GAUHATI UNIVERSITY
GUWAHATI

LESSON PLAN

Subject : **Digital Image Processing** **L-T-P-C=4-1-1-6**
Subject Code : **CS/IT 3056**
Semester : **3rd** **Theory = 100 marks.**
Department : Computer Science
Lecturer : Dr. Sanjib Kr Kalita

MODULE. NO.	TOPIC	COURSE CONTENT	NO. OF SLOTS	REMARKS
1	**Digital image processing systems**	Light, Brightness adaption and discrimination, Pixels, coordinate conventions	1	
		Image acquisition, storage, processing, communication, display.	1	
		Total slots	**2**	
2	**Visual Perception, Image Model**	Structure of the human eye	1	Assignment-1 Class Test -1 **Quiz 1**
		image formation in the human eye,	1	
		brightness, adaptation and discrimination.	1	
		Uniform and non-uniform sampling	1	
		quantization	1	
		Gradient and Laplacian	1	
		Total slots	**6**	
3	**Image Transforms**	Introduction to Fourier transform	1	Assignment 2 Class Test 2
		DFT and two dimensional DFT, some properties of DFT, separability, translation, periodicity, conjugate symmetry, rotation, scaling, average value, convolution theorem, correlation,	2	
		FFT algorithms, inverse FFT	1	
		filter implementation through FFT	1	
		Other transforms: Other separable image transforms and their algorithms.	1	
		Total slots	**7**	
4	**Image**	Image enhancement in spatial domain	3	

	Enhancement	and frequency domain		
		Histogram processing.	1	
		Spatial Filtering	1	
		Frequency Domain Filtering	1	
Total slots			**6**	
5	**Image Restoration**	Restoration/Degradation Model	2	
		Inverse Filtering	1	
		Wiener Filtering	1	
Total slots			**4**	
6	**Edge Detection and Segmentation**	Introduction,	1	
		Similarity based segmentation	2	Assignment 3
		Dissimilarity based segmentation	2	
		Texture Analysis and Classification	2	Class Test 3 Quiz 2
Total slots			**7**	
7	**Binary Image Processing**	Introduction	1	
		Morphological Image Processing,	3	
		Distance Transform	1	
Total slots			**5**	Assignment 4
8	**Color Image Processing**	Introduction	1	
		Color model	2	Class Test 4, Quiz 3
		Histogram of a colour image	1	
Total slots			4	
9	**Image Compression**	Lossy Compression	1	Assignment 5
		Loss-less compression	1	
		Run-length and Huffman Coding	1	
		Transform Coding	1	
		Image Compression Standards	1	
Total slots			**5**	

Assignments and Class test:

Students are to submit at least three assignments and to appear three class tests.

TEXT BOOKS/REFERENCES :

1. R. C. Gonzalez & R. E. Woods - Digital Image Processing, Addison Wesley, 1993.
2. A. K. Jain - Fundamentals of Digital Image Processing, PHI
3. K. R. Castleman - Digital Image Processing, PHI 1996
4. W. K. Pratt - Digital Image Processing, John Wiley Interscience, 1991
5. NPTEL, IIT Kharagpur

Signature