	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 techniques	xx21401020647	Compulsory Study Program Subjects	**T=3**	**P=0**	**ECTS=4.77**	1	June 5, 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 which is charged to the course**	
	PLO-3	Develop logical, critical, systematic and creative thinking in carrying out specific work in their field of expertise and in accordance with work competency standards in the field concerned
	PLO-4	Develop yourself continuously and collaborate.
	PLO-8	Designing components, systems and/or mechanical processes to meet expected needs with an analytical approach to engineering based on the latest manufacturing science and technology and considering technical standards, performance aspects, reliability and ease of application, and/or utilizing the potential of local and national resources with insight global.
	PLO-9	Able to apply knowledge of mathematics, science and/or materials, and engineering to gain a thorough understanding of engineering principles.
	Program Objectives (PO)	
	PLO-PO Matrix	

P.O	PLO-3	PLO-4	PLO-8	PLO-9

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

Short Course Description	In this course students learn about making pictures from real objects, planning pictures, and skills in using drawing equipment using learning forms in the form of lectures, practice, planning and using various learning methods in the form of group discussions, case studies, and project-based learning.

References	**Main :**

1. Abryandoko, Eko W. 2020. Widina Bhakti Persada Menggambar Teknik.
2. Muhammad Khumaedi, Dwi Widjanarko, Andri Setiawan. 2020. Gambar Teknik Mesin.

Supporters:

1. www.teachertube.com/video/orthographic-projection-252358
2. https://www.youtube.com/watch?v=h1jRXwlSQXs

Supporting lecturer	Agung Prijo Budijono, S.T., M.T. Andita Nataria Fitri Ganda, S.T., M.Sc. Ferly Isnomo Abdi, S.T., S.Pd., M.T. Dewi Puspitasari, S.Pd., M.Sc.

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 the function of technical drawings		**Form of Assessment** : Participatory Activities	Lectures, discussions, questions and answers 3 X 50	Lectures, discussions, questions and answers 3 X 50	**Material:** Introduction (Technical Drawing Functions) **References:** *Muhammad Khumaedi, Dwi Widjanarko, Andri Setiawan. 2020. Mechanical Engineering Drawing.*	2%

No	Ability	Indicator	Criteria & Form of Assessment	Learning Method	Learning Method	Materials / Literature	Weight
2	Able to mention various technical drawing tools, geometric constructions, and letters	1. Accuracy in identifying at least 4 main drawing tools 2. Accuracy of identifying geometric constructions 3. Accuracy of identifying letters according to ISO standards	**Criteria:** conformity with the answer key **Form of Assessment** : Participatory Activities	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	**Materials:** Image Equipment **Literature:** *Muhammad Khumaedi, Dwi Widjanarko, Andri Setiawan. 2020. Mechanical Engineering Drawing.*	2%
3	Able to create geometry	Accuracy in creating geometric images	**Criteria:** Students are able to complete the assignments given and are assessed according to the assessment rubric **Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	**Material:** geometric drawing Bibliography : *Abryandoko, Eko W. 2020. Widina Bhakti Persada Drawing Techniques.*	4%
4	Able to explain the various lines and their uses in technical drawings	1. Accuracy in explaining various lines 2. Accuracy of applying lines to images according to ISO standards	**Criteria:** conformity with the observation rubric **Form of Assessment** : Participatory Activities	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	**Material:** Bibliography : *Muhammad Khumaedi, Dwi Widjanarko, Andri Setiawan. 2020. Mechanical Engineering Drawing.*	2%
5	Be able to explain the rules of pictorial projection	Accurate understanding of pictorial projection rules	**Criteria:** conformity with the answer key **Form of Assessment** : Participatory Activities	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	**Material:** projection **Bibliography:** *Muhammad Khumaedi, Dwi Widjanarko, Andri Setiawan. 2020. Mechanical Engineering Drawing.*	2%
6	Able to create images of objects using pictorial projection rules	1. Accuracy of creating images using isometry projection rules 2. Accuracy of creating images using dimetric projection rules	**Criteria:** conformity with the assessment rubric **Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	**Material:** Projection **Bibliography:** *Muhammad Khumaedi, Dwi Widjanarko, Andri Setiawan. 2020. Mechanical Engineering Drawing.* **Material: Library** Projection : *https://www.youtube.com/...*	5%
7	Be able to explain the rules of orthogonal projection	1. The accuracy of understanding the American orthogonal projection rule 2. The accuracy of understanding the European orthogonal projection rules	**Criteria:** conformity with the observation rubric **Form of Assessment** : Participatory Activities	Lectures, discussions, questions and answers, practice 3 X 50	Lectures, discussions, questions and answers, practice 3 X 50	**Material:** Projection **Bibliography:** *Abryandoko, Eko W. 2020. Widina Bhakti Persada Drawing Techniques.* **Material: Library** Projection : *https://www.youtube.com/...*	2%
8	sub summative exam	able to solve USS questions	**Criteria:** Complete USS questions according to the assessment rubric **Form of Assessment** : Test	solve the USS 3 X 50 problem	solve the USS 3 X 50 problem	**Material:** All **Library Material:** *Abryandoko, Eko W. 2020. Widina Bhakti Persada Drawing Techniques.*	20%
9	Project assignments	Accuracy of creating images using American projection rules	**Criteria:** conformity with the assessment rubric **Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	**Material:** Projection **Bibliography:** *Muhammad Khumaedi, Dwi Widjanarko, Andri Setiawan. 2020. Mechanical Engineering Drawing.* **Material: Library** Projection : *https://www.youtube.com/...*	5%

