SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.
(An Autonomous Institute Affiliated to RGPV Bhopal)
DEPARTMENT OF IT

Semester/Year		VII/IV		Program			B.Tech – IT				
Subject Category	PROJ	Subject Code:		IT 801	Subject Name		Major Project				
Maximum Marks Allotted								Contact Hours			Total Credits
Theory				Practical			Total Marks				
ES	MS	Assignment	Quiz	ES	LW	Quiz		L	T	P	
				300	200		500	0	0	12	06

Prerequisites:

Knowledge of Computer Programming Language and MATLAB

Course Objective:

A) To study the image fundamentals and mathematical transforms necessary for image processing.
B) To study the image enhancement techniques.
C) To study image restoration procedures.
D) To study the image compression procedures.

UNITs	Descriptions	Hrs.
I	Digital Image Fundamentals: A simple image model, Sampling and Quantization. Relationship between pixels. Imaging geometry. Image acquisition systems, Different types of digital images.	8
II	Image Transformations Introduction to Fourier transforms, Discrete Fourier transforms, Fast Fourier transform, Walsh transformation, Hadmord transformation, Discrete Cosine Transformation.	8
III	Image Enhancement Filters in spatial and frequency domains, Histogram based processing. Image subtraction, Averaging, Image smoothing, Nedion filtering, Low pass filtering, Image sharpening by High pass filtering.	8
IV	Image Encoding and Segmentation Encoding: Mapping, Quantizer, Coder. Error free compression, Lossy Compression schemes. JPEG Compression standard. Detection of discontinuation by point detection, Line detection, edge detection, Edge linking and boundary detection, Local analysis, Global processing via Hough transforms and graph theoretic techniques.	8
V	Mathematical Morphology Binary, Dilation, crosses, Opening and closing, Simple methods of representation, Signatures, Boundary segments, Skeleton of a region, Polynomial approximation	8
Total Hours		40

Course Outcomes:

CO-1: Ability to apply principles and techniques of digital image processing in applications related to design and analysis of digital imaging systems. CO-2: Ability to analyze and implement image processing algorithms to real problems. CO-3: Gaining of hands-on experience in using software tools for processing digital images. CO-4: Interpret image segmentation and representation techniques. CO-5: Apply Mathematical Morphology using Polynomial approximation.

Text Book & Reference Books-

1. Rafael C Gonzalez, Richard E Woods 3rd Edition, Digital Image Processing Pearson.
2. Sonka, Digital Image Processing & Computer Vision, Cengage Learning.
3. Jayaraman, Digital Image Processing, TMH.
4. Pratt, Digital Image Processing, Wiley India.
5. Annadurai, Fundamentals of Digital Image Processing, Pearson Education.

List/Links of e-learning resource

- https://archive.nptel.ac.in

Modes of Evaluation and Rubric

The evaluation modes consist of performance in two mid semester Tests, Quiz/Assignments, term work, end semester practical examination.

CO-PO Mapping:

COs	PO_1	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO_9	PO_1	PO_{11}	PO_{12}	PSO1	PSO2
CO-1	3	3	2	3	1							2	3	1
CO-2		2	3	2	3									
CO-3	2	1	2	3	2								1	
CO-4		2	3	2								1		2
CO-5	2		2		2				1				1	

Suggestive list of experiments:

Recommendation by Board of studies on	
Approval by Academic council on	
Compiled and designed by	
Subject handled by department	Department of IT

Course ID	Discipline	Course Name	SME Name	Institute	Co-ordinating Institute	Duration	Remarks
noc24-cs04	Computer Science and Engineering	Privacy and Security in Online Social Media	Prof. Ponnurangam Kumaraguru	IIITH	IITM	12 weeks	
noc24-cs06	Computer Science and Engineering	Advanced Computer Architecture	Prof. Smruti Ranjan Sarangi	IITD	IITD	12 Weeks	
noc24-cs24	Computer Science and Engineering	Embedded System Design with ARM	Prof. Indranil Sengupta Prof. Kamalika Datta	IITKGP	IITKGP	8 Weeks	
noc24-cs26	Computer Science and Engineering	Foundation of Cloud IoT Edge ML	Prof. Rajiv Misra	IITP	IITK	8 Weeks	
noc24-cs34	Computer Science and Engineering	Introduction To Industry 4.0 And Industrial Internet Of Things	Prof. Sudip Misra	IITKGP	IITKGP	12 Weeks	
noc24-cs40	Computer Science and Engineering	Object Oriented System Development Using UML, Java And Patterns	Prof. Rajib Mall	IITKGP	IITKGP	12 Weeks	
noc24-cs52	Computer Science and Engineering	Reinforcement Learning	Prof. Balaraman Ravindran	IITM	IITM	12 Weeks	
noc24-cs62	Computer Science and Engineering	Probability for Computer Science	Prof. Nitin Saxena	IITK	IITK	8 Weeks	
noc24-cs65	Computer Science and Engineering	Business Intelligence & Analytics	Prof. Saji K Mathew	IITM	IITM	12 Weeks	
noc24-cs48	Computer Science and Engineering	Systems and Usable Security	Prof. Neminath Hubballi	IIT Indore	IITM	4 Weeks	

noc24-cs44	Computer Science and Engineering	Programming in Modern C++	Prof. Partha Pratim Das	IITKGP	IITKGP	12 Weeks	