JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.Tech. COMPUTER AND COMMUNICATION ENGINEERIN
COURSE STRUCTURE AND SYLLABUS
G

I YEAR   - I Semester

Code	Group	Subject	L	P	Credits
		Advanced Data Communications	3	0	3
		Internetworking	3	0	3
		Advanced Digital Signal Processing	3	0	3
		Image & Video Processing	3	0	3
	Elective -I	Detection and Estimation Theory	3	0	3
		CPLD & FPGA Architectures and Applications			
		Artificial Intelligence			
	Elective -II	Voice over Internet Protocol	3	0	3
		Satellite Communications			
		Microcontrollers for Embedded system Design			
	Lab	Simulation Lab (Communication Lab)	0	3	2
		Seminar	-	-	2
		Total Credits (6 Theory + 1 Lab.)			22

I Year -I Sem M.Tech. (CCE)

ADVANCED DATA COMMUNICATIONS

Unit-I:

Digital Modulation: Introduction, Information Capacity Bits, Bit Rate, Baud, and M-ARY Coding, ASK, FSK, PSK, QAM, BPSK, QPSK, 8PSK, 16PSK, 8QAM, 16QAM, DPSK – Methods, Band Width Efficiency, Carrier Recovery, Clock Recovery.

Unit -II:

Basic Concepts of Data Communications, Interfaces and Modems: Data Communication- Components, Networks, Distributed Processing, Network Criteria- Applications, Protocols and Standards, Standards Organizations- Regulatory Agencies, Line Configuration- Point-to-point- Multipoint, Topology- Mesh- Star- Tree- Bus- Ring- Hybrid Topologies, Transmission Modes- Simplex- Half duplex- Full Duplex, Categories of Networks- LAN, MAN, WAN and Internetworking, Digital Data Transmission- Parallel and Serial, DTE- DCE Interface- Data Terminal Equipment, Data Circuit- Terminating Equipment, Standards EIA 232 Interface, Other Interface Standards, Modems- Transmission Rates.

Unit-III:
Error Detection and Correction: Types of Errors- Single- Bit Error, CRC (Cyclic Redundancy Check)- Performance, Checksum, Error Correction- Single-Bit Error Correction, Hamming Code.

Data link Control: Stop and Wait, Sliding Window Protocols.

Data Link Protocols: Asynchronous Protocols, Synchronous Protocols, Character Oriented Protocol- Binary Synchronous Communication (BSC) - BSC Frames- Data Transparency, Bit Oriented Protocols – HDLC, Link Access Protocols.

Unit-IV:

Switching: Circuit Switching- Space Division Switches- Time Division Switches- TDM Bus- Space and Time Division Switching Combinations- Public Switched Telephone Network, Packet Switching- Datagram Approach- Virtual Circuit Approach- Circuit Switched Connection Versus Virtual Circuit Connection, Message Switching.

Multiplexing: Time Division Multiplexing (TDM), Synchronous Time Division Multiplexing, Digital Hierarchy, Statistical Time Division Multiplexing.

Unit-V:

Multiple Access: Random Access, Aloha- Carrier Sense Multiple Access (CSMA)- Carrier Sense Multiple Access with Collision Detection (CSMA)- Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA), Controlled Access- Reservation- Polling- Token Passing, Channelization- Frequency- Division Multiple Access (FDMA), Time - Division Multiple Access (TDMA), - Code - Division Multiple Access (CDMA).

TEXT BOOKS:
1. Data Communication and Computer Networking - B. A.Forouzan, 3rd ed., 2008, TMH.
2. Advanced Electronic Communication Systems - W. Tomasi, 5 ed., 2008, PEI.
REFERENCES:
1. Data Communications and Computer Networks - Prakash C. Gupta, 2006, PHI.
2. Data and Computer Communications - William Stallings, 8th ed., 2007, PHI.
3. Data Communication and Tele Processing Systems - T. Housely, 2nd Edition, 2008, BSP.
4. Data Communications and Computer Networks- Brijendra Singh, 2nd ed., 2005, PHI.
5. Telecommunication System Engineering – Roger L. Freeman, 4/ed., Wiley-Interscience, John Wiley & Sons, 2004.

