

TCET ECTRONICS ENGINEERING (ETRX) Scheme(Revised - 2012) - University of Mumbai CBGS-2012(R) DEPARTMENT OF EL



TCET/FRM/IP-02/09

Semester: VII

Semester Plan (Theory)

Revision: A

Course: ETRX Class: BE ETRX

Subject: : EXC7051 Digital Signal Processing

S.No.	Prerequisite/ Bridge course:	Duration (Week /Hrs)	Modes of Learning	Recommended Sources
1	EXS 401:Applied mathematics-IV EXS 504: Signals and Systems	20 hours	NPTEL on line Course	 Textbooks: 1. Gonzalez & Woods, Digital Image Processing, Pearson Education, Second edition. 2. W. Pratt, Digital Image Processing, Wiley Publication, third edition, 2002. 3. S.Jayaraman Digital Image Processing TMH (Mc Graw Hill) publication 4. MilinSonaka , Digital Image Processing and computer vision cengage learning, Thomson publication second edition.2007.

Class Room Teaching

Sr. No	Module No.	Lesson No	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completio n Date	Resource Book Reference	Remarks
1	SOP	L1.1	Digital Signal Processing(theory)	Power point presentation, Chalk & Board	12.07.17		
2	SOP	L1.2	Digital Signal Processing(OBE)	Power point presentation, Chalk & Board	12.07.17		
3	SOP	L1.3	Digital Signal Processing(pract)	Power point presentation, Chalk & Board	13.07.17		
4	Module 1	L2.1	Chapter 1: Digital Image Processing Fundamentals: Introduction: Background,	Power point presentation, Chalk & Board	17.07.17	M 1.1	
5	Module 1	L2.2	Digital Image Fundamentals: Elements of Visual Perception, A Simple Image Model	Power point presentation, Chalk	19.07.17	M 1.2	
6	Module 1	L2.3	Sampling and Quantization, Some Basic Relationships between Pixels	presentation, Chalk & Board	20.07.17	M 1.3	
7	Module 1	L2.4	Imaging Geometry	Chalk & Board, Animation	21.07.17	M 1.4	
8	Module 1	L3.1	Image File Formats: BMP, TIFF and JPEG	Power point presentation, Chalk & Board	24.07.17	M 1.5	
9	Module 1	L3.2	Color Models (RGB, HIS, YUV)	Chalk & Board, Animation	26.07.17	M 1.6	
10	Module 2	L3.3	Chapter 2: Image Enhancement: Spatial	Power point	27.07.17	M 2.1	
			Domain Methods	& Board			
11	Module 2	L3.4	Frequency Domain Methods	Power point presentation, Chalk & Board	28.07.17	M 2.2	
12	Module 2	L4.1	Some Simple Intensity Transformations, Histogram Processing	Power point presentation, Chalk & Board	31.07.17	M 2.3	
13	Module 2	L4.2	Image Subtraction, Image Averaging, Background	Power point presentation, Chalk & Board	02.08.17	M 2.4	
14	Module 2	L4.3	Smoothing Filters, Sharpening Filters	Power point presentation, Chalk	03.08.17	M 2.5	
15	Module 2	L4.4	Low pass Filtering, High pass Filtering	Power point presentation, Chalk	04.08.17	M 2.6	

16	Module	2	L5.1	Generation of Spatial Masks from Frequency Domain Specifications	Chalk & Board, Animation	07.08.17	M 2.7	
17	Module	2	L5.2	Homomorphic Filtering	Power point presentation, Chalk & Board	09.08.17	M 2.8	
18	Module	3	L5.3	Chapter 3: Image Segmentation and Representation: Detection of Discontinuities	Power point presentation, Chalk & Board	10.08.17	M 3.1	
19	Module	3	L5.4	Edge Linking using Hough Transform	Power point presentation, Chalk & Board	11.08.17	M 3.2	
20	Module	3	L6.1	Thresholding, Region based Segmentation	Power point presentation, Chalk & Board	14.08.17	M 3.3	
21	Module	3	L6.2	Split and Merge Technique	Power point presentation, Chalk & Board	16.08.17	M 3.4	
22	Module	3	L6.3	Image Representation and Description	Power point presentation, Chalk & Board	18.08.17	M 3.5	
23	Module	3	L8.1	Chain Code	Power point presentation, Chalk & Board	30.08.17	M 3.6	
24	Module	3	L8.2	Polygon, Representation, Shape Number, Moments	Power point presentation, Chalk & Board	31.08.17	M 3.7	
25	Module	4	L8.3	Chapter 4: Binary Image Processing: Binary Morphological Operators	Power point presentation, Chalk & Board	01.09.17	M 4.1	
26	Module	4	L9.1	Hit – or – Miss Transformation, Boundary Extraction	Power point presentation, Chalk & Board	04.09.17	M 4.2	
27	Module	4	L9.2	Region Filling, Thinning and Thickening, Connected Component Labeling	Power point presentation, Chalk & Board	06.09.17	M 4.3	
28	Module	4	L9.3	Iterative Algorithm and Classical Algorithm	Power point presentation, Chalk & Board	07.09.17	M 4.4	
29	Module	5	L9.4	Chapter 5: Image Transform: Introduction to the Fourier Transform	Power point presentation, Chalk & Board	08.09.17	M 5.1	
30	Module	5	L10.1	The Discrete Fourier Transform (DFT)	Chalk & Board, Animation	11.09.17	M 5.2	
31	Module	5	L10.2	Some Properties of the Two- Dimensional Fourier Transform	Power point presentation, Chalk & Board	13.09.17	M 5.3	
32	Module	5	L10.3	Fast Fourier Transform (FFT)	Power point presentation, Chalk & Board	14.09.17	M 5.4	
33	Module	5	L10.4	Discrete Hadamard Transform (DHT)	Power point presentation, Chalk & Board	15.09.17	M 5.5	

