Session Plan Theory

BHARATI VIDYAPEETH COLLEGE OF ENGINEERING

Department of Electronics & Telecommunication.

Class T.E.-A	**IMAGE PROCESSING AND MACHINE VISION (ECC604)**	**Sem** : VI

TEACHING PLAN

Lectures per Week: 04 **Subject Incharge : Dr. Swati Jha**

Text Books:

1. Milan Sonka, Vaclav Hlavac, Roger Boyle, —Image Processing, Analysis, and Machine Vision, Cengage Engineering, 3rd Edition, 2013

2. Gonzales and Woods, —Digital Image Processing, Pearson Education, India, Third Edition,

Reference books:

1. Anil K.Jain, —Fundamentals of Image Processing, Prentice Hall of India, First Edition, 1989.

2. W Pratt, —Digital Image Processing, Wiley Publication, 3rd Edition, 2002

Lecture No.	Module No.	Planned Date	Broad topics to be covered	Detail Theory to be covered	Suggested Books (Page Nos.)
L1	**1.1**	**01/01/2020**	**Digital Image Fundamental**	Introduction & Origin Steps in Image processing basics, Elements of Visual Perception	T1- Ch 1 (27-35) T2-ch1 (10-21) R1- ch1(1-9)
L2	**1.1**	**02/01/2020**		Image sensing and acquisition, Image Sampling and quantization	T2-ch2 (31-40) R1- ch4(80-99)
L3	**1.1**	**06/01/2020**		Relationship between pixels, Transformation: Orthogonal, Euclidean, Affine	T2-ch3 (70-83)
L4	**1.2**	**07/01/2020**		**Color Image Processing**: Color Fundamentals, Color models. RGB, HSI and other models	T2-ch7 (173-184) R1- ch3(73-75)
L5	**2.1**	**08/01/2020**	**Image Transforms**	1-D DFT	T1- c12(602-603) R1- ch5(141-144)
L6	**2.1**	**09/01/2020**		2-D Discrete Fourier Transform and Its Inverse	T1- c12(603-604) R1- ch5(145-147)
L7	**2.1**	**13/01/2020**		Walsh Transform Hadamard Transform	T1- c12(604-605) R1- ch5(155-157)
L8	**2.1**	**14/01/2020**		Discrete Cosine Transform	T1- c12(605-606) R1- ch5(150-153)

L9	**2.1**	**15/01/2020**	**Image Transforms**	Haar Transform	T1- c12(608-609) R1- ch5(159-161)
L10	**2.1**	**16/01/2020**		Discrete Wavelet Transform	T1- ch12 (606-608)
L11	**3.1**	**20/01/2020**	**Image Enhancement:** **Spatial Domain**	**Point Processing:** Image Negative, Grey level slicing, Bit plane slicing, Log Transform, Power Law transform,	R1- ch7(235-240)
L12	**3.1**	**21/01/2020**		Histogram equalization	R1- ch7(241)
L13	**3.1**	**22/01/2020**		Histogram Specification	R1- ch7(243)
L14	**3.2**	**23/01/2020**		**Spatial Domain:** Basics of Spatial Filtering, The Mechanics of Spatial Filtering	R1- ch7(244) R2- ch6 (206)
L15	**3.2**	**27/01/2020**		Generating Spatial Filter Masks–Smoothing and Sharpening Spatial Filtering	R1- ch7(250) R2- ch6 (206)
L16	**3.3**	**28/01/2020**	**Image Enhancement** **Frequency Domain:**	**Frequency Domain:** The Basics of Filtering in the Frequency Domain	
L17	**3.3**	**29/01/2020**		Smoothing and Sharpening frequency domain filters – Ideal, Butterworth and Gaussian filters,	
L18	**3.3**	**30/01/2020**		Laplacian, Unsharp Masking and Homomorphic filters	R1- ch7(259)

L19	**4.1**	**03/02/2020**	**Morphological & Image Restoration**	**Morphology:** Erosion and Dilation,	R2- ch14 (442-452)
L20	**4.1**	**04/02/2020**		Morphology: Opening and Closing	R2- ch14(453-454)
L21	**4.1**	**05/02/2020**		Morphology: The Hit or-Miss Transformation.	R2- ch14(424-430)
L22	**4.2**	**06/02/2020**		**Restoration:** Noise models – Mean Filters – Order Statistics –.	R2- ch11(307-322)
L23	**4.2**	**10/02/2020**		Restoration: Adaptive filters – Band reject Filters –	T1-ch5 (147)
L24	**4.2**	**11/02/2020**		Restoration: Band pass Filters – Notch Filters	T1-ch5 (145)
L25	**5.1**	**12/02/2020**	**Image Segmentation**	**Point, Line, and Edge Detection:** Detection of Isolated Points, Line detection	T1-ch5 (135) R1- ch9(347-356)
L26	**5.1**	**13/02/2020**		Edge models, basic and advance edge detection	T1-ch5 (134-142)
L27	**5.1**	**02/03/2020**		Edge linking and boundary detection, Canny's edge detection algorithm	R1- ch9(347-356)
L28	**5.2**	**03/03/2020**		**Thresholding :** Foundation, Role of illumination, Basic Global thresholding	T1-ch5 (172-175)
L29	**5.3**	**04/03/2020**		**Region Based segmentation:** Region Growing	T1-ch5 (176, 188)

L30	**5.3**	**05/03/2020**	**Image Segmentation**	Region Splitting and merging	T1-ch5 (177,181)
L31	**5.4**	**09/03/2020**		**Region Identification**: Chain code	T1-ch6 (232-236) R1- ch8(275)
L32	**5.4**	**11/03/2020**		Simple geometric border representation,	T1-ch6 (237-239)
L33	**5.4**	**12/03/2020**		Fourier Transform of boundaries	T1-ch6 (240-241)
L34	**5.4**	**16/03/2020**		Boundary description using segment sequences B-spline representation	T1-ch6 (242-245) R1- ch9(362-364)
L35	**6.1**	**17/03/2020**	**Boundary Description & Object Recognition**	**Texture:** Statistical Texture Description.	T1-ch14(649)
L36	**6.1**	**18/03/2020**		Methods- Methods based on spatial frequencies	T1-ch14(650)
L37	**6.1**	**19/03/2020**		Co-occurrence matrices,	T1-ch14(651)
L38	**6.1**	**23/03/2020**		Edge frequency, Primitive length, Law's texture energy measures	T1-ch14 (653-656)
L39	**6.2**	**24/03/2020**		**Object Recognition** Knowledge representation	T2-ch7 (290-291)
L40	**6.2**	**25/03/2020**			
L41	**6.2**	**26/03/2020**		Classification Principles	T2-ch7 (297)
L42	**6.2**	**30/03/2020**	**Boundary Description & Object Recognition**	Classifier setting	T2-ch7 (298)
L43	**6.2**	**01/04/2020**		Classifier Learning	T2-ch7 (300)
L44	**6.2**	**07/04/2020**		Support vector machine	T2-ch7 (303)
L45	**6.2**	**08/04/2020**		Cluster analysis	T2-ch7 (307)