M.C.A. SEM – V
MCA – EL2 : Digital Image Processing

Teaching Scheme (per week)		Examination Scheme					
		INT		EXT		TOTAL	
Th. (hours)	Pr. (hours)	Th. (marks)	Pr. (marks)	Th. (marks)	Pr. (marks)	Th. (marks)	Pr. (marks)
4	--	30	--	70	--	100	--

UNIT I **(25%)**

Introduction: What is Digital Image Processing, The origins of Digital Image Processing, Examples of Fields that use Digital Image Processing, Fundamental steps in Digital Image processing, Components of Image Processing system **Fundamentals:** · Elements of Visual Perception, Light and Electromagnetic Spectrum, Image Sensing and Acquisition, Image Sampling and Quantization, Some basic Relationships between Pixels, Linear and Nonlinear Operations

UNIT II **(25%)**

Image Enhancement in the spatial domain: Background, Some basic gray level transformation, Introduction of Histogram processing, Enhancement using Arithmetic/Logic operations, Basics of spatial filtering, Smoothing spatial filters, Sharpening spatial filters, **Image Enhancement in the Frequency Domain :** Introduction.

UNIT III **(25%)**

Image Restoration: A model of the Image Degradation/Restoration process, Noise Models, Restoration in the presence of noise only spatial filtering, Inverse filtering, Minimum Mean Square Error (Wiener) filtering, Geometric mean filter, Geometric Transformations, **Image Compression:** Fundamentals, Lossy Compression, Lossless Compression, Image Compression models, Error-free Compression : Variable length coding, LZW coding, Bit plane coding, Run length coding, Introduction to JPEG.

UNIT IV **(25%)**

Morphology: Dilation, Erosion, Opening and Closing, Hit-and Miss transform, Morphological Algorithms : Boundry Extraction, Region filling, Extraction of connected components, Convex Hull, Image Segmentation: Definition, characteristics of segmentation Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region based segmentation. Introduction to Representation & Description, Introduction to Object Recoginition.

Books :

1. Digital Image Processing.Rafael --- C. Gonzalez and Richard E.Woods. Addision Wesley.

Reference:

1. Fundamentals of Digital Image Processing. Anil K. Jain, PHI
2. Digital Image Processing and Analysis : B. Chanda & D. Dutta Majumber, PHI
3. Image Processing in C : Dwayne Phillips, BPB

Question Paper Scheme:

Section – I Section – II

Q.1 - Objective Type Unit I & II (11) Marks Q.4 - Objective Type Unit III & IV (11) Marks

Q.2 - Unit-I **OR** Q.2 Unit-I (12) Marks Q.5 - Unit-III **OR** Q.5 Unit-III (12) Marks

Q.3 - Unit-II **OR** Q.3 Unit-II (12) Marks Q.6 - Unit-IV **OR** Q.6 Unit-IV (12) Marks