



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

**Document
Code**

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Welding Design	2120102146		T=2	P=0	ECTS=3.18	5	April 5, 2023
AUTHORIZATION	SP Developer		Course Cluster Coordinator			Study Program Coordinator	
	Novi Sukma Drastiawati		Novi Sukma Drastiawati			Ir. Priyo Heru Adiwibowo, S.T., M.T.	

Learning model	Case Studies
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Program Learning Outcomes (PLO)	PLO study program that is charged to the course							
	Program Objectives (PO)							
	PO - 1	Welding design knowledge						
	PO - 2	Experimentation and data analysis						
	PO - 3	Problem analysis						
	PO - 4	Communication						
	PO - 5	Project and cost management						
	PLO-PO Matrix							
		<table border="1" style="margin: auto;"> <tr><td>P.O</td></tr> <tr><td>PO-1</td></tr> <tr><td>PO-2</td></tr> <tr><td>PO-3</td></tr> <tr><td>PO-4</td></tr> <tr><td>PO-5</td></tr> </table>	P.O	PO-1	PO-2	PO-3	PO-4	PO-5
	P.O							
PO-1								
PO-2								
PO-3								
PO-4								
PO-5								

PO Matrix at the end of each learning stage (Sub-PO)

		Week															
	P.O	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	PO-1																
	PO-2																
	PO-3																
	PO-4																
	PO-5																

Short Course Description	This course covers the Definition of Welding / Welding Techniques, Types of welding, Types of welding joints and welding positions, Welding heat transfer, Group projects, Welding symbols including identifying of weld drawing, Fillet welding (identifying of fillet welding), Butt welding (identifying of butt welding), stress in welds in general, seam welds, stress distribution in seam welds, and individual projects
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References	<p>Main :</p> <ol style="list-style-type: none"> 1. American Welding Society. 1994. The Everyday Pocket Handbook for Arc Welding Steel. United States of America : AWS Presidential Task Group. 2. Kou, Sindo. 2003. Welding Metallurgy. New Jersey : John Wiley and Sons. <p>Supporters:</p>
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1. 3. Budiharjo, A.H. ; Drastiawati Novi . 2014. Job Sheet Las Listrik SMAW. Surabaya : UNESA.
2. 4. Groover, Mikell P. 2012 . Introduction to Manufacturing Process. New Jersey : John Wiley an Sons.
3. 5. Ilman, Noer. 2011. Diktat Teknologi Las. Yogyakarta :Universitas Gadjah Mada.
4. 6. Okumura Toshie, Wiryosumarno Harsono. 2000. Teknologi Pengelasan Logam. Jakarta : Pradnya Paramita.
5. 7. Prasetyawanto, Lukas Oka. 2012. Ringkasan Materi Sub Bidang Pengelasan SMAW. Serang : Dikdas Teknologi Mekanik Balai Besar Latihan Kerja Industri
6. 8. Drastiawati, Novi Sukma dan Zakiyya, Hanna. 2018. Proses Manufaktur II (Teknik Pengelasan). Surabaya: Universitas Negeri Surabaya.

Supporting lecturer Novi Sukma Drastiawati, S.T., M.Eng.

