

TCET/FRM/IP-02/09

Revision: A

Semester Plan (Theory)

Semester: VII

Course: EXTC

Subject: Image and Video Processing

Class: BE- A

S.No.	Bridge courses/Technology	Duration (Week/hrs)	Modes of Learning	Recommended Sources
1.	Prerequisite course: Signals and Systems	06 Hours	Technology Based learning	Principles of Linear Systems and Signals 2 nd Edition -B. P. Lathi Chapter 1 (Pg. No. 1 -83) Chapter 5(Pg. No.427-526)

Class Room Teaching

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
1		L1.1	SOP	LCD Projector	10/07/17		
2		L1.2	OBE	LCD Projector	11/07/17		
3		L1.3	IVP (Lab)	LCD Projector	11/07/17		
4	1	L2.1	Image acquisition, sampling and quantization	LCD Projector	17/07/17	M1.1	
5	1	L2.2	image resolution, basic relationship between pixels,	LCD Projector	18/07/17	M1.2	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
6	1	L2.3	color images, RGB, HSI and other models	LCD Projector	19/07/17	M1.3	
7	3	L2.4	Point Processing: Digital Negative, contrast stretching thresholding, gray level slicing,	LCD Projector	20/07/17	M3.1	
8	3	L2.5	bit plane slicing, log transform and power law transform	LCD Projector	21/07/17	M3.1	
9	3	L3.1	Neighborhood Processing: Averaging filters, order statistics filters,	LCD Projector	24/07/17	M3.2	
10	3	L3.2	High pass filter and high boost filter	LCD Projector	25/07/17	M3.2	
11	3	L3.3	Zooming- replication and linear interpolation	LCD Projector	26/07/17	M3.3	
12	3	L3.4	1 Dimensional Fourier Transform and 2 Dimensional Fourier Transform	LCD Projector	27/07/17	M3.4	
13	3	L4.1	Freq. Domain DFT for filtering Ideal, Gaussian and Butterworth filter	LCD Projector	01/08/17	M3.5	
14	3	L4.2	Freq. domain analysis LPF and HPF	LCD Projector	02/08/17	M3.6	
15	3	L4.3	Sharpening and homomorphic filter	LCD Projector	03/08/17	M3.7	
16	3	L5.1	Histogram equalization and specification	LCD Projector	07/08/17	M3.8	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
17	3	L5.2	Sums on histogram equalization	LCD Projector	08/08/17	M3.9	
18	2	L5.3	Two dimensional transform DFT	LCD Projector	09/08/17	M2.1	
19	2	L5.4	Discrete cosine transform	LCD Projector	10/09/17	M2.2	
20	2	L6.1	K.L. Transform , Discrete wavelet transform	LCD Projector	14/08/17	M2.3	
21	2	L6.2	Discrete wavelet transform	LCD Projector	16/08/17	M2.4	
22	4	L8.1	Image segmentation and morphology Point , line and edge detection	LCD Projector	30/08/17	M4.1	
23	4	L8.2	Edge linking through graph theoretic techniques	LCD Projector	31/08/17	M4.2	
24	4	L9.1	Thresholding Region based segmentation	LCD Projector	04/09/17	M4.3	
25	4	L9.2	Dilation, Erosion, opening and closing	LCD Projector	05/09/17	M4.4	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
26	4	L9.3	Restoration using Weiner filter and inverse filter	LCD Projector	06/09/17	M4.5	
27	4	L9.4	Morphological operations on images	LCD Projector	07/09/17	M4.6	
28	4	L10.1	Hit and miss transform	LCD Projector	11/09/17	M4.7	
29	4	L10.2	Thinning and thickening	LCD Projector	12/09/17	M4.8	
30	5	L10.3	Boundary extraction on binary images	LCD Projector	13/09/17	M5.1	
31	5	L10.4	Image Restoration Degradation model , noise model	LCD Projector	14/09/17	M5.2	
32	5	L11.1	Estimation of degradation function by modelling	LCD Projector	19/09/17	M5.3	
33	6	L11.2	Video formation Perception and representation , Digital video sampling	LCD Projector	20/09/17	M6.1	
34	6	L11.3	Video Frame Classification ITV-RBT 601, Digital video formats	LCD Projector	21/09/17	M6.2	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completi on Date	Resource Book Reference	Remarks
35	6	L12.1	Digital Video quality measures	LCD Projector	25/09/17	M6.3	
36	6	L12.2	Principle of color video camera, Digital Video	LCD Projector	26/09/17	M6.4	
37	6	L13.1	Required Sampling rates , sampling in 2 and 3 dimension	LCD Projector	03/10/17	M6.5	
38	6	L13.2	Progressive interlaced scans	LCD Projector	04/10/17	M6.6	
39	7	L13.3	Two Dimensional motion estimation Optical flow – 2D motion vs optical flow	LCD Projector	05/10/17	M7.1	
40	7	L.14.1	Optical flow eqn motion representation motion estimation criteria	LCD Projector	12/10/17	M7.2	
41	7	L15.1	Optimization method Regularization using motion smoothing	LCD Projector	16/10/17	M7.3	
42	7	L15.2	Regularization using multiple neighbourhood	LCD Projector	17/10/17	M7.4	
43	7	L15.3	Exhaustive block matching algorithm, Binary feature matching and hierarchical block matching algorithm	LCD Projector	17/10/17	M7.5	
44	1-7	L15.4	Revision and Doubt solving	LCD Projector	18/10/17	M 1-7	
45	1-7	L15.5	University paper solving	LCD Projector	18/10/17	M1 -7	
Remark:: Course:		Syllabus Coverage:		Practice Session:		Beyond Syllabus:	
No. of (lectures planned)/(lecture taken): (45) / ()							

