

# Bhoj Reddy Engineering College for Women: Hyderabad

## Department of Electronics and Communication Engineering

Lesson plan of faculty member for the academic year 2017–18

Class: IV B Tech

Branch-Section: ECE-B

Semester: I

Subject: Digital Image Processing (A70436) (ELECTIVE - I) Lectures per week: 4+1 (Tutorial)

Lecture Number	Topics to be covered	Date(s)
<b>Unit-1: Digital Image fundamentals &amp; Image Transforms:</b>		
1.	Digital Image fundamentals	12 July 2017
2.	Sampling and quantization	13 July 2017
3.	Relationship between pixels	15 July 2017
4.	Tutorial( G2):Operations on pixels	14 July 2017
5.	Image Transforms: 2-D FFT	18 July 2017
6.	Properties of Fourier transform	19 July 2017
7.	Walsh transform	20 July 2017
8.	Discrete cosine Transform	22 July 2017
9.	Tutorial(G3, G2):Hadamard Transform	18,21 July 2017
10.	Haar transform	25 July 2017
11.	Slant transform	26 July 2017
12.	Hotelling transform	27 July 2017
13.	Properties of transforms	29 July 2017
14.	Tutorial(G1, G3, G2):Problem solving	24,25,28 July 2017
<b>Unit-2 :Image Enhancement (Spatial Domain):</b>		
15.	Introduction, Image Enhancement in spatial domain	1 August 2017
16.	Enhancement through point operation, Types of Point Operation	2 August 2017
17.	Enhancement through point processing	3 August 2017
18.	Histogram Processing	5 August 2017
19.	Tutorial(G1, G3, G2):Histogram Manipulation	31 July, 1,4 August 2017
20.	Histogram Equalization	8 August 2017
21.	Histogram specification	9 August 2017
22.	Gray level transformation	10 August 2017
23.	Linear & Non - linear gray level transformation	12 August 2017
24.	Tutorial(G1, G3, G2): Gray level transformation	7,8,11 August 2017
25.	Local or neighborhood operation	16 August 2017
26.	Median filter	17 August 2017
27.	Spatial domain high pass filtering	19 August 2017
28.	Tutorial(G2): Problems	18 August 2017
<b>Image Enhancement (Frequency Domain):</b>		
29.	Filtering in frequency domain	22 August 2017
30.	obtaining frequency domain filters from spatial filters	23 August 2017
31.	Generating filters directly in the frequency domain	24 August 2017
32.	Low pass (smoothing) filters and High pass (sharpening) filters in frequency domain	26 August 2017
33.	Tutorial(G1, G3): Problems	21,22 August 2017
<b>Unit-3: Image Restoration:</b>		
34.	Degradation model	29 August 2017
35.	Algebraic approach to restoration	30 August 2017
36.	Inverse filtering, Least mean square filters	31 August 2017

37.	Tutorial(G1, G3, G2) : Least mean square filters	28,29 August, 1 September 2017
38.	Constrained Least Squares Restoration	5 September 2017
39.	Interactive Restoration	9 September 2017
40.	Tutorial(G1, G3):Revision	4,5 September 2017
<b>Unit-4: Image segmentation:</b>		
41.	Detection of discontinuities	12 September 2017
42.	Edge linking	13 September 2017
43.	Boundary detection	14 September 2017
44.	Boundary detection	16 September 2017
45.	Tutorial(G1, G3, G2): Edge linking	11,12,15 September 2017
46.	Thresholding	19 September 2017
47.	Region oriented segmentation	21 September 2017
48.	Region oriented segmentation	23 September 2017
49.	Tutorial(G1, G3, G2): Thresholding	18,19,22 September 2017
<b>Morphological Image Processing</b>		
50.	Dilation and Erosion	3 October 2017
51.	Structuring Element Decomposition	4 October 2017
52.	Erosion	5 October 2017
53.	Opening and Closing	7 October 2017
54.	Tutorial(G3, G2): Dilation and Erosion	3,6 October 2017
55.	The Strel function	10 October 2017
56.	Combining Dilation and Erosion	11 October 2017
57.	Hit or miss transformation	12 October 2017
58.	Revision	14 October 2017
59.	Tutorial(G1, G3, G2): The Strel function	9,10,13 October 2017
<b>Unit-5: Image Compression:</b>		
60.	Redundancies and their removal methods	17 October 2017
61.	Fidelity criteria	19 October 2017
62.	Image compression models	21 October 2017
63.	Tutorial(G1, G3, G2) : compression models	16,17,20 October 2017
64.	Huffman and Arithmetic coding	24 October 2017
65.	Error free compression	25 October 2017
66.	Lossy compression	26 October 2017
67.	Lossy and lossless Predictive coding	28 October 2017
68.	Tutorial(G1, G3, G2) : Lossy compression	23,24,27 October 2017
69.	Transform based compression	31 October 2017
70.	JPEG 2000 standards	1 November 2017
71.	Revision	2 November 2017
72.	Tutorial(G1, G3, G2): Revision	30,31 October 3 November 2017
73.	Revision	7 November 2017
74.	Tutorial (G1, G3):Revision	6,7 November 2017

#### Text books:

1. Digital Image Processing – Rafael C. Gonzalez, Richard E. Woods, 3<sup>rd</sup> edition, Pearson, 2008.
2. Digital Image Processing – S Jayaraman, S Esakkirajan, T Veerakumar, TMH, 2010.

#### References:

1. Fundamentals of Digital Image Processing– A.K.Jain, PHI, 1989.

Name and signature of the faculty: Ms G Srilakshmi, ECE ----

Name and signature of Head of the Department: Ms N Shribala ----