



FACULTY OF ENGINEERING & TECHNOLOGY

First Year Master of Engineering

Semester II

Course Code: 102430208

Course Title: Signal Processing and Communication Laboratory

Type of Course: Program Elective IV

Course Objectives: This is the lab course exclusively design to enhance the practical background of PG students in the field of signal processing and communication. This course clarifies theoretical and practical background of many signal processing and communication algorithms. Course also enhances the preliminary knowledge required to realize any digital signal processing algorithm into the hardware.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
Lecture	Tutorial	Practical		Internal		External		Total
				Theory	J/V/P*	Theory	J/V/P*	
0	0	8	4	NA	50/25	NA	50/25	100/50

* J: Jury; V: Viva; P: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	Perform image compression using huffman coding	02
2	Perform image negative and thresholding using DSK6713	02
3	Implementation of histogram equalization using DSK 6713	02
4	Perform contrast stretching operation in DSK6713	02
5	Perform logical operation on an input image using DSK6713.	02
6	Perform image filtering using DSK6713	02
7	Perform image rotation operation on an input image using DSK6713.	02
8	Add transparent object in an input image using MATLAB	02
9	Write a MATLAB program for generating the panoramic image from given images	02
10	Detect the numbers from an input text image using MATLAB(optical character recognition)	02
11	Detect the touching objects and determine its feature vector from an input text image using MATLAB.	02
12	To study and software implementation of DTMF signal generator and decoder.	02
13	To study and implement amplitude modulator using DSK-6713	02
14	To study and analyze BER performance of different modulation techniques Under different channel conditions.	02
15	To study Phase lock loop and implementation of PLL based frequency Synthesizer.	02
16	To study and analysis of LMS algorithm for adaptive noise cancellation.	02



17	To study and analysis of MIMO Communication system	02
18	To study and analysis SIC and GSIC based multiuser detection schemes.	02
19	Introduction to universal software define radio peripherals.	02
20	To study and perform spectrum sensing using software define radio	02
21	To Study and Implement UDP/TCP protocol.	02
22	To study and analysis of thermal noise in communication system.	02
23	To study and analysis of rain attenuation in communication system.	02

Reference Books:

1	B.P/Lathi, Zhi Ding, "Modern Digital and Analog Communication System", Oxford University Press
2	Herbert Taub, Donald Schilling, "Principles of Communication Systems", McGeawHill Education.
3	Simon Haykin, Michale Moher, "Modern Wireless Communications", Pearson
4	Xiaodong Wang, H. Vincent Poor, "Wireless Communication Systems: Advanced Techniques for Signal Reception", Pearson.
5	Theodore S. Rappaport, "Wireless Communications: Principles and Practice" Second Edition, Pearson Education.
6	R.C.Gonzalez, R.E.Woods, "Digital Image Processing", 3/e Pearson Education.
7	S. Jayaraman , S.Esakkirajan, "Digital Image Processing", McGraw Hill.
8	Horst Bunke, Abraham Kandel, "Applied Pattern Recognition", Springer International Edition, Springer.
9	Frank Y.Shih, "Image Processing and Mathematical Morphology", CRC Press
10	Gonzalez, Woods and Eddins, " Digital Image Processing using MATLAB, McGrawHill
11	Frank Shih," Image Processing and Pattern Recognition, Wiley
12	Margues Q.," Practical Image and Video processing using MATLAB, Wiley
13	Apte Shaila, "Digital Signal Processing", Wiley
14	Gopi E.S., " Algorithm Collections for Digital Signal processing applications using MATLAB, Springer

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	To study various image processing algorithms and techniques.	50%
CO-2	To understand design of various communication systems, parameters implementation in hardware.	20%
CO-3	To design various wireless communication algorithm	25%
CO-4	To understand noise effect in communication system	5%

Supplementary learning Material:

1	MATLAB
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2	NI LabVIEW®
3	Software Define Radio,
4	RF Transmitter/Receiver system
5	DSP kit (DSK-6713)(TI)
6	Code Composer Studio(TI)

Curriculum Revision:	
Version:	1
Drafted on (Month-Year):	Apr-20
Last Reviewed on (Month-Year):	Jul-20
Next Review on (Month-Year):	Apr-22