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	Science and engineering knowledge: Sub CO/CPMK 1 Describe the classification of welding techniques	<ol style="list-style-type: none"> 1.Able to describe the definition of welding techniques 2.Able to describe the history of welding 3.Able to describe the development of welding technology 	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Report assessment criteria: 2.a. Compliance with reporting format 3.b. Results of analysis of the articles read 4.b. Conclusions and suggestions are prepared 5.Essay test criteria: Compliance with the answer key 6.Participation assessment: Attendance and activeness in lectures 7.Score criteria: Special: 90 to 100; Very good: 76 to 89; Average: 56 to 75; Below average: 0 to 55 <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions, questions and answers, and assignments 2 X 50		<p>Material: Definition of welding techniques, history of welding, and development of welding technology</p> <p>References: 8. <i>Drastiawati, Novi Sukma and Zakiyya, Hanna. 2018. Manufacturing Process II (Welding Techniques). Surabaya: Surabaya State University.</i></p>	3%
2	Science and engineering knowledge: Sub CO/CPMK 1 Describe welding classifications	<ol style="list-style-type: none"> 1.able to describe various types of welding 2.Able to describe the work processes of various types of welding 	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Report assessment criteria: 2.a. Compliance with reporting format 3.b. Results of analysis of the articles read 4.b. Conclusions and suggestions are prepared 5.Essay test criteria: Compliance with the answer key 6.Participation assessment: Attendance and activeness in lectures 7.Score criteria: Special: 90 to 100; Very good: 76 to 89; Average: 56 to 75; Below average: 0 to 55 <p>Form of Assessment : Participatory Activities</p>	Lectures, discussions, questions and answers, and assignments 2 X 50		<p>Material: Various types of welding</p> <p>Reference: 8. <i>Drastiawati, Novi Sukma and Zakiyya, Hanna. 2018. Manufacturing Process II (Welding Techniques). Surabaya: Surabaya State University.</i></p>	3%

3	Science and engineering knowledge: Sub CO/CPMK 1 Describe the types of welded joints and welding positions	<ol style="list-style-type: none"> 1. Be able to describe the types of welded joints 2. Able to describe welded joints 3. Able to analyze welded joints in the field of mechanical design 4. Able to describe the welding position 5. Able to describe the welding position 6. Able to choose the right welding position according to the design and AWS standards 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. a. Structured tasks 2. - Conformity with reporting format 3. - Results of analysis of the articles read 4. - Conclusions and suggestions are prepared 5. Participation 6. - Presence 7. - Active in question and answer, 8. - Seriousness in attending lectures 9. Score criteria: Special: 90 to 100; Very good: 76 to 89; Average: 56 to 75; Below average: 0 to 55 <p>Form of Assessment : Test</p>	- Lectures, discussions, questions and answers, and 2 X 50 Quiz assignments		<p>Material: Types of welding joints and welding positions</p> <p>References: 1. <i>American Welding Society. 1994. The Everyday Pocket Handbook for Arc Welding Steel. United States of America : AWS Presidential Task Group.</i></p>	5%
4	Science and engineering knowledge: Sub CO/CPMK 1 Describe the types of welded joints and welding positions	<ol style="list-style-type: none"> 1. Be able to describe the types of welded joints 2. Able to describe welded joints 3. Able to analyze welded joints in the field of mechanical design 4. Able to describe the welding position 5. Able to describe the welding position 6. Able to choose the right welding position according to the design and AWS standards 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. a. Structured tasks 2. - Conformity with reporting format 3. - Results of analysis of the articles read 4. - Conclusions and suggestions are prepared 5. Participation 6. - Presence 7. - Active in question and answer, 8. - Seriousness in attending lectures 9. Score criteria: Special: 90 to 100; Very good: 76 to 89; Average: 56 to 75; Below average: 0 to 55 <p>Form of Assessment : Portfolio Assessment, Test</p>	- Lectures, discussions, questions and answers, and 2 X 50 Quiz assignments		<p>Material: Types of welding joints and welding positions</p> <p>References: 1. <i>American Welding Society. 1994. The Everyday Pocket Handbook for Arc Welding Steel. United States of America : AWS Presidential Task Group.</i></p>	5%

