piece Publishers. Material: types of heavy equipment References: [3] Ach. Muhib Zainuri. <i>Material Moving Machine.</i> Jogjakarta: publisher Andi	3%
16	UAS	UAS	Criteria: 1.Full marks are obtained if you do all the questions correctly 2.The mark is not full if there is an answer to the question that is not correct, and the mark is based on the score per point on the question Form of Assessment : Test	WRITTEN QUESTIONS 2 X 50		Material: heavy equipment References: [1] Rudenko, <i>Material Handling Equipment.</i> Moscow. Piece Publishers.	30%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	50%
2.	Test	50%
		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** 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.