	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
Computer Vision	5520203102		T=3	P=0	ECTS=4.77	6	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**
	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 studies how computers can understand and interpret the content contained in images and teaches the basic concepts of various computer vision techniques and their applications in the image pattern recognition process.
References	**Main :**

1. Linda Shapiro and George Stockman. 2000. Computer Vision. The University of Washington Seattle, Washington.
2. Bernd Jahne, Horst Haubecker. 2000. Computer Vision and Applications A Guide for Students and Practitioners. Academic Press..
3. David A. Forsyth, Jean Ponce. 2002. Computer Vision : A Modern Approach. Prantice Hall
4. Richard Szeliski. 2011 Computer Vision : Algorithms & Applications. Springer.

Supporters:

Supporting lecturer	Naim Rochmawati, S.Kom., M.T. Dr. Ricky Eka Putra, S.Kom., M.Kom.

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	Introduction to computer vision	1. Explain about computer vision 2. Identify various examples of computer vision 3. Understand the benefits of computer vision	**Criteria:** 1. True = 1 2. False = 0 **Form of Assessment** : Participatory Activities	Approach: Scientific Method: Discussion, Question and Answer Model: Cooperative 3 X 50			25%
2	Implement filtering and edge detection	1. Explain the filtering function with image convolution 2. Implementing filtering with image convolution 3. Explain edge detection 4. implement edge detection	**Criteria:** 1. True = 1 2. False = 0	Approach: Scientific Method: Discussion, assignment Model: Cooperative 3 X 50			0%
3	Edge operators and Image Segmentation	1. Explain the function of the edge operator 2. Implement edge operators with gaussian kernels 3. explain image segmentation 4. Implement image segmentation	**Criteria:** 1. True = 1 2. False = 0 **Form of Assessment** : Participatory Activities	Approach: Scientific Method: Discussion, assignment Model: Cooperative 3 X 50			25%
4	Image Motion	1. Explain about image motion 2. Understand the function of image motion 3. Implement image motion	**Criteria:** 1. True = 1 2. False = 0	Approach: Scientific Method: Discussion, assignment Model: Cooperative 3 X 50			0%
5	Image/Video Tracking	1. Explains image / video tracking 2. Understand the function of image / video tracking 3. Implement image/video tracking	**Criteria:** 1. True = 1 2. False = 0	Approach: Scientific Method: Discussion, assignment Model: Cooperative 3 X 50			0%
6	Image Geometry	1. Explain about image geometry 2. understand the function of image geometry 3. Implementation of image geometry with image formation 4. Implementation of image geometry with 3D Rigid Transformation	**Criteria:** 1. True = 1 2. False = 0	Approach: Scientific Method: Discussion, assignment Model: Cooperative 3 X 50			0%

7	Camera Calibration	1. Explains camera calibration 2. Understand the functions and benefits of camera calibration 3. Implement camera calibration	**Criteria:** 1. True = 1 2. False = 0	Approach: Scientific Method: Discussion, assignment Model: Cooperative 3 X 50			0%
8	Midterm Evaluation / Midterm Exam						0%
9	[C2, P1, A2] Students understand and are able to perform basic stereopsis techniques that can be used in computer vision	Accuracy in explaining the basic principles of stereopsis and simulating them	**Criteria:** Written and simulated **Form of Assessment** : Portfolio Assessment, Practical Assessment	Lectures & Presentations			10%
10	[C2, P1, A2] Students understand and are able to perform basic stereopsis techniques that can be used in computer vision	Accuracy in explaining the basic principles of stereopsis and simulating them	**Criteria:** Written and simulated **Form of Assessment** : Portfolio Assessment, Practical Assessment	Lectures & Presentations			10%
11	Students understand the basic principles of motion in images and videos and know motion detection algorithms in video data	Accuracy in explaining the basic principles of motion detection along with the basic algorithm	**Criteria:** Written and simulated (Assignments) **Form of Assessment** : Practical Assessment	Lectures & Presentations			10%
12	Students understand and are able to perform basic object tracking techniques that can be used in computer vision	Accuracy in explaining the basic principles of object tracking along with the basic algorithm	**Criteria:** Written and simulated (Assignments)	Lectures & Presentations			20%
13	Students understand and are able to perform basic object tracking techniques that can be used in computer vision	Accuracy in explaining the basic principles of object tracking along with the basic algorithm	**Criteria:** Written and simulated (Assignments) **Form of Assessment** : Portfolio Assessment, Practical Assessment	Lectures & Presentations			20%
14	Students are able to apply the techniques they have learned to various computer vision applications/systems	Accuracy in applying various techniques that have been learned into the computer vision system	**Criteria:** Written and simulation (Assignments and Quiz) Presentation **Form of Assessment** : Participatory Activities, Portfolio Assessment	Review papers, lectures & discussions			30%
15	Students are able to apply the techniques they have learned to various computer vision applications/systems	Accuracy in applying various techniques that have been learned into the computer vision system	**Criteria:** Written and simulation (Assignments and Quiz) Presentation **Form of Assessment** : Participatory Activities, Portfolio Assessment	Review papers, lectures & discussions			30%
16	Final Semester Evaluation / Final Semester Examination						0%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	80%
2.	Portfolio Assessment	50%
3.	Practical Assessment	30%
		100%

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** 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.
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.