5	<p>Science and engineering knowledge: Sub CO/CPMK 1 Describe the types of welded joints and welding positions</p>	<ol style="list-style-type: none"> 1. Be able to describe the types of welded joints 2. Able to describe welded joints 3. Able to analyze welded joints in the field of mechanical design 4. Able to describe the welding position 5. Able to describe the welding position 6. Able to choose the right welding position according to the design and AWS standards 	<p>Criteria:</p> <ol style="list-style-type: none"> 1.a. Structured tasks 2.- Conformity with reporting format 3.- Results of analysis of the articles read 4.- Conclusions and suggestions are prepared 5. Participation 6.- Presence 7.- Active in question and answer, 8.- Seriousness in attending lectures <p>Score criteria: Special: 90 to 100; Very good: 76 to 89; Average: 56 to 75; Below average: 0 to 55</p> <p>Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Tests</p>	<p>- Lectures, discussions, questions and answers, and 2 X 50 Quiz assignments</p>	<p>Material: Types of welding joints and welding positions References: 1. <i>American Welding Society. 1994. The Everyday Pocket Handbook for Arc Welding Steel. United States of America : AWS Presidential Task Group.</i></p>	<p>4%</p>
6	<ol style="list-style-type: none"> 1. Science and Engineering Knowledge Sub CPMK 1.c. Able to demonstrate the correct use of specific facts about calculations in welding design (Heat Input and Welding Heat Transfer) and techniques to obtain performance behavior given certain inputs in welding design (PWHT and Pre-Heat Process for welding design). 2. Experiment and data analysis Sub CPMK 3.a. Able to formulate problems (identify needs) and analyze constraints regarding welding design 	<ol style="list-style-type: none"> 1. Able to calculate welding heat transfer 2. Able to formulate problems regarding heat input in welding 3. Able to analyze welding heat transfer on the surface of the workpiece 4. Able to find the appropriate heat treatment in the welding process 	<p>Criteria:</p> <ol style="list-style-type: none"> 1. Task results: Compliance with reporting format 2. Results of analysis of the articles read 3. Conclusions and suggestions are prepared 4. Essay writing test: Compliance with the answer key 5. Participation : 6. Presence 7. Activeness in questions and answers, seriousness in attending lectures <p>Score criteria: Special: 90 to 100; Very good: 76 to 89; Average: 56 to 75; Below average: 0 to 55</p> <p>Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Tests</p>	<p>Lectures, discussions, questions and answers, and assignments Analysis of 2 X 50 calculation data</p>	<p>Material: Welding heat transfer, heat input, PWHT, and cooling processes in weld metal References: 5. <i>Ilman, Noer. 2011. Diktat on Welding Technology. Yogyakarta: Gadjah Mada University.</i></p>	<p>1%</p>

7	<p>1.Science and Engineering Knowledge: 1.c. Able to demonstrate the appropriate use of specific facts of mathematics, science regarding welding heat transfer calculations and heat input in weld design and techniques to obtain performance behavior in weld design (PWHT and Pre-Heat Process)</p> <p>2.Experiments and data analysis: 3.a. Able to formulate problems (identify needs) and analyze constraints on welding design</p>	<p>1.Able to calculate welding heat transfer</p> <p>2.Able to formulate problems regarding heat input in welding</p> <p>3.Able to analyze welding heat transfer on the surface of the workpiece</p> <p>4.Able to find the appropriate heat treatment in the welding process</p>	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Task results: Compliance with reporting format 2.Results of analysis of the articles read 3.Conclusions and suggestions are prepared 4.Essay writing test: Compliance with the answer key 5.Participation : 6.Presence 7.Activeness in questions and answers, seriousness in attending lectures 8.Score criteria: Special: 90 to 100; Very good: 76 to 89; Average: 56 to 75; Below average: 0 to 55 <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	<p>Lectures, discussions, questions and answers, and assignments Analysis of 2 X 50 calculation data</p>	<p>Material: Welding heat transfer, heat input, PWHT, and cooling processes in weld metal</p> <p>References: 5. Ilman, Noer. 2011. <i>Diktat on Welding Technology.</i> Yogyakarta: Gadjah Mada University.</p>	1%
8	SUB SUMATIVE EXAMINATION	SUB SUMATIVE EXAMINATION	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Format compatibility 2.Conformity of the contents of the report with the tasks carried out 3.Conclusion of the report results 4.Compliance with the answer key 5.Presence 6.Activeness in questions and answers, seriousness in attending lectures 7.Score criteria: Special: 90 to 100; Very good: 76 to 89; Average: 56 to 75; Below average: 0 to 55 	WRITTEN TEST 2 X 50	<p>Material: SUB SUMATIVE TEST</p> <p>References: 5. Ilman, Noer. 2011. <i>Diktat on Welding Technology.</i> Yogyakarta: Gadjah Mada University.</p>	20%

