

AM3209PE: COMPUTER VISION

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(PROFESSIONAL ELECTIVE –III)

III-II:CSE(AI&ML)								
Course Code	Category	Hours/Weak			Credits	Max Marks		
AM3209PE	Core	L	T	P	C	CIE	SEE	Total
		3	0	0	3	25	75	100
Contact Classes:45	Tutorial classes:15	Practical classes: Nill			Total Classes:60			
Prerequisites:								

**Course Objectives**

- To study the development of algorithms and techniques to analyze and interpret the visible world around us.
- Be familiar with both the theoretical and practical aspects of computing with images.
- To understand the basic concepts of Computer Vision.
- Understand the geometric relationships between 2D images and the 3D world.

**Course Outcomes**

- Understand the fundamental problems of computer vision.
- Implement various techniques and algorithms used in computer vision.
- Analyze and evaluate critically the building and integration of computer vision algorithms.
- Demonstrate awareness of the current key research issues in computer vision.

**UNIT – I**

Overview, computer imaging systems, lenses, Image formation and sensing, Image analysis, pre-processing and binary image analysis.

**UNIT – II**

Edge detection, Edge detection performance, Hough transform, corner detection.

**UNIT – III**

Segmentation, Morphological filtering, Fourier transform.

**UNIT – IV**

Feature extraction, shape, histogram, color, spectral, texture, using CVIP tools, Feature analysis, feature vectors, distance /similarity measures, data pre- processing.

**UNIT – V**

Dimensionality Reduction: PCA, LDA, ICA, and Non-parametric methods.

**Books and References**

1. Computer Vision: Algorithms and Applications by Richard Szeliski.
2. Deep Learning, by Goodfellow, Bengio, and Courville.
3. Dictionary of Computer Vision and Image Processing, by Fisher et al.