10	Able to create images of objects using European orthogonal projection rules	Accuracy of creating images using European projection rules	**Criteria:** conformity with the assessment rubric **Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	**Material:** Projection **Bibliography:** *Abryandoko, Eko W. 2020. Widina Bhakti Persada Drawing Techniques.* **Material: Library** Projection : *https://www.youtube.com/...*	5%
11	Able to explain the rules of cut drawings	Accurate understanding of the rules for creating cut drawings	**Criteria:** conformity with the answer key **Form of Assessment** : Participatory Activities	Lectures, discussions, questions and answers, practice 3 X 50	Lectures, discussions, questions and answers, practice 3 X 50	**Material: Library** pieces : *Muhammad Khumaedi, Dwi Widjanarko, Andri Setiawan. 2020. Mechanical Engineering Drawing.*	2%
12	Able to create projection images equipped with cuts	Accuracy of creating images with cuts	**Criteria:** conformity with the assessment rubric **Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	Lectures, discussions, questions and answers, exercises and assignments 3 X 50		5%
13	Able to create 3D to 2D images using projection rules and equipped with cuts	The accuracy of creating 3D images into 2D using projection rules and equipped with cuts	**Criteria:** The accuracy of creating 3D images into 2D using projection rules and equipped with cuts **Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	**Material:** Projection **Bibliography:** *Muhammad Khumaedi, Dwi Widjanarko, Andri Setiawan. 2020. Mechanical Engineering Drawing.*	5%
14	Able to create 3D to 2D images using projection rules and equipped with cuts	The accuracy of creating 3D images into 2D using projection rules and equipped with cuts	**Criteria:** The accuracy of creating 3D images into 2D using projection rules and equipped with cuts **Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	Lectures, discussions, questions and answers, exercises and assignments 3 X 50	**Material:** Projection **Bibliography:** *Muhammad Khumaedi, Dwi Widjanarko, Andri Setiawan. 2020. Mechanical Engineering Drawing.*	5%
15	Able to evaluate the use of projections and cuts in images	Accuracy of evaluating images	**Criteria:** suitability of answers to the key **Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, practice 3 X 50	Lectures, discussions, questions and answers, practice 3 X 50	**Material:** Projection **Bibliography:** *Muhammad Khumaedi, Dwi Widjanarko, Andri Setiawan. 2020. Mechanical Engineering Drawing.*	4%
16	summative exam	able to solve USS questions	**Criteria:** Complete USS questions according to the assessment rubric **Form of Assessment** : Test	able to solve USS 3 X 50 questions	able to solve USS 3 X 50 questions	**Material:** all material **Reader:** *Muhammad Khumaedi, Dwi Widjanarko, Andri Setiawan. 2020. Mechanical Engineering Drawing.* **Material:** all materials **Reference:** *Abryandoko, Eko W. 2020. Widina Bhakti Persada Drawing Techniques.*	30%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	12%
2.	Project Results Assessment / Product Assessment	38%
3.	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** 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.