Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India
(Autonomous Institute Affiliated to University of Mumbai)

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		L	T	P	L	T	P	Total
CEE91B	Image Analysis and Interpretation (IAI)	3	--	--	3	--	--	3
		Examination Scheme						
		ISE		MSE		ESE		
		10		30		100 (60% Weightage)		

Pre-requisite Course Codes		Digital Image Processing
At the end of successful completion of the course, students will be able to		
Course Outcomes	CO1	Understand the importance of Image Analysis and Interpretation.
	CO2	Analyze various techniques of Image Analysis
	CO3	Analyze various transforms.
	CO4	Use the methods of image analysis and interpretation for various Image Processing applications.

Module No.	Unit No.	Topics	Ref.	Hrs.
1		**Introduction to Image processing System**		**04**
	1.1	What is Digital Image Processing? Image types.	**1**	02
	1.2	Examples of Fields that Use Digital Image Processing.		01
	1.3	Light and the electromagnetic spectrum, Image digitization		01
2		**Image Enhancement in Spatial domain**		**08**
	2.1	Gray level transformations: Point Processing	**1,2,3**	03
	2.2	Histogram Equalization		02
	2.3	Neighborhood Processing, Spatial Filtering, Smoothing and Sharpening Filters, Median Filter.		03
3		**Image Analysis**		**08**
	3.1	Data Structure for Image Analysis: Levels of image data representation, Traditional image data structures, Hierarchical data structures	**1,2,3,4,5,7**	03
	3.2	Image Segmentation :Thresholding , Edge based Segmentation		03
	3.3	Region Based Segmentation,		02
4		**Discrete Image Transform**		**09**
	4.1	Need for transform, Introduction to Unitary and Orthogonal Transform,	**2,3,4**	02
	4.2	Discrete Cosine Transform, Singular Value Decomposition, K-L transform, Wavelet Transform.		04
	4.3	The Kronecker Product ,Hadamard Transform, Fast Hadamard Transform, Walsh Transform, Haar Transform		03

5		**Image Feature Extraction**		**09**
	5.1	Spatial Feature Extraction, Transform Feature Extraction	**1,2,4,7**	03
	5.2	Geometry features, Moment based features,		04
	5.3	Texture based features.		02
6		**Applications and Case Study**		**04**
	6.1	Remote Sensing	**1,2,6**	02
	6.2	Medical Imaging		02
			Total	**42**

References:

[1] Rafael C. Gonzalez and Richard E.Woods,Pearson "*Digital Image Processing* " Prentice Hall, 2nd Edition,

[2] Anil K. Jain, "*Fundamentals of Digital Image Processing*", PHI

[3] S Jayaraman, S Esakkirajan, and T Veerakumar "*Digital Image Processing* ", Tata McGraw-HillEducation Private Limited

[4] Milan Sonka, Vaclav Hlavac and Roger Boyle," *Image Processing, Analysis, and Machine Vision* ", Thomson, 2nd Edition.

[5] B. Chandra and D. Dutta Majumder, "*Digital Image Processing and Analysis*", Prentice Hall of India Private Ltd

[6] Robert A. Schowengerdt, "*REMOTE SENSING, Models and Methods for Image Processing",* ELSEVIER, 3rd Edition.

[7] William K. Pratt, "*Digital Image Processing",* WILEY Publications, 3rd edition