



**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
Machine Image	2120102129	Compulsory Study Program Subjects	T=2	P=0	ECTS=3.18	2	February 2, 2021
AUTHORIZATION	SP Developer		Course Cluster Coordinator			Study Program Coordinator	
	Akhmad Hafizh Ainur Rasyid, M.T. Diastiyana Vinaya, M.T.		Agung Prijo Budijono, S.T., M.T.			Ir. Priyo Heru Adiwibowo, S.T., M.T.	

<b>Learning model</b>	<b>Case Studies</b>																	
<b>Program Learning Outcomes (PLO)</b>	<b>PLO study program that is charged to the course</b>																	
	<b>PLO-14</b>	Science and engineering knowledge																
	<b>Program Objectives (PO)</b>																	
	<b>PO - 1</b>	Able to understand making working drawings																
	<b>PO - 2</b>	Able to plan and create working drawings																
	<b>PO - 3</b>	Skilled in using drawing equipment																
	<b>PLO-PO Matrix</b>																	
		P.O		PLO-14														
		PO-1																
		PO-2																
	PO-3																	
<b>PO Matrix at the end of each learning stage (Sub-PO)</b>																		
	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																	

**Short Course Description** Students can understand how to make sectional or cross-sectional drawings, provide dimensions in working drawings, surface configuration, size tolerances, simplified drawings, working drawings, and design software

**References**

**Main :**

- [1] Anwari. 1978. Menggambar Teknik Mesin 2. Jakarta: Departemen Pendidikan dan kebudayaan
- [2] Baharudin Yakob. 1979. Menggambar Mesin 3. Jakarta: Departemen Pendidikan dan Kebudayaan.
- [3] Juhana Ohan, Suratman. M. 2000. Menggambar Teknik Mesin. Bandung: Pustaka Grafika.
- [4] Marbun, Moyn. 1993. Menggambar Teknik Mesin. Bandung: Penerbit M2S.
- [5] Sato Takhesi, Sugiarto. 1986. Menggambar Mesin. Jakarta: Pradnya Paramita.
- [6] Yogaswara, Eka. 2004. Membaca Gambar Teknik SMK. Bandung: Armico

**Supporters:**

- <https://www.youtube.com/watch?v=h1jRXwISQXs>

**Supporting lecturer** Akhmad Hafizh Ainur Rasyid, S.T., M.T.  
Diastiana Vinaya Wijanarko, S.T., 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	Understand the rules of cut drawings	Accurate understanding of the rules for creating cut drawings	<b>Criteria:</b> Able to convey the rules for making cut images  <b>Form of Assessment</b> : Participatory Activities	Lectures and discussions in 2 X 50 classes	Lectures and discussions in 2 X 50 classes	<b>Material:</b> cut images <b>References:</b> [5] Sato Takhesi, Sugiaro. 1986. <i>Drawing Machines.</i> Jakarta: Pradnya Paramita.	3%
2	Able to understand the rules for sizing images	1.Accuracy explains the basic rules for providing measurements 2.Accuracy of explaining general classification 3.Accuracy of completing the image with dimensions	<b>Criteria:</b> 1.Able to explain the basic rules for giving measurements 2.Able to explain general classifications 3.Able to complete the image with dimensions  <b>Form of Assessment</b> : Participatory Activities	Lectures and discussions in 2 X 50 classes	Lectures and discussions in 2 X 50 classes	<b>Material:</b> <b>Library Size</b> : [5] Sato Takhesi, Sugiaro. 1986. <i>Drawing Machines.</i> Jakarta: Pradnya Paramita.	5%
3	Make drawings of objects complete with cuts and sizes	Accuracy in creating images with cuts and sizes	<b>Criteria:</b> Able to create images with cuts and sizes  <b>Form of Assessment</b> : Project Results Assessment / Product Assessment	Assignment 2 X 50	Assignment 2 X 50	<b>Material:</b> <b>Library Size</b> : [5] Sato Takhesi, Sugiaro. 1986. <i>Drawing Machines.</i> Jakarta: Pradnya Paramita.	5%
4	Understand surface configuration, and be able to use surface configuration symbols in mechanical engineering drawings	1.Precision describes the definition of surface configuration 2.Accuracy of explaining surface configuration symbols on mechanical engineering drawings 3.Accuracy of using surface configuration symbols in mechanical engineering drawings	<b>Criteria:</b> 1.Be able to explain the definition of surface configuration 2.Able to explain surface configuration symbols on mechanical engineering drawings 3.Able to use surface configuration symbols in mechanical engineering drawings	Lecture, discussion, Observation 2 X 50	Lecture, discussion, Observation 2 X 50	<b>Material:</b> surface configuration <b>References:</b> [5] Sato Takhesi, Sugiaro. 1986. <i>Drawing Machines.</i> Jakarta: Pradnya Paramita.	4%
5	Understand the use of size tolerances and their types, and read them on mechanical engineering drawings	1.Accuracy describes the use of size tolerances 2.Accuracy describes the types of size tolerances 3.Accurate reading and writing of size tolerances on drawings	<b>Criteria:</b> Explain according to the observation rubric  <b>Form of Assessment</b> : Participatory Activities	Lectures, discussions, observations 2 X 50	Lectures, discussions, observations 2 X 50	<b>Material:</b> tolerance <b>References:</b> [5] Sato Takhesi, Sugiaro. 1986. <i>Drawing Machines.</i> Jakarta: Pradnya Paramita.	4%