9	<p>1.Problem analysis: Sub CPMK4.a. Able to formulate problems and identify problems in case studies of welding design and weld failure</p> <p>2.Problem analysis: Sub CPMK 4.b. Ability to recognize several solutions required in welding design</p> <p>3.Problem analysis: Sub CPMK. 4.c. Able to analyze alternative solutions to welding design problems</p> <p>4.Problem analysis: Sub CPMK 4.d. Able to provide solutions to problems in welding design</p>	<p>1.Able to formulate problems in welding design</p> <p>2.Able to make simple welding designs</p> <p>3.Able to find solutions in welding design</p> <p>4.Able to recognize weld defects</p>	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Format compatibility 2.Match the contents of the report with the tasks carried out 3.Conclusion of the report results 4.Appropriateness of the group presentation theme 5.Presence 6.Activeness in questions and answers, seriousness in attending lectures 7.Score criteria: Special: 90 to 100; Very good: 76 to 89; Average: 56 to 75; Below average: 0 to 55 <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	Lectures, discussions, questions and answers, and 2 X 50 group project assignments	<p>Material: Group project presentation on welding design for machining components.</p> <p>References:</p> <p>1. <i>American Welding Society. 1994. The Everyday Pocket Handbook for Arc Welding Steel. United States of America : AWS Presidential Task Group.</i></p>	2%
10	<p>1.Science and engineering knowledge: Sub CO/CPMK 1</p> <p>1.a. Ability to identify specific facts regarding welding stress calculations</p> <p>2.Science and engineering knowledge: Sub CO/CPMK1.c. Able to demonstrate the proper use of welding stress specific facts and the use of welded joints based on welding stress</p>	<p>1.Able to describe stress in welding</p> <p>2.Able to calculate stress in welding</p> <p>3.Able to analyze the results of welding voltage calculations for use in selecting the type of welding</p>	<p>Criteria:</p> <p>Score criteria: Special: 90 to 100; Very good: 76 to 89; Average: 56 to 75; Below average: 0 to 55</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Lecture, discussion and question and answer quiz 2 x 50 minutes	<p>Material: Various welding stresses and welding stress calculations</p> <p>References:</p> <p>2. <i>Kou, Sindo. 2003. Welding Metallurgy. New Jersey : John Wiley and Sons.</i></p>	2%

