	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
Digital Image Processing	2020103115		T=3	P=0	ECTS=4.77	4	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	Explanation of the concepts of Digital Image Processing, Image Representation, Morphology Process, Preprocessing, Normalization Process, Image Restoration, Enhancement Process, Segmentation Process, Feature Extraction, Recognition Process, and Evaluation stages on images, as well as being able to create a simple program to solve a problem in the image field processing.
References	**Main :**
	1. 1. Rafel C. Gonzalez, Digital Image Processing, 3rd Ed., Pearson Education, 2008 2. Rafel C. Gonzalez, Digital Image Processing using Matlab, Pearson Education, 2003. 3. Perry. Adaptive Image Processing. CRC Press LLC, 2002.
	Supporters:
Supporting lecturer	Dr. Lilik Anifah, S.T., M.T. Dr. Lusia Rakhmawati, 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	Understand the concept of Digital Image Processing	- Understanding Digital Image Processing - Explaining continuous signals - Giving examples of continuous signals in a case - Explaining discrete signals - Giving examples of continuous signals in a case	**Criteria:** 1. The assessment criteria are carried out by looking at aspects: 2. 1. Participation: carried out by observing student activities (weight 2) 3. 2. UTS: carried out with an assessment during the middle of the semester (weight 2) 4. 3. UAS: carried out every semester to measure all indicators (weight 3) 5. 4. Task: carried out on each indicator (weight 3) 6. Student Final Grade: 7. Participation Score (2) x Lever Score (3) x UTS Score (2) x UAS Score (3) divided by 10.	Discussion, simulation and reflection 3 X 50			0%
2	- Can convert images into matrix data - Can do Displaying images - Can do Writing images - Understand Image types - Can do Converting between classes	Create a simple program and present it	**Criteria:** sda	Presentation, discussion, simulation and reflection 3 X 50			0%
3	Understanding image preprocessing	- Create a simple program Color Image Representation - Create a simple program Converting Between Color Spaces - Create a simple program Edge detection	**Criteria:** sda	Presentation, group discussion and reflection 3 X 50			0%
4	Can create programming designs with Morphological Operations	- Creating a simple program Image dilation - Creating a simple program Image erosion - Creating a simple program Opening - Creating a simple program Closing - Creating a simple program Hit-or-miss Transformation - Understanding Labeling - Understanding Morphological Reconstractio - Understanding Gray-scale Morphology	**Criteria:** sda	Project based learning 9 X 50			0%

5	Can create programming designs with Morphological Operations	- Creating a simple program Image dilation - Creating a simple program Image erosion - Creating a simple program Opening - Creating a simple program Closing - Creating a simple program Hit-or-miss Transformation - Understanding Labeling - Understanding Morphological Reconstractio - Understanding Gray-scale Morphology	**Criteria:** sda	Project based learning 9 X 50			0%
6	Can create programming designs with Morphological Operations	- Creating a simple program Image dilation - Creating a simple program Image erosion - Creating a simple program Opening - Creating a simple program Closing - Creating a simple program Hit-or-miss Transformation - Understanding Labeling - Understanding Morphological Reconstractio - Understanding Gray-scale Morphology	**Criteria:** sda	Project based learning 9 X 50			0%
7	Can apply the Normalization Process	- Understanding the Normalization Process - Applying the Intensity Normalization process - Applying the Dimension Normalization process	**Criteria:** sda	Presentation, discussion, simulation and reflection 3 X 50			0%
8	UTS			3 X 50			0%
9							0%
10							0%
11							0%
12							0%
13							0%
14							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.