



National Institute of Technology Meghalaya
An Institute of National Importance

CURRICULUM

Programme	Bachelor of Technology in Electronics and Communication Engineering	Year of Regulation	2018-19
Department	Electronics and Communication Engineering	Semester	VII
Course Code	Course Name	Credit Structure	Marks Distribution
		L T P C	INT MID END Total
EC 473	Fundamentals of Image and video Processing	2 0 0 2	50 50 100 200
Course Objectives	To study the fundamentals of digital image processing.	Course Outcomes	CO1 Ability to understand the fundamentals of digital image processing.
	To study the various enhancement and segmentation techniques used in image processing.		CO2 Ability to analyse the various enhancement and segmentation techniques used in image processing.
	To study the basic steps of video processing.		CO3 Ability to understand the basic steps of video processing.
	To study the different two dimensional motion estimation methods.		CO4 Ability to analyse the different two dimensional motion estimation methods

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
1	CO1	3	1	1	-	1	-	-	-	-	-	-	-	3	1	1	-
2	CO2	3	3	3	2	3	-	-	-	-	-	-	-	3	2	1	-
3	CO3	3	2	2	-	2	-	-	-	-	-	-	-	3	2	1	-
4	CO4	3	3	3	2	3	-	-	-	-	-	-	-	3	1	1	-

SYLLABUS

No.	Content	Hours	COs
I	Fundamentals of Image processing and Image Transforms: Basic steps of Image processing system, Sampling and Quantization of an Image, Basic relationship between Pixels, Image Transforms: 2 – D Discrete Fourier Transform, Discrete Cosine Transform (DCT), Discrete Wavelet transforms.	5	CO1
II	Image Processing Techniques: Image Enhancement in Spatial Domain methods and Frequency Domain methods, Segmentation concepts, Point, Line and Edge detection, Thresholding, region based segmentation.	8	CO2
III	Basic Steps of Video Processing: Analog video, Digital Video, Time varying Image Formation models: 3D motion models, Geometric Image formation, Photometric Image formation, Sampling of Video Signals, Filtering operations.	6	CO3
IV	2-D Motion Estimation: Optical flow, general methodologies, pixel based motion estimation, Block matching algorithm, Mesh based motion Estimation, global Motion Estimation, Region based motion estimation, multi resolution motion estimation.	7	CO4
Total Hours		26	

Essential Readings

- Gonzalez R. C. and Woods R. E, "Digital Image Processing", Pearson Prentice Hall, 2nd edition, 2002.
- Yaowang, JoemOstarmann and Ya-quinZhang, "Videoprocessing and communication", Prentice Hall International, 1st edition, 2001.

Supplementary Readings

- Gonzalez R. C, Woods R. E and Eddins S. L "Digital Image Processing using MATLAB", McGraw Hill Education, 2nd edition, 2017.
- M. Tekalp, "Digital video Processing", Prentice Hall International, 2nd edition, 2015.