Course Number and Name

BEC007 - DIGITAL IMAGE PROCESSING

Credits and Contact Hours

3 and 45

Course Coordinator's Name

Dr B.Karthik

Text Books and References

TEXT BOOK:

1.Rafael C. Gonzales, Richard E. Woods, "Digital Image Processing", Third Edition, Pearson Education, 2010

REFERENCES:

1.Rafael C. Gonzalez, Richard E. Woods, Steven L. Eddins, "Digital Image Processing Using MATLAB", Third Edition Tata Mc Graw Hill Pvt. Ltd., 2011.

2. Anil Jain K. "Fundamentals of Digital Image Processing", PHI Learning Pvt. Ltd., 2011.

3.Willliam K Pratt, "Digital Image Processing", John Willey, 2002.

4.Malay K. Pakhira, "Digital Image Processing and Pattern Recognition", First Edition, PHI Learning Pvt. Ltd., 2

5. www.tutorialspoint.com/dip/

Course Description

- To study the image fundamentals and mathematical transforms necessary for image processing.
- To study the image enhancement techniques
- To study image restoration procedures.
- To study the image compression procedures.

Prerequisites	Co-requisites
Digital Signal Processing	Nil

required, elective, or selected elective (as per Table 5-1)

Selected Elective

Course Outcomes (COs)

CO1: Review the fundamental concepts of a digital image processing system.

CO2 : Analyze images in the frequency domain using various transforms.

CO3 : Evaluate the techniques for image enhancement and image restoration.

CO4 : Categorize various compression techniques.

CO5: Interpret Image compression standards.

CO6 : Interpret image segmentation and representation techniques.

Student Outcomes (SOs) from Criterion 3 covered by this Course

COs/SOs	a	b	c	d	e	f	g	h	i	j	k
CO1	H					M		H			
CO2	M	M	H				H		L		
CO3	M	H	M				M	M	M		H
CO4	M	H			M				M	H	M
CO5		M			M	M	M		L		M
CO6				M	M	H	M				

List of Topics Covered

UNIT I DIGITAL IMAGE FUNDAMENTAL **9**

Elements of digital image processing systems, Elements of Visual perception, Image sampling and quantization, Matrix and Singular Value representation of discrete images.

UNIT II IMAGE TRANSFORMS **9**

1D DFT, 2D DFT, Cosine, Sine Hadamard, Hear, Slant, KL, SVD transform and their properties.

UNIT III IMAGE ENHANCEMENT **9**

Histogram – Modification and specification techniques Image smoothing, Image sharpening, generation of spatial masks from frequency domain specification, Nonlinear filters, Homomorphism filtering, false color, Pseudo color and color image processing.

UNIT IV IMAGE RESTORATION AND RECOGNITION **9**

Image DEGRADATION models, Unconstrained and Constrained restoration, inverse filtering, Least mean square filter, Pattern Classes, optimal statistical classifiers, Neural networks and associated training methods and use of neural networks in image processing.

UNIT V IMAGE COMPRESSION **9**

Run length, Huffman coding, Shift codes, arithmetic coding, bit plane coding, transform coding, JPEG Standard, wavelet transform, predictive techniques, Block truncation coding schemes, Facet modeling.