6	Make paired drawings of objects with descriptions of surface configurations and tolerances	<ol style="list-style-type: none"> <li>1.Accuracy in making images of paired objects with surface configuration information</li> <li>2.Accuracy in making images of paired objects accompanied by tolerance information</li> </ol>	<b>Criteria:</b> conformity with the assessment rubric  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Assignment 2 X 50	Assignment 2 X 50	<b>Material:</b> surface configuration <b>References:</b> [5] Sato Takhesi, Sugiaro. 1986. <i>Drawing Machines.</i> Jakarta: Pradnya Paramita.	5%
7	Understand the rules for simplifying thread, spring and weld drawings	<ol style="list-style-type: none"> <li>1.Precision simplifies threading</li> <li>2.Precision simplifies springs</li> <li>3.Precision simplifies welding joints</li> </ol>	<b>Criteria:</b> Explain according to the observation rubric  <b>Form of Assessment :</b> Participatory Activities	Lectures and discussions in 2 X 50 classes	Lectures and discussions in 2 X 50 classes	<b>Material:</b> image simplification <b>References:</b> [5] Sato Takhesi, Sugiaro. 1986. <i>Drawing Machines.</i> Jakarta: Pradnya Paramita.	4%
8	Sub Semester Exam	Complete the test		2 X 50	2 X 50	<b>Material:</b> Cut, Size, Tolerance, Surface Configuration <b>Reference:</b> [5] Sato Takhesi, Sugiaro. 1986. <i>Drawing Machines.</i> Jakarta: Pradnya Paramita.	4%
9	Make pictures of objects that have threads, springs, and welds	Accurate drawing of threads, springs and welds	<b>Criteria:</b> conformity with the assessment rubric  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	Assignment 2 X 50	Assignment 2 X 50	<b>Material:</b> image simplification <b>References:</b> [5] Sato Takhesi, Sugiaro. 1986. <i>Drawing Machines.</i> Jakarta: Pradnya Paramita.	5%
10	Understand the rules for simplifying drawings of gears and bearings	<ol style="list-style-type: none"> <li>1.Precision simplifies gears</li> <li>2.Precision simplifies bearing</li> </ol>	<b>Criteria:</b> Explain according to the observation rubric  <b>Form of Assessment :</b> Participatory Activities	Lectures, discussions, assignments 2 X 50	Lectures, discussions, assignments 2 X 50	<b>Material:</b> image simplification <b>References:</b> [5] Sato Takhesi, Sugiaro. 1986. <i>Drawing Machines.</i> Jakarta: Pradnya Paramita.	4%
11	Make a picture of an object that has gears and bearings	Accurate drawing of gears and bearings	<b>Criteria:</b> conformity with the assessment rubric  <b>Form of Assessment :</b> Project Results Assessment / Product Assessment	2 X 50 exercises and assignments	2 X 50 exercises and assignments	<b>Material:</b> image simplification <b>References:</b> [5] Sato Takhesi, Sugiaro. 1986. <i>Drawing Machines.</i> Jakarta: Pradnya Paramita.	5%

12	Understand the creation of working drawings	1.Accuracy in explaining the making of part drawings (detail drawings) 2.Accuracy in explaining the creation of a combined drawing (assembly drawing)	<b>Form of Assessment</b> : Participatory Activities	Lecture, discussion 2 X 50	Lecture, discussion 2 X 50	<b>Material:</b> Working drawings <b>References:</b> [5] Sato Takhesi, Sugiaro. 1986. <i>Drawing Machines.</i> Jakarta: Pradnya Paramita.	3%
13	Create working drawings	Accuracy in making working drawings	<b>Criteria:</b> conformity with the assessment rubric  <b>Form of Assessment</b> : Project Results Assessment / Product Assessment	2 X 50 exercises and assignments	2 X 50 exercises and assignments	<b>Material:</b> Working drawings <b>References:</b> [5] Sato Takhesi, Sugiaro. 1986. <i>Drawing Machines.</i> Jakarta: Pradnya Paramita.	20%
14	Able to read and evaluate working drawings	Accuracy in reading and evaluating working drawings	<b>Criteria:</b> Explain according to the observation rubric  <b>Form of Assessment</b> : Practice / Performance	Assignment 2 X 50	Assignment 2 X 50	<b>Material:</b> Working drawings <b>References:</b> [5] Sato Takhesi, Sugiaro. 1986. <i>Drawing Machines.</i> Jakarta: Pradnya Paramita.	20%
15	Create working drawings using design software	Accuracy in creating working drawings using design software	<b>Criteria:</b> Explain according to the observation rubric  <b>Form of Assessment</b> : Project Results Assessment / Product Assessment	Lectures and exercises 2 X 50	Lectures and exercises 2 X 50		5%
16	Summative Exam	Complete the test		2 X 50	2 X 50	<b>Material:</b> image simplification, working drawings <b>References:</b> [5] Sato Takhesi, Sugiaro. 1986. <i>Drawing Machines.</i> Jakarta: Pradnya Paramita.	4%

#### Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	23%
2.	Project Results Assessment / Product Assessment	45%
3.	Practice / Performance	20%
		88%

#### 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.