Shri G. S. Institute of Technology and Science, Indore
Department of Electronics and Telecommunication Engineering

Date: 18/06/2024

Minutes of BoS meeting

The Board of Studies (BoS) meeting of Department of Electronics and Telecommunication Engineering department was held in the hybrid mode on 11/06/2024 at 4:30 PM. Following members have attended the meeting.

SHRI G.S. INSTITUTE OF TECHNOLOGY AND SCIENCE, INDORE -3
DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION
Board of Studies meeting

Attendance Sheet

Date: 11/06/2024

S.No.	Name of Expert/ Faculty Members	Signature
1.	Dr. (Mrs.)Anjana Jain, Chairman & Head of Dept.	Anjana Jain
2	Prof.Vimal Bhatia (IIT Indore) Expert	On line
3	Prof. Aditya Trivedi (IIT Gwalior) Expert	On line
4	Pro. Jyoti Singhal (MANIT ,Bhopal) Expert	On Line
5	Prof. S.P. Mahajan (CoEP, Pune) Expert	ON Line
6	Mr. Saumitra Kale (Director, CISCO System) Expert	ON Line
7	Dr. Shekhar Sharma	
8	Dr. S.E. Jain	(Offline)
9	Dr. L.D. Malviya	11/06/24
10	Dr. (Mrs.) Anjulata Yadav	
11	Dr. (Mrs.) Preeti Trivedi	
12	Mr. Manish Panchal,	
13	Mr. Amit Naik	11/6/24
14	Mrs. Rekha Jain	
15	Dr. (Mrs.) Jaya Dipti Lal	11/06/24
16	Mr. Ashwin Shrivastava	
17.	Mr. Ajay Parmar	
18	Dr. (Ms) Vaisnali Naik	
19	Mr. Shubham Shrivastava	
20	Ms. Deepali Kothari	
21	Mr. Mohit Khamele	
22	Mr. Neeraj Malviya	
23	Mrs. Rhika Nair,	
24	Mrs. Neeta Sharma	

Anjana Jain
HOD
Elx. & TC Depart.

The following member could not attend the meeting:

Mr. Saumitra Kale, (Director, CISCO System) Expert

The follwing points are discussed and resolved in the meeting:

- DPAQIC minutes are discussed and approved in the BoS meeting.
- A new subject "EC35__: Artificial Neural Network" is added in the B. Tech Third year Sem B in OEC-2, Electronics and Telecommunication Engineering scheme. The syllabus of "EC35__: Artificial Neural Network" has been discussed and approved in the BoS meeting. New syllabi of the above mentioned subject is attached herewith.
- A new subject "EC65__: Digital image processing" is added in the Ist Year Sem B PG Electronics and Communication Engineering scheme. The syllabus of "EC65__: Digital image processing" has been discussed and approved in the BoS meeting. New syllabi of the above mentioned subject is attached herewith.
- Department of Electronics and Instrumentation requested a new subject "EC355__: Mobile Communication" subject is third year sem B. Syllabus of EC355__: Mobile Communication has been discussed and approved in the BoS meeting. New syllabi of the above mentioned subject is attached herewith.

Anjana Jain

Prof. Anjana Jain
Head
Electronics and Telecommunication
Engineering Department

EC35XXX: ARTIFICIAL NEURAL NETWORK

COURSE OBJECTIVES:

- To illustrate the fundamental of artificial neural networks
- To explore the perception networks
- To interpret various neural network
- To analyze the Self Organizing Maps for Engineering Problems.
- To implement various ANN for real time problem applications.

Hours/ Week			Maximum Marks				Total Marks	Credits		
			Theory		Practical					
L	T	P	End Sem	CW	SW	End Sem		Th	Pr	Total
3	-	-	70	30	-	-	100	3	-	3

Unit 1: Biological Neuron and their artificial model i.e. McCulloch-Pitts Neuron Model Neuron Modeling for Artificial Neural System, Basic Concepts of Artificial Neural Network (ANN), Similarity with biological neurons, Basic building of ANN (Architecture, Weights, activation functions etc.), Models of Artificial Neural Networks, Feed forward Network, Feedback Network, Neural Network Learning Rules

Unit II: Perceptron Networks: Single layer perceptron; architecture, Algorithm, application procedure, Multilayer perceptron network, Generalized Delta Learning Rule, Feed forward Recall and Error Back-Propagation Training, Learning Factors

Unit III: Machine Learning Using Neural Network, Supervised Learning Neural Networks, Unsupervised Learning Neural Networks, Radial Basis Function Networks, Reinforcement Learning, Adaptive Resonance architectures, Advances in Neural networks.

Unit IV: Self Organizing Maps: Hamming Net and MAXNET, Unsupervised Learning of Clusters, Clustering and Similarity Measures, Winner-Take-All Learning, Recall Mode, Initialization of Weights, Separability Limitations, Kohonan Self Organizing feature Maps

Unit V: Support Vector Machine (SVM), Need for SVM, SVM classifier, Developing ANN models with the help of computer software such as MATLAB for solving real-life problems and related performance measures with graphical interface. Apply Neural Network for image processing problems, RF and Microwave Problems etc.