11	<p>1.Science and Engineering Knowledge: 1.c. Able to demonstrate appropriate use of specific facts of mathematics, science, and engineering to elicit performance behavior given specific input.</p> <p>2.Problem analysis: 4.a. Able to formulate problems and identify main problems / variables</p>	<p>1.Able to describe welding symbols including identifying of weld drawing, Fillet welding (identifying of fillet welding), and Butt welding (identifying of butt welding)</p> <p>2.Able to describe welding symbols including identifying of weld drawing, Fillet welding (identifying of fillet welding), and Butt welding (identifying of butt welding)</p> <p>3.Able to analyze welding symbols including identifying of weld drawing, Fillet welding (identifying of fillet welding), and Butt welding (identifying of butt welding)</p> <p>4.Able to apply welding symbols including identifying of weld drawing, Fillet welding (identifying of fillet welding), and Butt welding (identifying of butt welding) in welding design</p>	<p>Criteria: Score criteria: Special: 90 to 100; Very good: 76 to 89; Average: 56 to 75; Below average: 0 to 55</p> <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	Lectures, discussions, assignments 2 x 50 minutes		<p>Material: Welding symbols including identifying of weld drawing Fillet welding (identifying of fillet welding) Butt welding (identifying of butt welding)</p> <p>References: 1. American Welding Society. 1994. <i>The Everyday Pocket Handbook for Arc Welding Steel</i>. United States of America : AWS Presidential Task Group.</p> <hr/> <p>Material: Welding symbols including identifying of weld drawing Fillet welding (identifying of fillet welding) Butt welding (identifying of butt welding)</p> <p>References: 5. Ilman, Noer. 2011. <i>Diktat on Welding Technology</i>. Yogyakarta: Gadjah Mada University.</p> <hr/> <p>Material: Welding symbols including identifying of weld drawing Fillet welding (identifying of fillet welding) Butt welding (identifying of butt welding)</p> <p>References: 6. Okumura Toshie, Wiryosumarno Harsono. 2000. <i>Metal Welding Technology</i>. Jakarta : Pradnya Paramita.</p>	4%
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12	<p>1.Science and Engineering Knowledge: 1.c. Able to demonstrate appropriate use of specific facts of mathematics, science, and engineering to elicit performance behavior given specific input.</p> <p>2.Problem analysis: 4.a. Able to formulate problems and identify main problems / variables</p>	<p>1.Able to describe welding symbols including identifying of weld drawing, Fillet welding (identifying of fillet welding), and Butt welding (identifying of butt welding)</p> <p>2.Able to describe welding symbols including identifying of weld drawing, Fillet welding (identifying of fillet welding), and Butt welding (identifying of butt welding)</p> <p>3.Able to analyze welding symbols including identifying of weld drawing, Fillet welding (identifying of fillet welding), and Butt welding (identifying of butt welding)</p> <p>4.Able to apply welding symbols including identifying of weld drawing, Fillet welding (identifying of fillet welding), and Butt welding (identifying of butt welding) in welding design</p>	<p>Criteria: Score criteria: Special: 90 to 100; Very good: 76 to 89; Average: 56 to 75; Below average: 0 to 55</p> <p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	Lectures, discussions, assignments 2 x 50 minutes		<p>Material: Welding symbols including identifying of weld drawing Fillet welding (identifying of fillet welding) Butt welding (identifying of butt welding)</p> <p>References: 1. American Welding Society. 1994. <i>The Everyday Pocket Handbook for Arc Welding Steel. United States of America : AWS Presidential Task Group.</i></p> <hr/> <p>Material: Welding symbols including identifying of weld drawing Fillet welding (identifying of fillet welding) Butt welding (identifying of butt welding)</p> <p>References: 5. Ilman, Noer. 2011. <i>Diktat on Welding Technology. Yogyakarta: Gadjah Mada University.</i></p> <hr/> <p>Material: Welding symbols including identifying of weld drawing Fillet welding (identifying of fillet welding) Butt welding (identifying of butt welding)</p> <p>References: 6. Okumura Toshie, Wiryosumarno Harsono. 2000. <i>Metal Welding Technology. Jakarta : Pradnya Paramita.</i></p>	3%
