	Universitas Negeri Surabaya Faculty of Engineering , Information Technology Education Undergraduate Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Computer Vision	8320703099		T=3	P=0	ECTS=4.77	5	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	Drs. Bambang Sujatmiko, M.T.

Learning model	**Project Based Learning**	
Program Learning Outcomes (PLO)	**PLO study program which is charged to the course**	
	PLO-8	Mastering the concepts and implementation in developing software engineering, games, intelligent multimedia, and network computer engineering.
	PLO-13	Able to develop innovative educational products or learning resources using scientific design-based strategies to support teaching activities that can be integrated with ICT.
	Program Objectives (PO)	
	PLO-PO Matrix	

P.O	PLO-8	PLO-13

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	Computer vision courses are courses that teach students the computer process of simulating human vision, as well as how to utilize the results of these simulations.	
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	Setya Chendra Wibawa, S.Pd., M.T. I Gusti Lanang Putra Eka Prismana, S.Kom., M.Kom. Bonda Sisephaputra, M. Kom. Martini Dwi Endah Susanti, 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	Approach: Scientific Method: Discussion, Question and Answer Model: Cooperative 3 X 50			0%
2	Projective Geometry and Cameras	1. Explain projective geometry 2. Describe the camera model 3. Analyzing projective geometry and cameras	**Criteria:** 1. True = 1 2. False = 0	Approach: Scientific Method: Discussion, assignment Model: Cooperative 3 X 50			0%
3	Light and color	1. Explain wavelength color 2. Explain grassman laws 3. Explaining RGB 4. Explaining HSV 5. Explaining Black and White 6. Analyze examples of light and color	**Criteria:** True = 1 False = 0	1. Scientific approach 2. Method: Discussion, assignment 3. Model: Cooperative 3 X 50			0%
4	Image Acquisition	1. Explain image acquisition 2. Understanding sensors in image acquisition 3. Analyze the sensors used in image acquisition	**Criteria:** True = 1 False = 0	1. Scientific approach 2. Method: Discussion, assignment 3. Model: Cooperative 3 X 50			0%
5	Color histogram and equalization	1. Displays a histogram for one greyscale channel and each color channel 2. Perform enhancement using histogram equalization 3. Analyze images using histograms	**Criteria:** 1. True = 1 2. False = 0	Approach: Scientific Method: Discussion, assignment Model: Cooperative 3 X 50			0%
6	Shape Feature Extraction	1. Analyzing shape feature extraction 2. Enables edge detection for shape feature extraction 3. Using projection histograms for shape feature extraction 4. Using corner histograms for shape feature extraction	**Criteria:** True = 1 False = 0	1. Scientific approach 2. Method: Discussion, assignment 3. Model: Cooperative 3 X 50			0%

7	Hough Alignment Fitting and Transformation	1. Explain and understand the Hough Alignment transformation theory 2. Explain and understand examples of Hough Alignment transformations 3. Explain and understand the advantages and disadvantages of the Hough Alignment transformation	**Criteria:** True = 1 False = 0	1. 2. 3. Scientific approach Method: Discussion, assignment Model: Cooperative 3 X 50			0%
8	UTS			3 X 50			0%
9	Camera Calibration	1.Explain and understand the concept of camera calibration 2.Explain and understand single-view modeling 3.Explain and understand epipolar geometry 4.Explain and understand binoculars and multi-vew stereo 5.Explain and understand structure from motion	**Criteria:** 1.True = 1 2.False = 0	Approach: Scientific Method: Discussion, presentation Model: Cooperative 3 X 50			0%
10	Recognition and Machine Learning	1.Explain and understand recognition theory 2.Explain and understand machine learning theory 3.Explain and understand the recognition process 4.Explain and understand the machine learning process 5.Analyzing examples of recognition and machine learning	**Criteria:** 1.True = 1 2.False = 0	Approach: Scientific Method: Discussion, presentation Model: Cooperative 3 X 50			0%
11	Face Detection	1.Explain and understand the concept of face detection 2.Explain and understand the face detection process 3.Analyzing the face detection process	**Criteria:** 1.true = 1 2.false = 0	Approach: Scientific Method: Discussion, presentation Model: Cooperative 3 X 50			0%

12	Deep Learning	1.Explain and understand the concept of deep learning 2.Explain and understand examples of deep learning 3.Analyzing examples of deep learning	**Criteria:** 1.True = 1 2.False =0	Approach: Scientific Method: Discussion, presentation Model: Cooperative 3 X 50			0%
13	Extended Kalman Filter	1.Explain and understand the concept of the extended Kalman filter 2.Explain and understand examples of extended Kalman filters 3.Analyzing examples of extended Kalman filters	**Criteria:** 1.true = 1 2.false = 0	Approach: Scientific Method: Discussion, presentation Model: Cooperative 3 X 50			0%
14	Augmented Reality	1.Explain and understand the development of Augmented Reality 2.Explain and understand the concept of Augmented Reality 3.Explain and understand examples of Augmented Reality 4.Explain and understand the implementation of Augmented Reality	**Criteria:** 1.true = 1 2.false = 0	Approach: Scientific Method: Discussion, presentation Model: Cooperative 3 X 50			0%
15	3D Objects	1. Explain and understand the concept of 3D Objects 2. Explain and understand 3D Object types 3. Explain and understand the structure of creating 3D objects	**Criteria:** true = 1 false = 0	1. Scientific approach 2. Method: Discussion, presentation 3. Model: Cooperative 3 X 50			0%
16	UAS			3 X 50			0%

Evaluation Percentage Recap: Project Based Learning

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** 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.