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

SEMESTER LEARNING PLAN

Courses		**CODE**	**Course Family**	**Credit Weight**			**SEMESTER**	**Compilation Date**
Mechatronics		2130203038		**T=3**	**P=0**	**ECTS=4.77**	5	July 17, 2024

AUTHORIZATION		**SP Developer**		**Course Cluster Coordinator**		**Study Program Coordinator**
		....		....		Arya Mahendra Sakti, S.T., M.T.

Learning model	**Case Studies**

Program Learning Outcomes (PLO)	**PLO study program that 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	Understanding of setting/controlling mechanical system equipment that works automatically

References	**Main :**

1. Adi, A.N. 2010, Mekatronika. Yogyakarta: Graha Ilmu.
2. Bolton, W. 2006. Sistem Instrumentasi dan Sistem Kontrol. Jakarta: Penerbit Erlangga
3. Bolton, W. 1999. Mechatronics, Second Edition. England: Prentice Hall.
4. Dunn, William C. 2005. Fundamentals of Industrial Istrumentation and Process Control.USA: Mc Graw-Hill Companies, Inc.
5. Johnson, C.D. 2003. Process Control Instrumentation Technology, Seventh Edition. USA: Prentice Hall Inc., New Jersey.
6. Kurikulum Jurusan Teknik Mesin FT Unesa, Mata Kuliah Mekatronika.

Supporters:

Supporting lecturer	

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	Students are able to describe the basic principles of mechatronics	Can describe the basic principles of mechatronics	**Criteria:** 1.a. Presence 2.b. Activeness in attending lectures 3.c. Compliance with the answer key	Lectures, discussions, questions and answers, exercises and assignments 2 X 50			0%
2	Students are able to describe control systems through case study examples	Designing a block diagram of a control system	**Criteria:** 1.a. Presence 2.b. Activeness in attending lectures 3.c. Compliance with the answer key	Lectures, discussions, questions and answers, exercises and assignments 4 X 50			0%
3							0%
4	Students are able to identify various types of sensors and their applications	Describe the functions and applications of 5 types of sensors	**Criteria:** 1.a. Presence 2.b. Activeness in attending lectures 3.c. Compliance with the answer key	Lectures, discussions, questions and answers, exercises and assignments 4 X 50			0%
5							0%
6	Students are able to describe the concept of signal conditioning	Identify signal conditioning in an automatic control system	**Criteria:** c. Compliance with the answer key	Lectures, discussions, questions and answers, exercises and assignments 4 X 50			0%
7							0%
8	Sub Summative Exam	Sub Summative Exam	**Criteria:** Compliance with the answer key	Sub Summative Exam 2 X 50			0%
9	Students are able to describe basic logic gates	Describe the different working principles of basic logic gates	**Criteria:** 1.a. Presence 2.b. Activeness in attending lectures 3.c. Compliance with the answer key	Lectures, discussions, questions and answers, exercises and assignments 2 X 50			0%
10	Students are able to understand relay control systems	Understand the working principle of relays. Understand relay functions. Understand relay control systems	**Criteria:** 1.Presence 2.Activeness in attending lectures 3.Compliance with the answer key	Lectures, discussions, questions and answers, exercises and assignments 2 X 50			0%
11	Students are able to design relay control circuits using EKTS software	Designing a relay control circuit with EKTS software	**Criteria:** 1.Presence 2.Activeness in attending lectures 3.Compliance with the answer key	Lectures, discussions, questions and answers, exercises and assignments 2 X 50			0%

12	Students are able to complete jobsheet 1 series of DOL Students are able to complete jobsheet 2 series of control 2 places	Designing ladder diagrams using the Cx application. Programmer	**Criteria:** 1.Presence 2.Activeness in attending lectures 3.Compliance with the answer key	Lectures, discussions, questions and answers, exercises and assignments 2 X 50			0%
13							0%
14	Students are able to complete the jobsheet for 3 series of interlocks. Students are able to complete the jobsheet for 4 series of automatic garage doors	Students are able to complete the jobsheet for 3 series of interlocks. Students are able to complete the jobsheet for 4 series of automatic garage doors	**Criteria:** 1.Presence 2.Activeness in attending lectures 3.Compliance with the answer key	Lectures, discussions, questions and answers, practical exercises and assignments 2 X 50			0%
15							0%
16							0%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
		0%

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.