Bridge courses Objective: Bridging of gaps with respect to prerequisites and industry skills or to carryout research in signal processing field. (20 Hrs / Semester / student)

S.No.	Bridge courses/Technology	Duration (Week/hrs)	Modes of Learning	Recommended Sources
1	Advanced course: Digital Image Processing of Remote Sensing Data (NPTEL Course)	20 Hours	Technology Based learning	https://onlinecourses.nptel.ac.in/noc17_ce26/preview

Text Books:

- 1) Gonzales and Woods, Digital Image Processing, Pearson Education, India, Third Edition,
- 2) Anil K. Jain Fundamentals of Image Processing, Prentice Hall of India, First Edition, 1989.
- 3) 3. Murat Tekalp, Digital Video Processing, Pearson, 2010

Reference Books:

- 1) John W. Woods, Multidimensional Signal, Image and Video Processing, Academic Press 2012
- 2) J.R. Ohm, "Multimedia Communication Technology", Springer Publication.
- 3) A.I. Bovik, "Handbook on Image and Video Processing", Academic Press.

Digital Reference:

- Wikipedia
- Google
- <https://www.coursera.org/learn/digital>

(Mr. Deepak S. Shete)

Name & Signature of Faculty

(Dr. Vinitkumar Dongre)

Signature of HOD

(Dr. R. R. Sedamkar)

Signature of Principal /Dean (Academics)

Date:

Date:

Date:

Note:

1. Plan date and completion date should be in compliance
2. Courses are required to be taught with emphasis on resource book, course file, text books, reference books, digital references etc.
3. Planning is to be done for 15 weeks where 1st week will be AOP, 2nd -13th for effective teaching and 14th -15th week for effective university examination oriented teaching, mock practice session and semester consolidation.
4. According to university syllabus where lecture of 4 hrs/per week is mentioned minimum 55 hrs and in case of 3 lectures per week minimum 45 lectures are to be engaged are required to be engaged during the semester and therefore accordingly semester planning for delivery of theory lectures shall be planned.
5. In order to improve score in NBA, faculty members are also required to focus course teaching beyond university prescribed syllabus and measuring the outcomes w.r.t learning course and programme objectives.
6. Text books and reference books are available in syllabus. Here only additional references w.r.t non –digital/ digital sources can be written (if applicable)
7. Technology to be used in class room during lecture shall be written below the topic planned within the bracket.