

Module No.	Unit No.	Topics	Hrs.
1	DIGITAL IMAGE FUNDAMENTALS AND POINT PROCESSING		04
	1.1	Introduction –Steps in Digital Image Processing, concept of spatial and intensity resolution, Relationships between pixels	02
	1.2	Point Processing : Image Negative, Log Transform, Power Law transform, Bit plane slicing, Contrast stretching , Histogram equalization and Histogram Specification	02
2	IMAGE ENHANCEMENT		08
	2.1	Spatial Domain filtering : The Mechanics of Spatial Filtering, Smoothing Spatial Filters -Linear Filters-Averaging filter, Order-Statistic Filters- Median filter, Application of Median filtering for Noise removal Sharpening Spatial Filters - The Laplacian, Unsharp Masking and Highboost Filtering, Using First-Order Derivatives —The Gradient- Sobel, Prewitt and Roberts	03
	2.2	Frequency Domain Filtering: Introduction to 2-D DFT and its application in frequency domain filtering, Wavelet transform, Haar transform	02
	2.3	Frequency Domain Filtering Fundamentals , Fourier Spectrum and Phase angle ,Steps for Filtering in the Frequency Domain, Correspondence Between Filtering in the Spatial and Frequency Domains, Frequency domain Image Smoothing and sharpening filter - Ideal, Butterworth , Gaussian	03
3	IMAGE MORPHOLOGY AND RESTORATION		06
	3.1	Morphology: Erosion and Dilation, Opening and Closing, The Hit-or-Miss Transformation, Boundary extraction , Hole filling, Thinning and thickening	04
	3.2	Restoration : A Model of the Image Degradation/Restoration Process, Noise models, Removal periodic noise, Principle of Inverse filtering	02
4	IMAGE SEGMENTATION		08
	4.1	Point, Line, and Edge Detection: Detection of Isolated Points, Line detection, edge models, Canny's edge detection algorithm , Edge linking : Local processing and boundary detection using regional processing (polygonal fitting)	05
	4.2	Thresholding : Foundation, Role of illumination and reflectance, Basic global thresholding	01
	4.3	Region Based segmentation: Region Growing, Region Splitting and merging	02
5	INTRODUCTION TO MACHINE VISION AND DESCRIPTORS		05
	5.1	Principle of machine vision , real world applications, chain code, simple geometric border representation, Fourier Transform of boundaries, Boundary description using segment sequences	03
	5.2	Introduction to Texture, co-occurrence matrix	02
6	MACHINE VISION ALGORITHMS		08
	6.1	Knowledge representation, Classification Principles, Classifier setting, Classifier Learning, Confusion Matrix	02
	6.2	K-means clustering algorithm, Introduction, bays decision theory continuous case, two category classification, Bayesian classifier ,Support vector machine	06
TOTAL			39