	Universitas Negeri Surabaya Faculty of Engineering, Electrical Engineering Undergraduate Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Control Signal Processing	2020103117		T=3	P=0	ECTS=4.77	5	July 18, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	Dr. Lusia Rakhmawati, 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	This course is an explanation of the concepts of identification and estimation, system modeling in control signal processing, changing the time domain into the frequency domain using the Laplace Transformation, changing a discrete time signal into a complex form in the frequency domain using the Z Transformation, an integral transformation which restates a functions in sinusoidal basis functions using Fourier transformation, as well as filters in control signal processing such as Kalman filters, Wiener filters, and others.
References	**Main :**
	1. Harold Wayne Sorenson . 1985. Kalman Filtering: Theory and Application. IEEE Press. 2. Lennart Ljung. 1999. System Identification: Theory for the User. Prentice Hall PTR - New Jersey.
	Supporters:
Supporting lecturer	Endryansyah, S.T., M.T. Dr. Puput Wanarti Rusimamto, S.T., M.T. Miftahur Rohman, 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]	Assessment Weight (%)
		Indicator	Criteria & Form	Offline (*offline*)	Online (*online*)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

1	Students are able to explain basic knowledge of control concepts, signals and systems in control signal processing	Students are able to explain basic knowledge of control, signal and system concepts	**Criteria:** 1.Value Criteria: 2.Special: 90 to 100; 3.Very Good: 76 to 89; 4.Average: 56 to 75; 5.Below average: 0 to 55	Lectures, Discussions 3 X 50			0%
2	Students are able to explain basic knowledge of control concepts, signals and systems in control signal processing	Students are able to explain basic knowledge of control, signal and system concepts	**Criteria:** 1.Value Criteria: 2.Special: 90 to 100; 3.Very Good: 76 to 89; 4.Average: 56 to 75; 5.Below average: 0 to 55	Lectures, Discussions 3 X 50			0%
3	Students are able to explain basic knowledge of the Laplace Transform	Students are able to explain basic knowledge of the Laplace Transformation, recognize the Laplace Transformation, and its use	**Criteria:** 1.Value Criteria: 2.Special: 90 to 100; 3.Very Good: 76 to 89; 4.Average: 56 to 75; 5.Below average: 0 to 55	Lecture, Discussion, 3 X 50			0%
4	Students are able to understand and explain several Laplace Transformation questions using manual calculations	Students are able to understand and explain several Laplace Transformation questions using manual calculations	**Criteria:** 1.Value Criteria: 2.Special: 90 to 100; 3.Very Good: 76 to 89; 4.Average: 56 to 75; 5.Below average: 0 to 55	Lecture, Discussion, 3 X 50			0%
5	Students are able to understand and explain the properties of the Laplace Transformation	Students are able to understand and explain the properties of the Laplace Transformation	**Criteria:** 1.Value Criteria: 2.Special: 90 to 100; 3.Very Good: 76 to 89; 4.Average: 56 to 75; 5.Below average: 0 to 55	Lectures, Discussions 3 X 50			0%
6	Students are able to understand and explain the proof of the Laplace transformation table using manual calculations	Students are able to understand and explain the proof of the Laplace transformation table using manual calculations	**Criteria:** 1.Value Criteria: 2.Special: 90 to 100; 3.Very Good: 76 to 89; 4.Average: 56 to 75; 5.Below average: 0 to 55	Lectures, Discussions 3 X 50			0%
7	Able to explain and solve Fractional Laplace transforms with different roots	Able to explain and solve Fractional Laplace transforms with different roots	**Criteria:** 1.Value Criteria: 2.Special: 90 to 100; 3.Very Good: 76 to 89; 4.Average: 56 to 75; 5.Below average: 0 to 55	Lectures, Discussions 3 X 50			0%

8	Sub-summative exam / mid-term exam material from meetings 1 - 7	Sub-summative exam / mid-term exam material from meetings 1 - 7	**Criteria:** 1.Value Criteria: 2.Special: 90 to 100; 3.Very Good: 76 to 89; 4.Average: 56 to 75; 5.Below average: 0 to 55	Online exam 3 X 50			0%
9	Able to explain and solve Laplace transformation fractions that have double roots	Able to explain and solve Laplace transformation fractions that have double roots	**Criteria:** 1.Value Criteria: 2.Special: 90 to 100; 3.Very Good: 76 to 89; 4.Average: 56 to 75; 5.Below average: 0 to 55	Lectures, Discussions 3 X 50			0%
10	Able to explain and solve Laplace transformation fractions that have complex roots	Able to explain and solve Laplace transformation fractions that have complex roots	**Criteria:** 1.Value Criteria: 2.Special: 90 to 100; 3.Very Good: 76 to 89; 4.Average: 56 to 75; 5.Below average: 0 to 55	Lectures, Discussions 3 X 50			0%
11	Able to understand and explain the basics of Z Transformation	Able to understand and explain the basics of Z Transformation	**Criteria:** 1.Value Criteria: 2.Special: 90 to 100; 3.Very Good: 76 to 89; 4.Average: 56 to 75; 5.Below average: 0 to 55	Lectures, Discussions 3 X 50			0%
12	Able to understand and explain the properties of the Z Transformation and the rationalization of the Z Transformation	Able to understand and explain the properties of the Z Transformation and the rationalization of the Z Transformation	**Criteria:** 1.Value Criteria: 2.Special: 90 to 100; 3.Very Good: 76 to 89; 4.Average: 56 to 75; 5.Below average: 0 to 55	Lectures, Discussions 3 X 50			0%
13	Able to understand and explain the basics of Fourier Transformation	Able to understand and explain the basics of Fourier Transformation	**Criteria:** 1.Value Criteria: 2.Special: 90 to 100; 3.Very Good: 76 to 89; 4.Average: 56 to 75; 5.Below average: 0 to 55	Lectures, Discussions 3 X 50			0%
14	Able to understand and explain the properties of the Fourier Transform and discuss several Fourier Transform questions	Able to understand and explain the properties of the Fourier Transform and discuss several Fourier Transform questions	**Criteria:** 1.Value Criteria: 2.Special: 90 to 100; 3.Very Good: 76 to 89; 4.Average: 56 to 75; 5.Below average: 0 to 55	Lectures, Discussions 3 X 50			0%

15	able to describe filters in control signal processing such as Kalman filters, Wiener filters, and others.	able to describe filters in control signal processing such as Kalman filters, Wiener filters, and others.	**Criteria:** 1. Value Criteria: 2. Special: 90 to 100; 3. Very Good: 76 to 89; 4. Average: 56 to 75; 5. Below average: 0 to 55	Lectures, Discussions 3 X 50			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.