Text Books:

1.Introduction to Neural Networks using MATLAB by SN Sivanandam, S sumathi, S.N Deepa
2 Introduction to Artificial Neural Network by JACEK M. Zurada
3. Elements of Artificial Neural Network by Kishan Mehrotra, Chilukuri K. Mohan , Sanjay Ranka
4 Artificial Neural Networks by S. Haykins and Macmilan

Reference:

1. Ian Good fellow, Yoshua Bengio, Aaron Courville, "Deep Learning", MIT Press, 2016.

EC65...: DIGITAL IMAGE PROCESSING

COURSE OUTCOMES: Students will be able to

1: Comprehend the image processing fundamentals

2: Analyze images in the frequency domain using various transforms.

3: Design and implement two dimensional spatial an frequency filters for image enhancement

4: Evaluate image restoration and segmentation techniques.

5: Demonstrate image compression Techniques.

Hours/ Week			Maximum Marks				Total Marks	Credits		
			Theory		Practical					
L	T	P	End Sem	CW	SW	End Sem		Th	Pr	Total
3	-	-	70	30	-	-	100	3	-	3

Unit.1 Fundamentals of Image Processing and Image Perception

Two-dimensional signal and systems - linear systems and shift invariance. Fourier transform, Z - transform. Color vision model, Elements of a digital image processing system, image sampling and quantization, types of images, some basic relationships between pixels, point spread function.

Concept of pixels and gray levels,

Unit.2 Image Transforms

2-D FFT and its properties, discrete cosine Transform, Haar transform, K L transform, wavelet transform.

Unit. 3 Image Enhancement

Gray level transformations, Histogram processing, local& global enhancement techniques, Spatial filtering: low pass, high pass and derivative filters, median filtering. Frequency domain filters: low pass and high pass filters, Image Analysis Feature extraction, spatial features, amplitude and histogram features, transform features,

Unit. 4 Image Restoration and Segmentation

Noise degradation model, estimation of degradation model. Restoration in presence of noise, inverse filter and least mean square error(wiener) filtering. Segmentation: Edge detection, Edge Linking and Boundary detection, Region based segmentation. Morphological processing- erosion and dilation.

Unit:5 Image Compression Fundamentals, Image Compression models, Error Free Compression, Lossy compression, Image Compression standards

ASSESMENT:Mid-termtest,Assignment,Tutorial,QuizandEndsemesterexam.

TEXTBOOKS RECOMMENDED:

- GonzalezRafelC,WintzPaul,*DigitalImageProcessing*,AddisonWesley,1987.
- JainAnilK,*FundamentalsofDigitalImageProcessing*,PrenticeHall,1996.
- B.Chanda,D.Majumder,*DigitalImageProcessingandAnalysis*,PHI,2011.

REFERENCEBOOKSRECOMMENDED:

- PrattWilliamK,*DigitalImageProcessing*,JohnWileyandSons,2006

EC355-- : Mobile Communication
(Electronics and Instrumentation Engg.)

Course Outcomes: At the end of this course students will be able to:

1. Demonstrate knowledge of cellular Architecture, and GSM standard.
2. Analyze the fading channel characteristics for large and small-scale fading.
3. Describe the concept of different fading mitigation techniques.
4. Apply fundamental concepts of speech coding, Modulation
5. Define basic concept of emerging transmission technologies.

Hours Week			Maximum Marks				Total Marks	Credits		
			Theory		Practical					
L	T	P	End Sem	CW	SW	End Sem		Th	Pr	Total
3	-	-	70	30	-	-	100	3	-	3

Unit 1:Cellular Architecture: Mobile Generation evolution, cellular architecture, Frequency Re-use, Channel Assignment Strategies, Handoff Process, and Strategies. Co-channel Interference (CCI), Adjacent Channel Interference (ACI), Cell Splitting, Sectoring, GSM architecture, specification and Frame structure.

Unit 2: Large and small scale Fading: Multipath propagation and fading, review of Reflection, Diffraction, Scattering, path loss, Large scale fading and its models, Log-normal Shadowing, Small Scale Fading, Power delay profile, delay spread, Doppler spread, coherence bandwidth, coherence time.

Unit 3: Fading mitigation techniques: Classification of fading channel, Concept of Diversity, Receiver Diversity methods, Transmitter diversity, Equalization and adaptive equalization, channel coding.

Unit 4: Speech coding and Modulation - Basic properties of speech, Speech coding for wireless system, time domain and frequency domain coder, Modulation techniques for mobile communication, Probability of Error.

Unit 5: Emerging transmission technologies: Spread spectrum technique and its types, OFDM transmitter and receiver, review of CDMA, Power and Bandwidth tradeoff, Introduction of Cognitive Radio.

ASSESMENT: Mid-term test, Assignment, Tutorial, Quiz and End semester exam.

TEXT BOOKS RECOMMENDED:-

1. Rappaport T.S., Wireless Communications: Principles and Practice, 2nd ed., 2004 PHI.
2. Aditya K. Jagannatham, Principles of Modern Wireless Communications Systems Published by McGraw-Hill Education
3. Andreas F. Molisch Wireless Communications, 2nd ed., 2001, Wiley Pub.

REFERENCE BOOKS RECOMMENDED:-

1. Wilkis and Garg, Principles of GSM Technology, 2nd ed. 2004, PHI.
2. Ramji Prasad and Richard Van Nee, OFDM Wireless Multimedia Communication, 2nd ed. 1998, Artech House.