

		Universitas Negeri Surabaya Faculty of Engineering, Mechanical Engineering Education Undergraduate Study Program					Document Code																																										
SEMESTER LEARNING PLAN																																																	
Courses		CODE	Course Family		Credit Weight		SEMESTER	Compilation Date																																									
CAD and CAM		8320303262			T=0	P=3	ECTS=4.77	0 July 17, 2024																																									
AUTHORIZATION		SP Developer		Course Cluster Coordinator		Study Program Coordinator																																											
			Ir. Wahyu Dwi Kurniawan, S.Pd., M.Pd.																																											
Learning model	Project Based Learning																																																
Program Learning Outcomes (PLO)	PLO study program that is charged to the course																																																
	Program Objectives (PO)																																																
	PLO-PO Matrix																																																
		<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 100px; height: 30px;">P.O</td> </tr> </table>							P.O																																								
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	PO Matrix at the end of each learning stage (Sub-PO)																																																
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2" style="width: 30px; height: 30px;">P.O</td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 20px;">1</td> <td style="width: 20px;">2</td> <td style="width: 20px;">3</td> <td style="width: 20px;">4</td> <td style="width: 20px;">5</td> <td style="width: 20px;">6</td> <td style="width: 20px;">7</td> <td style="width: 20px;">8</td> <td style="width: 20px;">9</td> <td style="width: 20px;">10</td> <td style="width: 20px;">11</td> <td style="width: 20px;">12</td> <td style="width: 20px;">13</td> <td style="width: 20px;">14</td> <td style="width: 20px;">15</td> <td style="width: 20px;">16</td> </tr> </table>																P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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Short Course Description	Understanding of drawing the design of Mechanical Engineering components according to ISO standards with the help of a computer along with working drawings, assembling, animation and component analysis																																																
References	Main :																																																
	<ol style="list-style-type: none"> 1. Hidayat, Nur & Ahmad Shanhaji. 2011. Autodesk Inventor: Mastering 3D Mechanical Design. Jakarta: Informatika 2. Santoso, Khomeni. 2009. Menggambar Mesin dengan Perintah Autocad. Jakarta: PT. Indeks 3. Darmawan, Djoko. 2004. Autocad 2002 untuk Teknik Mesin dan Industri. Jakarta: Elexmedia Komputindo 4. Sugiarto, N & G. Takhesi Sato. 2002. Menggambar Teknik Menurut Standar ISO. Jakarta: Pradnya Paramita 5. Tutorial AutoCAD dan Tutorial Autodesk Inventor 																																																
	Supporters:																																																
Supporting lecturer	Akhmad Hafizh Ainur Rasyid, 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]	Assesment Weight (%)																																										
		Indicator	Criteria & Form	Offline (offline)	Online (online)																																												
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)																																										

1	Get to know the display, how to set the size of the image area, create line images, and delete images	Students can open a CAD program; Students are able to use existing toolbars	Criteria: Students can open and use existing toolbars	Lectures, discussions, exercises 100 minutes			0%
2	Determining extreme points in the image, creating an image according to ISO standards, creating inscriptions, sizing the image, cutting part of the lines	Determining extreme points in the image and their application, creating labels and writing, sizing the image and its arrangement, understanding how to cut part of the line	Criteria: Students can open and use existing toolbars	Lectures, discussions, exercises 100 minutes			0%
3	Setting the image on paper, printing the image	understand how to set up images and print them	Criteria: Students can open and use existing toolbars	Lectures, discussions, exercises 100 minutes			0%
4	Able to create working drawings and modify them	Students are able to understand the use of the draw toolbar, and modify sketches, students are able to draw 2D using their respective toolbars correctly	Criteria: Students can open and use existing toolbars	Lectures, discussions, exercises 100 minutes			0%
5	Get to know the toolbar and use it, create sketches for basic 3-dimensional shapes with one sketch	Students are able to understand the use of the sketch toolbar, and modify sketches, students are able to draw 3D	Criteria: Students can open and use existing toolbars	Lectures, discussions, exercises 100 minutes			0%
6	Move, rotate and modify the image area, create 3-dimensional shapes with 2 or more sketches	Students are able to understand the use of the sketch toolbar, and modify sketches, students are able to draw 3D	Criteria: Students can open and use existing toolbars	Lectures, discussions, exercises 100 minutes			0%
7	Create working drawings from 3-dimensional images in accordance with ISO standards	Students are able to understand how to make working drawings from 3D images	Criteria: Students can open and use existing toolbars	Lectures, discussions, exercises 100 minutes			0%
8	U.S.S	All meeting materials 1 -7	Criteria: Students can open and use existing toolbars	100 minute exam			0%
9	Understand how to assemble images from created images and standard images (retrieve parts from the database)	Students are able to assemble component images into assembly images	Criteria: Students can open and use existing toolbars	Lectures, discussions, exercises 100 minutes			0%
10	Understand how to assemble images from created images and standard images (retrieve parts from the database)	Students are able to assemble component images into assembly images	Criteria: Students can open and use existing toolbars	Lectures, discussions, exercises 100 minutes			0%

11	Understand how to make standard parts with the help of Design	Students are able to assemble component drawings from standard components	Criteria: Students can open and use existing toolbars	Lectures, discussions, exercises 100 minutes			0%
12	Understand how to make standard parts with the help of Design	Students are able to assemble component drawings from standard components	Criteria: Students can open and use existing toolbars	Lectures, discussions, exercises 100 minutes			0%
13	Understand how to create assembling process animations and simple working methods	Students are able to break down assembling images into unit images	Criteria: Students can open and use existing toolbars	Lectures, discussions, exercises 100 minutes			0%
14	Analyze the strength of designed components and understand how to visualize 3D images into more realistic images	Students are able to analyze the components of a given force	Criteria: Students can open and use existing toolbars	Lectures, discussions, exercises 100 minutes			0%
15	Create drawings of complex machine circuits	All indicators	Criteria: Students can open and use existing toolbars	100 minutes of discussion, consultation and presentation			0%
16	Create drawings of complex machine circuits	All indicators	Criteria: Students can open and use existing toolbars	100 minute exam			0%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
		0%

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** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities 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.
- Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
- 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%.
- TM=Face to face, PT=Structured assignments, BM=Independent study.

