B. P. Poddar Institute of Management & Technology

Department of Electronics & Communication Engineering

Course Outcomes and Their Mapping with POs/PSOs

Academic Year: 2018-19

Digital Image Processing (EC 801B)

COURSE PRE-REQUISITES:

C.CODE	COURSE NAME	DESCRIPTION	SEM
EC 303	Signals & Systems	Different types of signals and their properties, Signal Transformation eg. Fourier transformation, Laplace transformation.	III
EC 602	Digital Signal Processing	DFT, FFT, Filters	VI

COURSE OBJECTIVES:

1	Explain basic concept of image formation and transform techniques for image processing
2	Discuss different transform techniques used in digital image processing
3	Discuss different steps involved in digital image processing

COURSE OUTCOMES:

SNO	DESCRIPTION Students will be able to:	Blooms Level	PO(1..12) MAPPING	PSO(1..2) MAPPING
C413B.1	**Describe** the basic elements of image processing systems.	L3 Apply	PO1, PO12	PSO1, PSO2
C413B.2	**Apply** different transform techniques in image processing.	L4 Analyze	PO1, PO2, PO3, PO4, PO5, PO12	PSO1, PSO2
C413B.3	**Develop** various image enhancement and restoration techniques in spatial and frequency domain.	L4 Analyze	PO1, PO2, PO3, PO4, PO5, PO12	PSO1, PSO2
C413B.4	**Compare** image compression techniques in terms of compression ratio, redundancy and fidelity.	L3 Apply	PO1, PO2, PO3, PO4, PO5, PO12	PSO1, PSO2
C413B.5	**Construct** different morphological algorithms used in image processing.	L3 Apply	PO1, PO2, PO3, PO4, PO5, PO12	PSO1, PSO2
C413B.6	**Use** various methodologies for image segmentation	L3 Apply	PO1, PO2, PO3, PO4, PO5, PO12	PSO1, PSO2
COURSE OVERALL PO/PSO MAPPING: PO1, PO2, PO3, PO4, PO5, PO12, PSO1, PSO2				

MAPPING OF CO WITH PO/PSO (DETAILED; HIGH: 3; MEDIUM: 2; LOW: 1**):**

S.NO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C413B.1	3											1	1	1
C413B.2	3	2	2	1	1							2	2	2
C413B.3	3	2	2	1	1							2	2	2
C413B.4	3	2	2	1	1							2	2	2
C413B.5	3	2	2	1	1							2	2	2
C413B.6	3	2	2	1	1							2	2	2
C413B*	3	2	2	1	1							1.83	1.83	1.83

** For Entire Course, PO /PSO Mapping; 1 (Low); 2(Medium); 3(High) Contribution to PO/PSO*

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Lesson Plan for Digital Image Processing (EC 801B)

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L/ T No.	Topics to be Covered	Text/ References	Teaching Aid	Teaching Methodology
L1	Familiarization of the students with Institute and Department Vision, Mission, PEOs, POs, PSOs, COs and Course Overview		PPT, GGB, chalk, duster	Lecture
L2	Introduction to structure of human eye, Image formation in the human eye, Brightness adaptation and discrimination, Image sensing and acquisition	T1	PPT, GGB, chalk, duster	Lecture
L3	storage, Processing, Communication, Display	T1	PPT, GGB, chalk, duster	Lecture
L4	Introduction to Fourier transform, DFT and 2-D DFT	T1	PPT, GGB, chalk, duster	Lecture
L5	Properties of 2-D DFT, Properties of FFT, IFFT	T1	PPT, GGB, chalk, duster	Lecture
L6	Walsh transform	T1, T2	PPT, GGB, chalk, duster	Lecture
L7	Hadamard transform	T1, T2	PPT, GGB, chalk, duster	Lecture
L8	Discrete cosine transform	T1, T2	PPT, GGB, chalk, duster	Lecture
L9	Slant transform	T1, T2	PPT, GGB, chalk, duster	Lecture
L10	Optimum transform: Karhunen - Loeve (Hotelling) transform	T1, T2	PPT, GGB, chalk, duster	Lecture
T1	Problems on Image Transforms	T1, T2	GGB, chalk, duster	Problem solving, classroom discussion
L11	Gray level transformations, Histogram processing		PPT, GGB, chalk, duster	Lecture
L12	Arithmetic and logic operations	T1	PPT, GGB, chalk, duster	Lecture
L13	Spatial filtering: Introduction, Smoothing and sharpening filters	T1	PPT, GGB, chalk, duster	Lecture
L14	Frequency domain filters: Homomorphic filtering	T1	PPT, GGB, chalk, duster	Lecture
T2	Problems on image enhancement	T1	GGB, chalk, duster	Problem solving, classroom discussion
L15	Fundamentals, Redundancies: Coding, Interpixel Psycho-visual, fidelity criteria	T1	PPT, GGB, chalk, duster	Lecture
L16	Image compression models, Error free compression	T1, R1	PPT, GGB, chalk, duster	Lecture
L17	Lossy compression	T1	PPT, GGB,	Lecture

			chalk, duster	
L18	Image compression standards: Binary image and Continuous tone Still Image compression standards	T1	PPT, GGB, chalk, duster	Lecture
L19	Video compression standards.	T1	GGB, chalk, duster	Problem solving, classroom discussion
T3	Problems on morphological operation	T1	GGB, chalk, duster	Problem solving, classroom discussion, quiz
L20	Introduction, Dilation, Erosion, Opening, closing, Hit -or-miss transformation,	T1	GGB, chalk, duster	Lecture.
L21	Morphological algorithm operations on binary Images	T1	GGB, chalk, duster	Lecture.
L22	Morphological algorithm operations on gray-scale Images	T1	GGB, chalk, duster	Lecture.
T4	Problems on image segmentation	T1	GGB, chalk, duster	Problem solving, classroom discussion, quiz
L23	Detection of discontinuities, Edge linking and Boundary detection,.	T1	GGB, chalk, duster	Lecture.
L24	Thresholding Region based segmentation, Image Representation schemes,	T1	GGB, chalk, duster	Lecture.
L25	Boundary descriptors and Regional descriptors	T1	GGB, chalk, duster	Lecture.
T5	Problems on image segmentation	T1	GGB, chalk, duster	Problem solving, classroom discussion, quiz
T6	Discussions on previous year questions and model questions		GGB, chalk, duster	Problem solving, classroom discussion, quiz

GGB: Green glass board.

Text Books:

1. Anil K. Jain, Digital Image Processing (Prentice-Hall, India)
2. S.Sridhar, Digital Image Processing, Oxford Higher Education.

Reference Books:

1. R.C Gonzalez and R. Woods, Digital Image Processing, (Indian reprint: Pearson publication, 2001).

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GAP BEYOND THE SYLLABUS AND MAPPING TO PO/PSO:

S.NO.	DESCRIPTION	PROPOSED ACTIONS	PO/PSO MAPPED	LEVEL OF MAPPING
1	Colour image processing	Guest Lecture/ Assignment/NPTEL etc.	PO1, PO2, PO3, PO4, PO5, PO12, PSO1, PSO2	3, 2,2,1,2, 2,3,3

WEB SOURCE REFERENCES:

1	https://nptel.ac.in/courses/117105079/___
2	http://www.mediafire.com/file/xkr11mvcz3wq3nr/anil_k_jain.pdf

JOURNAL REFERENCES:

S.NO.	JOURNAL NAME	ISSN
1	Journal of Digital Imaging	0897-1889 (Print) 1618-727X (Online)
2	IEEE Transactions on Image Processing	1057-7149 (Print) 1941-0042 (Online)