



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

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight	SEMESTER	Compilation Date		
Drawing Machines	99992140103022		T=3 P=0 ECTS=4.77	2	February 1, 2024		
AUTHORIZATION	SP Developer		Course Cluster Coordinator		Study Program Coordinator		
	Andita Nataria Fitri Ganda, Dewi Puspitasari		Ferly Isnomo Abdi		Arya Mahendra Sakti, S.T., M.T.		
Learning model	Project Based Learning						
Program Learning Outcomes (PLO)	PLO study program which is charged to the course						
	Program Objectives (PO)						
	PLO-PO Matrix						
		P.O					
Short Course Description	Students can understand how to draw cuts, special drawings, give measurements, give work symbols, draw machine parts and make working drawings.						
	References						
References	Main :						
	1. [1] Anwari. 1978. Menggambar Teknik Mesin 2. Jakarta: Departemen Pendidikan dan kebudayaan 2. [2] Baharudin Yakob. 1979. Menggambar Mesin 3. Jakarta: Departemen Pendidikan dan Kebudayaan. 3. [3] Juhana Ohan, Suratman. M. 2000. Menggambar Teknik Mesin. Bandung: Pustaka Grafika. 4. [4] Marbun, Moyn. 1993. Menggambar Teknik Mesin. Bandung: Penerbit M2S. 5. [5] Sato Takhesi, Sugiarto. 1986. Menggambar Mesin. Jakarta: Pradnya Paramita. 6. [6] Yogaswara, Eka. 2004. Membaca Gambar Teknik SMK. Bandung: Armico						
Supporting lecturer	Supporters:						
Supporting lecturer	Andita Nataria Fitri Ganda, S.T., M.Sc. Ferly Isnomo Abdi, S.T., 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	Be able to mention various technical drawing equipment	Choose a drawing tool that suits your needs	Criteria: 1. Able to show each drawing tool and its function 2. Able to draw using drawing equipment Form of Assessment : Participatory Activities	Question and answer discussion lecture and 3 X 50 exercises			10%

2	Able to draw working drawings of structures and parts	Skilled at drawing lines with different thicknesses Skilled at drawing letters using a letter mall	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Be able to name various types of lines. 2.Be able to explain the function of each type of line. 3.Able to explain various types of letters. 4.Able to draw lines according to procedures. <p>Form of Assessment : Participatory Activities, Practice/Performance</p>	Lectures, discussions, questions and answers, exercises and assignments 6 X 50		<p>Material: Drawings, composition and parts References: [5] Sato Takhesi, Sugiarto. 1986. <i>Drawing Machines</i>. Jakarta: Pradnya Paramita.</p>	5%
3	Able to draw working drawings of structures and parts	Students are able to draw working drawings using American projection	<p>Criteria: Training results</p> <p>Form of Assessment : Participatory Activities</p>	6x50		<p>Material: Image Arrangement and Parts Bibliography: [4] Marbun, Moyn. 1993. <i>Mechanical Engineering Drawing</i>. Bandung: M2S Publisher.</p>	5%
4	Able to understand machining symbols and tolerances on work drawings	Describe the definition of machining Describe casting cutting parameters Identify types of cutting tools and machines Identify various defects and quality problems	<p>Criteria: Understand machining symbols and tolerances</p> <p>Form of Assessment : Participatory Activities, Tests</p>	Lectures, discussions, questions and answers, exercises and assignments 3 X 50		<p>Material: Tolerance Literature: [5] Sato Takhesi, Sugiarto. 1986. <i>Drawing Machines</i>. Jakarta: Pradnya Paramita.</p>	5%
5	Able to design and draw working drawings of openings	Able to identify and draw working drawings of openings	<p>Criteria: Practice Results</p> <p>Form of Assessment : Practice / Performance</p>	Lectures and Practice 6x50		<p>Material: Isometry and Orthogonal Projections References: [1] Anwari. 1978. <i>Mechanical Engineering Drawing 2</i>. Jakarta: Department of Education and Culture</p>	5%
6	Able to draw custom cuts and depictions	Skilled in drawing objects that are cut off. Skilled in drawing objects with a special view	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Able to explain the function of cut images. 2.Able to explain how to cut objects. 3.Able to explain how to place cut images. 4.Able to explain the rules for drawing shading. 5.Able to name various kinds of cut pictures. 6.Able to identify specific depictions of objects 7.Able to draw shading. 8.Able to draw various types of pieces. 9.Able to draw special objects. <p>Form of Assessment : Practice / Performance</p>	Lectures, discussions, questions and answers, exercises and assignments 6 X 50		<p>Material: Isometry and Sections References: [5] Sato Takhesi, Sugiarto. 1986. <i>Drawing Machines</i>. Jakarta: Pradnya Paramita.</p>	5%

