IV YEAR SEM-I B.Tech CSE	ELECTIVE	L	T	P	C
CODE: CS4502	**Digital Image Processing**	2	2	0	4

Unit I (Introduction)

Examples of fields that use digital image processing, fundamental steps in digital image processing, components of image processing system. Digital Image Fundamentals: A simple image formation model, image sampling and quantization, basic relationships between pixels.

Unit II (Image enhancements and Filtering)

Image enhancements in the spatial domain: Basic gray-level transformation, histogram processing, enhancement using arithmetic and logic operators, basic spatial filtering, smoothing and sharpening spatial filters, combining the spatial enhancement methods.

Unit II (Image restoration)

A model of the image degradation/restoration process, noise models, restoration in the presence of noise–only spatial filtering, Weiner filtering, constrained least squares filtering, geometric transforms; Introduction to the Fourier transform and the frequency domain, estimating the degradation function.

Unit IV (Color Image Processing and Compression)

Color Image Processing: Color fundamentals, color models, pseudo color image processing, basics of full–color image processing, color transforms, smoothing and sharpening, color segmentation. Image Compression: Fundamentals, image compression models, error-free compression,lossypredictive coding, image compression standards

Unit V (Morphological Image Processing and Segmentation)

Preliminaries, dilation, erosion, open and closing hit or miss transformation, basic morphologic algorithms. Image Segmentation: Detection of discontinuous, edge linking and boundary detection, thresholding, region–based segmentation.

Unit VI (Object Recognition)

Object Recognition : Patterns and patterns classes, recognition based on decision–theoretic methods, matching, optimum statistical classifiers, neural networks, structural methods – matching shape numbers, string matching.

Text Books:

1. Digital Image Processing, RafealC.Gonzalez, Richard E.Woods, Second Edition, Pearson Education/PHI.
2. Introduction to Digital Image Processing with Matlab, Alasdair McAndrew, Thomson Course Technology.

Reference Books:

1. Digital Image Processing using Matlab, RafealC.Gonzalez, Richard E.Woods, Steven L. Eddins, Pearson Education.
2. Image Processing, Analysis, and Machine Vision, Milan Sonka, Vaclav Hlavac and Roger Boyle, Second Edition, Thomson Learning.
3. Computer Vision and Image Processing, Adrian Low, Second Edition, B.S.Publications.
4. Digital Image Processing and Analysis, B. Chanda, D. DattaMajumder, Prentice Hall of India, 2003.

Video Reference:

Title	Expert Name	Affiliation	Weblink
Digital Image Processing (CSE)	Prof. G. Harit	IIT Kharagpur	**http://nptel.ac.in/courses/106105032/1**
Digital Image Processing (ECE)	Prof .P. K. Biswas	IIT Kharagpur	**http://nptel.ac.in/courses/117105079/**