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

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
CAD/CAM	2130203033		T=3	P=0	ECTS=4.77	4	July 17, 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**
	Program Objectives (PO)
	PLO-PO Matrix

P.O

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	This course is an understanding of designing drawings of workpiece parts, programming and CNC (Computer Numerically Controlled) machining processes and their development.
References	**Main :**

1. CNC Software Inc. 2002. Mastercam. USA
2. Emco. 1992. Student handbook TU 3A. Austria
3. Emco Maier. 1990. Ges Mbh Student Handbook EMCO TU-3A A 5000 Hallein, Australia
4. Emco Maier & Cc.1988. Petunjuk pemrograman TU-3A. Hallein, Austria: Frriedman-Maier.

	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	Skilled in using the image geometry analysis menu	Skilled in using point, contour, only, between points angle, dynamic, area/volume, number, chain and surface analysis	**Criteria:** Design according to job sheet **Form of Assessment** : Practice / Performance	Lectures, discussions, questions and answers, exercises, practice and assignments 3 X 50			3%
2	Skilled in using the create menu	Skilled in using create point, line, arc, fillet, spline.	**Criteria:** Design according to job sheet **Form of Assessment** : Practice / Performance	Lectures, discussions, questions and answers, exercises, practice and assignments 3 X 50			3%
3	Skilled in using the create menu	Skilled in using create curve, surface, rectangle, drafting, next menu	**Criteria:** Design according to job sheet **Form of Assessment** : Practice / Performance	Lectures, discussions, questions and answers, exercises, practice and assignments 3 X 50			5%
4	Skilled in using the arc menu	Skilled in using polar arcs, endpoints, 3 points, tangents	**Criteria:** Design according to job sheet **Form of Assessment** : Practice / Performance	Lectures, discussions, questions and answers, exercises, practice and assignments 3 X 50			5%
5	Skilled in using the arc menu	Skilled in using arc circle 2 points, circle 3 points, circle points radius, circle points diameter, circle points edge	**Criteria:** Design according to job sheet **Form of Assessment** : Practice / Performance	Lectures, discussions, questions and answers, exercises, practice and assignments 3 X 50			3%
6	Skilled in using the file menu	Skilled in using the file menu	**Criteria:** Design according to job sheet **Form of Assessment** : Practice / Performance	Lectures, discussions, questions and answers, exercises, practice and assignments 3 X 50			5%
7	Skilled in using the modify menu	Skilled in using modify fillet, trim, break, join and normal	**Criteria:** Design according to job sheet **Form of Assessment** : Practice / Performance	Lectures, discussions, questions and answers, exercises, practice and assignments 3 X 50			5%
8	UTS	1. Skilled in using the analyze, create, file and modify menus 2. Skilled in designing using the analyze, create, file and modify menus	**Criteria:** Design according to job sheet **Form of Assessment** : Practical Assessment	Practice 3 X 50			20%

9	UTS	1. Skilled in using the analyze, create, file and modify menus 2. Skilled in designing using the analyze, create, file and modify menus	**Criteria:** Design according to job sheet **Form of Assessment** : Practice / Performance	Practice 3 X 50			5%
10	Able to design and use CAE software	Students are able to create simple designs	**Criteria:** Practice Results **Form of Assessment** : Practice / Performance	Practice 120 minutes			5%
11	Able to design and use CAE software	Students are able to create simple designs	**Criteria:** Practice Results **Form of Assessment** : Practice / Performance	Practice 120 minutes			5%
12	Able to design and use CAE software	Students are able to create simple designs	**Criteria:** Practice Results **Form of Assessment** : Practice / Performance	Practice 120 minutes			5%
13	Able to design and use CAE software	Students are able to create simple designs	**Criteria:** Practice Results **Form of Assessment** : Practice / Performance	Practice 120 minutes			5%
14	Able to design and use CAE software	Students are able to create simple designs	**Criteria:** Practice Results **Form of Assessment** : Practice / Performance	Practice 120 minutes			5%
15	Able to design and use CAE software	Students are able to create simple designs	**Criteria:** Practice Results **Form of Assessment** : Practice / Performance	Practice 120 minutes			6%
16	Able to design and use CAE software	Students are able to create simple designs	**Criteria:** Practice Results **Form of Assessment** : Assessment of Project Results / Product Assessment, Practices / Performance	Practice 120 minutes			15%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Project Results Assessment / Product Assessment	7.5%
2.	Practical Assessment	20%
3.	Practice / Performance	72.5%
		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.