34	Module 5	L11.1	Fast Hadamard Transform (FHT)	Chalk & Board, Animation	18.09.17	M 5.6	
35	Module 4	L11.2	Discrete Cosine Transform (DCT)	Power point presentation, Chalk & Board	20.09.17	M 5.7	
36	Module 5	L11.3	Discrete Wavelet Transform (DWT)	Chalk & Board, Animation	21.09.17	M 5.8	
37	Module 6	L11.4	Chapter 6: Image Compression: Fundamentals – Coding Redundancy, Interpixel Redundancy,	Chalk & Board, Animation	22.09.17	M 6.1	
38	Module 6	L12.1	Image Compression Models – The Source Encoder and Decoder, Fidelity Criteria	Power point presentation, Chalk & Board	25.09.17	M 6.2	
39	Module 6	L12.2	Lossless Compression Techniques – Run Length Coding	Power point presentation, Chalk & Board	27.09.17	M 6.3	
40	Module 6	L12.3	Arithmetic Coding	Power point presentation, Chalk & Board	2809.17	M 6.4	
41	Module 6	L12.4	Huffman Coding, Differential PCM	Power point presentation, Chalk & Board	29.09.17	M 6.5	
42	Module 6	L13.1	Lossy Compression Techniques: Improved Gray Scale Quantization	Power point presentation, Chalk & Board	04.10.17	M 6.6	
43	Module 6	L13.2	Vector Quantization, JPEG, MPEG - 1	Power point presentation, Chalk & Board	05.10.17	M 6.7	
44	Module 1	L13.3	Revision of Chapter - 1	Power point presentation, Chalk & Board	06.10.17		
45	Module 2	L14.1	Revision of Chapter - 2	Power point presentation, Chalk & Board	12.10.17		
46	Module 3	L14.2	Revision of Chapter - 3	Power point presentation, Chalk & Board	13.10.17		
47	Module 4	L15.1	Revision of Chapter - 4	Power point presentation, Chalk & Board	16.10.17		
48	Module 5	L4.5	Revision of Chapter - 5	Power point presentation, Chalk & Board	05.08.17		
49	Module 6	L6.4	Revision of Chapter - 6	Power point presentation, Chalk & Board	19.08.17		
50	Revision	L8.4	University Paper Solution	Chalk & Board, Animation	02.09.17		
51	Revision	L10.5	University Paper Solution	Chalk & Board, Animation	16.09.17		
52	Revision	L11.5	University Paper Solution	Chalk & Board, Animation	23.09.17		
Remark: Course:	Remark: Syllabus Coverage: Course:		Practice Session: 03		Content Beyond Syllabus: Application of Linked List to organize by solving problems and solutions of respective theory.		
No. of (lectures planned)/(lecture taken): 52							

			web sources:		
	20 Hours	Online	1. NPTEL-https://onlinecourses.nptel.ac.in		
		NPTEL	2. www.tutorialpoint.com1. Instructor's study		
Advanced course: Digital Image Processing		videos with	material,		
	20 HOUIS	Hands on Textbook reference:	Textbook reference:		
		Training in	1.Rafel C. Gonzalez and Richard E. Woods,		
		Laboratory	'Digital Image Processing', Pearson Education		
			Asia Third Edition 2000		

1. Gonzalez &

Textbooks:

Woods, Digital Image Processing, Pearson Education, Second edition.

- 2. W. Pratt, Digital Image Processing, Wiley Publication, third edition, 2002.
- 3. S.Jayaraman Digital Image Processing TMH (Mc Graw Hill) publication

4. MilinSonaka, Digital Image Processing and computer vision cengage learning, Thomson publication second edition.2007.

5. A.K. Jain, Fundamentals of Image processing, Prentice Hall of India Publication, 1995

6. Gonzalez & Woods, Digital Image Processing using MATLAB, Pearson Education

Reference Books:

7.Mc. Andrew, "Introduction to Digital Image Processing with Matlab", Cengage Learning Publication.

8.Doubherty, "Digital Image Processing for Medical Application", Cambridge.

Digital Reference:

1. www.nptel.ac.in: Online course on: "Digital Image Processing".

Name & Signature of Faculty

Signature of HOD

Signature of Principal /Dean (Academics)

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.