7	Able to draw custom cuts and depictions	Skilled in drawing objects that are cut off. Skilled in drawing objects with a special view	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Able to explain the function of cut images. 2.Able to explain how to cut objects. 3.Able to explain how to place cut images. 4.Able to explain the rules for drawing shading. 5.Able to name various kinds of cut pictures. 6.Able to identify specific depictions of objects 7.Able to draw shading. 8.Able to draw various types of pieces. 9.Able to draw special objects. <p>Form of Assessment : Practice / Performance</p>	Lectures, discussions, questions and answers, exercises and assignments 6 X 50		<p>Material: Isometry and Sections References: [5] Sato Takhesi, Sugiarto. 1986. <i>Drawing Machines</i>. Jakarta: Pradnya Paramita.</p>	5%
8			<p>Form of Assessment : Test</p>	UTS 3 X 50			10%
9	Able to size images and add workmanship symbols to images	Skilled in drawing with dimensions Skilled in drawing with symbols of workmanship	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Able to draw techniques to their size 2.Able to draw techniques and their working symbols <p>Form of Assessment : Practice / Performance</p>	Lectures, discussions, questions and answers, exercises and assignments 6 X 50		<p>Material: Construction Working Drawings References: [5] Sato Takhesi, Sugiarto. 1986. <i>Drawing Machines</i>. Jakarta: Pradnya Paramita.</p>	5%
10	Able to design and draw working drawings of precision objects in pairs	Able to draw working drawings of precision objects in pairs	<p>Criteria: Practice Results</p> <p>Form of Assessment : Practice / Performance</p>	Lectures and Practice 6x50		<p>Material: Working drawings of precision objects in pairs. Reference: [2] Baharudin Yakob. 1979. <i>Drawing Machines</i> 3. Jakarta: Department of Education and Culture.</p>	5%
11	Able to design and draw working drawings of lifting equipment	Skilled in drawing machine parts	<p>Criteria:</p> <ol style="list-style-type: none"> 1.Able to draw threads and springs 2.Able to draw gears 3.Able to draw objects being welded <p>Form of Assessment : Practice / Performance</p>	Lectures, discussions, questions and answers, exercises and assignments 6 X 50		<p>Material: Working drawings of conveyance equipment References: [5] Sato Takhesi, Sugiarto. 1986. <i>Drawing Machines</i>. Jakarta: Pradnya Paramita.</p>	5%
12	Able to design and draw simple machine working drawings		<p>Form of Assessment : Project Results Assessment / Product Assessment</p>	Lectures and Practice 7x50		<p>Material: Simple machine working drawings References: [5] Sato Takhesi, Sugiarto. 1986. <i>Drawing Machines</i>. Jakarta: Pradnya Paramita.</p>	5%

13	Able to design and draw simple machine working drawings	Skilled in making working drawings	Criteria: Can draw machine components in detail Form of Assessment : Project Results Assessment / Product Assessment	Lectures and Practice 7x50		Material: Simple machine working drawings References: [5] Sato Takhesi, Sugiarto. 1986. <i>Drawing Machines</i> . Jakarta: Pradnya Paramita.	5%
14	Able to design and draw simple machine working drawings	Skilled in making working drawings	Criteria: Can draw machine components in detail Form of Assessment : Project Results Assessment / Product Assessment	Lectures and Practice 7x50		Material: Simple machine working drawings References: [5] Sato Takhesi, Sugiarto. 1986. <i>Drawing Machines</i> . Jakarta: Pradnya Paramita.	5%
15	Able to design and draw simple machine working drawings	Skilled in making working drawings	Criteria: Can draw machine components in detail Form of Assessment : Project Results Assessment / Product Assessment	Lectures and Practice 7x50		Material: Simple machine working drawings References: [5] Sato Takhesi, Sugiarto. 1986. <i>Drawing Machines</i> . Jakarta: Pradnya Paramita.	5%
16			Criteria: 1.Cleanliness and neatness of images 2.Use of drawing rules according to ISO standards Form of Assessment : Project Results Assessment / Product Assessment	Project 3x50			15%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	20%
2.	Project Results Assessment / Product Assessment	35%
3.	Practice / Performance	32.5%
4.	Test	12.5%
		100%

Notes

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Forms of assessment:** test and non-test.
- 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.
- 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.