



Universitas Negeri Surabaya
Faculty of Engineering,
Undergraduate Study Program in Informatics Engineering

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight	SEMESTER	Compilation Date																																																																		
Digital Image Processing	5520203070	Compulsory Study Program Subjects	T=3 P=0 ECTS=4.77	4	July 17, 2024																																																																		
AUTHORIZATION	SP Developer		Course Cluster Coordinator	Study Program Coordinator																																																																			
	Aditya Prapanca, S.T., M.Kom.																																																																			
Learning model	Project Based Learning																																																																						
Program Learning Outcomes (PLO)	PLO study program that is charged to the course																																																																						
	PLO-1	Able to analyze complex computing problems to identify technology project management solutions in the field of informatics/computer science by considering insights into the development of transdisciplinary science (KNO-01)																																																																					
	PLO-4	Have the ability to work in a team (SKI-01)																																																																					
	Program Objectives (PO)																																																																						
	PO - 1	Students know and are able to explain 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, and can create simple programs to solve a problem in the field of image processing.																																																																					
	PO - 2	Students have a responsible attitude in developing their knowledge about digital image processing and applying it in everyday life.																																																																					
	PLO-PO Matrix																																																																						
		<table border="1" style="margin: auto;"> <tr> <td>P.O</td> <td>PLO-1</td> <td>PLO-4</td> </tr> <tr> <td>PO-1</td> <td></td> <td></td> </tr> <tr> <td>PO-2</td> <td></td> <td></td> </tr> </table>				P.O	PLO-1	PLO-4	PO-1			PO-2																																																											
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	PO-1																																																																						
PO-2																																																																							
PO Matrix at the end of each learning stage (Sub-PO)																																																																							
	<table border="1" style="margin: auto;"> <tr> <td rowspan="2">P.O</td> <td colspan="16">Week</td> </tr> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td> </tr> <tr> <td>PO-1</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>PO-2</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>				P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	PO-1																	PO-2																
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PO-2																																																																							
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. Rafel C. Gonzalez, Digital Image Processing, 3rd Ed., Pearson Education, 2008. 2. Rafel C. Gonzalez, Digital Image Processing using Matlab, Pearson Education, 2003. 3. Pery. Adaptive Image Processing. CRC Press LLC, 2002.																																																																						
	Supporters:																																																																						
Supporting lecturer	Dr. Ricky Eka Putra, S.Kom., M.Kom. Ervin Yohannes, S.Kom., M.Kom., M.Sc., Ph.D.																																																																						
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	Understanding 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	Form of Assessment : Participatory Activities	Discussion, simulation and reflection 3 X 50			0%
2	Can do Image Representation	- Can convert images into matrix data - Can do Displaying images - Can do Writing images - Understand Image types - Can do Converting between classes	Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	Presentation, Discussion, 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	Form of Assessment : Participatory Activities, Practice/Performance	Presentation, group discussion and reflection 3 X 50			25%
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 Reconstructio - Understanding Gray-scale Morphology	Form of Assessment : Participatory Activities	Presentations, group discussions, simulations and reflections 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 Reconstructio - Understanding Gray-scale Morphology	Form of Assessment : Participatory Activities	Presentations, group discussions, simulations and reflections 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 Reconstructio - Understanding Gray-scale Morphology	Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment, Practices / Performance	Presentations, group discussions, simulations and reflections 9 X 50			0%
7	Can apply the Normalization Process	- Understanding the Normalization Process - Applying the Intensity Normalization process - Applying the Dimension Normalization process	Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	Presentation, discussion, simulation and reflection 3 X 50			0%
8	U.S.S		Form of Assessment : Test	3 X 50			0%
9	Can apply Image Restoration and Reconstruction	- Understanding the Model of the Image Degradation/Restoration Process - Understanding Noise Models - Understanding Spatial Filtering - Understanding Direct Inverse Understanding Wiener Filtering	Form of Assessment : Participatory Activities	Presentation, discussion, simulation and reflection 3 X 50			0%

10	Can apply Image Segmentation	- Understanding segmentation based Point, Line, and Edge Detection - Understanding Thresholding - Understanding Region-Based Segmentation Understanding Segmentation Using the Watershed	Form of Assessment : Participatory Activities	Presentation, discussion, simulation and reflection 3 X 50			0%
11	Can apply Image Segmentation	- Understanding segmentation based Point, Line, and Edge Detection - Understanding Thresholding - Understanding Region-Based Segmentation Understanding Segmentation Using the Watershed	Form of Assessment : Participatory Activities	Presentation, discussion, simulation and reflection 3 X 50			25%
12	Can apply Image Segmentation	- Understanding segmentation based Point, Line, and Edge Detection - Understanding Thresholding - Understanding Region-Based Segmentation Understanding Segmentation Using the Watershed	Form of Assessment : Participatory Activities	Presentation, discussion, simulation and reflection 3 X 50			0%
13	Students are able to carry out Feature Extraction	- Can perform template-based Feature Extraction - Can perform texture-based Feature Extraction	Form of Assessment : Project Results Assessment / Product Assessment	9 X 50 simulation and reflection			0%
14	Students are able to carry out Feature Extraction	- Can perform template-based Feature Extraction - Can perform texture-based Feature Extraction	Form of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	9 X 50 simulation and reflection			50%
15	Students are able to carry out Feature Extraction	- Can perform template-based Feature Extraction - Can perform texture-based Feature Extraction	Form of Assessment : Project Results Assessment / Product Assessment	9 X 50 simulation and reflection			0%
16			Form of Assessment : Test				0%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	62.5%
2.	Project Results Assessment / Product Assessment	25%
3.	Practice / Performance	12.5%
		100%

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.

