

MANGALORE UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE
MSc Computer Science

CSS 507: DIGITAL IMAGE PROCESSING		
Hours/Week: 4 Credits : 4		I.A. Marks: 30 Exam. Marks: 70
Course Outcomes: CO1: Understand the need for image transforms different types of image transforms and their properties. CO2: Develop any image processing application. CO3: Understand the rapid advances in Machine vision. CO4: Learn different techniques employed for the enhancement of images. CO5: Learn different causes for image degradation and overview of image restoration techniques. CO6: Understand the need for image compression and to learn the spatial and frequency domain techniques of image compression. CO7: Learn different feature extraction techniques for image analysis and recognition		
	UNIT-I	12 Hrs.
Digitized image and its properties: Basic concepts, Image digitization, Digital image properties. Image Pre-processing: Image pre-processing; Histogram processing, Enhancement using arithmetic / logic operations, Basics of spatial filtering, Smoothing spatial filters, Sharpening spatial filters. Brightness and geometric transformations, local pre-processing.		
	UNIT-II	12 Hrs.
SEGMENTATION: Thresholding, Edge-based segmentation, Regionbased segmentation, Matching.		
	UNIT-III	12 Hrs.
IMAGE ENHANCEMENT: Image enhancement in the frequency domain: Background, Introduction to the Fourier transform and the frequency domain, Smoothing Frequency-Domain filters, Sharpening Frequency Domain filters, Homomorphic filtering. IMAGE COMPRESSION: Image compression: Fundamentals, Image compression models, Elements of information theory, Error-Free Compression, Lossy compression.		

	UNIT-IV	12 Hrs.
SHAPE REPRESENTATION: Region identification, Contour-based shape representation and description, Region based shape representation and description, Shape classes. MORPHOLOGY: Basic morphological concepts, Morphology principles, Binary dilation and erosion, Gray-scale dilation and erosion, Morphological segmentation and watersheds.		
REFERENCE BOOKS: 1. Milan Sonka, Vaclav Hlavac and Roger Boyle, Image Processing, Analysis and Machine Vision 2nd Edition, Thomson Learning, 2001. 2. Rafael C Gonzalez and Richard E Woods, Digital Image Processing, 2nd Edition, Pearson Education, 2003. 3. Anil K Jain, Fundamentals of Digital Image Processing Pearson Education/Prentice-Hall of India Pvt. Ltd., 1997. 4. B. Chanda, D Dutta Majumder, Digital Image Processing and Analysis Prentice-Hall India, 2002.		

