D.K.T.E. Society's Textile and Engineering Institute, Ichalkaranji
(An Autonomous Institute)
Final Year B. Tech. of Computer Science and Engineering
CSL403: Image processing

Teaching Scheme: TH: 03 Hours/Week	Credits 03	Examination Scheme SE-I: SE-II: SEE :

Prerequisite: - -

Course Objectives:
1.To learn the fundamental concepts of Digital Image Processing
2. To study basic image processing operations.
3. To cover the basic analytical methods which are widely used in image processing.

Course Outcomes:
On completion of the course, student will be able to-
1. Describe the basic issues and the scope of image processing, and the roles of image processing and systems in a variety of applications.
2. Explore different techniques in image acquisition and color transformation
3. Understand how digital images are represented
4.Evaluate the mathematical principles of digital image enhancement
5. Explore and apply the concepts of Edge detection, segmentation and object recognition.

	Course Contents	
Unit 1	INTRODUCTION	06 Hours
	Concept of digital image processing, steps in image processing, components of image processing system, Applications areas.	
Unit 2	DIGITAL IMAGE FUNDAMENTALS	07 Hours
	Image sensing and acquisition, Basic concept of sampling and quantization, representations of digital image, spatial and grey level resolution, zooming and shrinking of image, Basic relationship between pixels.	
Unit 3	COLOR IMAGE PROCESSING	06 Hours
	Colour fundamentals, colour models, RGB colour model, CMY colour model, HSI colour model, pseudo-colour image processing: intensity slicing, grey level to colour transformation.	
Unit 4	EDGE DETECTION AND SEGMENTATION	07 Hours
	Detection of discontinuities: point, line and edge detection, Thresholding, Region based segmentation	
Unit 5	IMAGE ENHANCEMENT IN SPATIAL DOMAIN	07 Hours
	Basic grey level transformations, image negation, log transformations, power law transformations, piece wise linear transformations, histogram processing, histogram equalization, histogram matching, Image enhancement using arithmetic and logical operations	

Unit 6	OBJECT RECOGNITION	06 Hours
	Patterns and Pattern Classes, Recognition Based on Decision-Theoretic Methods, Matching, Optimum Statistical Classifiers, Structural Methods, Matching Shape Numbers, String Matching.	

Books:
Text Books:
R.C.Gonzalez and R.E.Woods, "Digital Image Processing", Addison-Wesley Longman, Inc, 1999
Reference Books:
1.A.K.Jain, "Digital Image Processing", PHL 2. M.Sonka, V.Hlavac, and R.Boyle – Image processing, Analysis and Machine vision, Thomson Asia pvt. Ltd, 1999.