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13	<p>1. Communication: 6.b. Able to present content in your own words to demonstrate understanding of concepts 6.d. Able to use language well and correctly. 6.e. Able to deliver presentations orally</p> <p>2. Project and cost management: 7.a. Able to plan projects related to Industrial Problems in the field of Mechanical Engineering</p>	<p>1. Able to design welded joints 2. Able to determine the estimated cost of welded joints 3. Able to analyze projects that have been created 4. Able to make written reports from the results of projects that have been created 5. Able to present projects that have been made well</p>	<p>Form of Assessment : Project Results Assessment / Product Assessment</p>	<p>Project Guidance, Monitoring and evaluation of individual projects 2 x 50 minutes</p>	<p>Material: Individual project References: 1. <i>American Welding Society. 1994. The Everyday Pocket Handbook for Arc Welding Steel. United States of America : AWS Presidential Task Group.</i></p> <p>Material: Individual project References: 5. <i>Ilman, Noer. 2011. Diktat on Welding Technology. Yogyakarta: Gadjah Mada University.</i></p> <p>Material: Individual project Bibliography: 8. <i>Drastiawati, Novi Sukma and Zakiyya, Hanna. 2018. Manufacturing Process II (Welding Techniques). Surabaya: Surabaya State University.</i></p> <p>Material: Individual project Bibliography: 6. <i>Okumura Toshie, Wiryo Sumarno Harsono. 2000. Metal Welding Technology. Jakarta : Pradnya Paramita.</i></p>	2%
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14	<p>1. Communication: 6.b. Able to present content in your own words to demonstrate understanding of concepts 6.d. Able to use language well and correctly. 6.e. Able to deliver presentations orally</p> <p>2. Project and cost management: 7.a. Able to plan projects related to Industrial Problems in the field of Mechanical Engineering</p>	<p>1. Able to design welded joints 2. Able to determine the estimated cost of welded joints 3. Able to analyze projects that have been created 4. Able to make written reports from the results of projects that have been created 5. Able to present projects that have been made well</p>	<p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	<p>Project Guidance, Monitoring and evaluation of individual projects 2 x 50 minutes</p>		<p>Material: Individual project References: 1. <i>American Welding Society. 1994. The Everyday Pocket Handbook for Arc Welding Steel. United States of America : AWS Presidential Task Group.</i></p> <p>Material: Individual project References: 5. <i>Ilman, Noer. 2011. Diktat on Welding Technology. Yogyakarta: Gadjah Mada University.</i></p> <p>Material: Individual project Bibliography: 8. <i>Drastiawati, Novi Sukma and Zakiyya, Hanna. 2018. Manufacturing Process II (Welding Techniques). Surabaya: Surabaya State University.</i></p> <p>Material: Individual project Bibliography: 6. <i>Okumura Toshie, Wiryo Sumarno Harsono. 2000. Metal Welding Technology. Jakarta : Pradnya Paramita.</i></p>	15%
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15	<p>1. Communication: 6.b. Able to present content in your own words to demonstrate understanding of concepts 6.d. Able to use language well and correctly. 6.e. Able to deliver presentations orally</p> <p>2. Project and cost management: 7.a. Able to plan projects related to Industrial Problems in the field of Mechanical Engineering</p>	<p>1. Able to design welded joints 2. Able to determine the estimated cost of welded joints 3. Able to analyze projects that have been created 4. Able to make written reports from the results of projects that have been created 5. Able to present projects that have been made well</p>	<p>Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment</p>	<p>Project Guidance, Monitoring and evaluation of individual projects 2 x 50 minutes</p>	<p>Material: Individual project References: 1. <i>American Welding Society. 1994. The Everyday Pocket Handbook for Arc Welding Steel. United States of America : AWS Presidential Task Group.</i></p> <p>Material: Individual project References: 5. <i>Ilman, Noer. 2011. Diktat on Welding Technology. Yogyakarta: Gadjah Mada University.</i></p> <p>Material: Individual project Bibliography: 8. <i>Drastiawati, Novi Sukma and Zakiyya, Hanna. 2018. Manufacturing Process II (Welding Techniques). Surabaya: Surabaya State University.</i></p> <p>Material: Individual project Bibliography: 6. <i>Okumura Toshie, Wiryosumarno Harsono. 2000. Metal Welding Technology. Jakarta : Pradnya Paramita.</i></p>	20%
16	SUMATIVE EXAMINATION	SUMATIVE EXAMINATION	<p>Criteria: Score criteria: Special: 90 to 100; Very good: 76 to 89; Average: 56 to 75; Below average: 0 to 55</p> <p>Form of Assessment : Project Results Assessment / Product Assessment</p>	EXAM: Final Project Presentation 2 x 50 minutes	<p>Material: Summative Examination Literature: 8. <i>Drastiawati, Novi Sukma and Zakiyya, Hanna. 2018. Manufacturing Process II (Welding Techniques). Surabaya: Surabaya State University.</i></p>	30%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	30.16%
2.	Project Results Assessment / Product Assessment	58.16%
3.	Portfolio Assessment	2.5%
4.	Test	9.16%
		99.98%

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.