I Year -I Sem M.Tech. (CCE)

INTERNETWORKING

Unit -I:

Internetworking concepts: Principles of Internetworking, Connectionless Internetworking, Application level Interconnections, Network level Interconnection, Properties of thee Internet, Internet Architecture, Wired LANS, Wireless LANs, Point-to-Point WANs, Switched WANs, Connecting Devices, TCP/IP Protocol Suite.
IP Address: Classful Addressing: Introduction, Classful Addressing, Other Issues, Sub-netting and Super-netting
IP Address: Classless Addressing: - Variable length Blocks, Sub-netting, Address Allocation. Delivery, Forwarding, and Routing of IP Packets: Delivery, Forwarding, Routing, Structure of Router.
ARP and RARP: ARP, ARP Package, RARP.

Unit -II:

Internet Protocol (IP): Datagram, Fragmentation, Options, Checksum, IP V.6.
Transmission Control Protocol (TCP): TCP Services, TCP Features, Segment, A TCP Connection, State Transition Diagram, Flow Control, Error Control, Congestion Control, TCP Times.
Stream Control Transmission Protocol (SCTP): SCTP Services, SCTP Features, Packet Format, Flow Control, Error Control, Congestion Control.
Mobile IP: Addressing, Agents, Three Phases, Inefficiency in Mobile IP.
Classical TCP Improvements: Indirect TCP, Snooping TCP, Mobile TCP, Fast Retransmit/ Fast Recovery, Transmission/ Time Out Freezing, Selective Retransmission, Transaction Oriented TCP.

Unit -III:

Unicast Routing Protocols (RIP, OSPF, and BGP: Intra and Inter-domain Routing, Distance Vector Routing, RIP, Link State Routing, OSPF, Path Vector Routing, BGP.
Multicasting and Multicast Routing Protocols: Unicast - Multicast- Broadcast, Multicast Applications, Multicast Routing, Multicast Link State Routing: MOSPF, Multicast Distance Vector: DVMRP.

Unit -IV:

Domain Name System (DNS): Name Space, Domain Name Space, Distribution of Name Space, and DNS in the internet.
Remote Login TELNET:- Concept, Network Virtual Terminal (NVT). ***File Transfer FTP and TFTP:*** File Transfer Protocol (FTP). ***Electronic Mail:*** SMTP and POP.
Network Management-SNMP: Concept, Management Components. World Wide Web- HTTP Architecture.

Unit-V:
Multimedia: Digitizing Audio and Video, Network security, security in the internet firewalls. Audio and Video Compression, Streaming Stored Audio/Video, Streaming Live Audio/Video, Real-Time Interactive Audio/Video, RTP, RTCP, Voice Over IP. Network Security, Security in the Internet, Firewalls.

TEXT BOOKS:
1.   TCP/IP Protocol Suite- Behrouz A. Forouzan, Third Edition, TMH
2.   Internetworking with TCP/IP Comer 3 rd edition PHI

REFERENCES:
1.   High performance TCP/IP Networking- Mahbub Hassan, Raj Jain, PHI, 2005
2.   Data Communications & Networking – B.A. Forouzan – 2nd Edition – TMH
3.   High Speed Networks and Internets- William Stallings, Pearson Education, 2002.
4.   Data and Computer Communications, William Stallings, 7th Edition., PEI.

I Year -I Sem M.Tech. (CCE)

ADVANCED DIGITAL SIGNAL PROCESSING

UNIT I
Review of DFT, FFT, IIR Filters, FIR Filters,
Multirate Signal Processing: Introduction, Decimation by a factor D, Interpolation by a factor I, Sampling rate conversion by a rational factor I/D, Multistage Implementation of Sampling Rate Conversion, Filter design & Implementation for sampling rate conversion, Applications of Multirate Signal Processing

UNIT II
Non-Parametric methods of Power Spectral Estimation: Estimation of spectra from finite duration observation of signals, Non-parametric Methods: Bartlett, Welch & Blackman & Tukey methods, Comparison of all Non-Parametric methods

UNIT III
Parametric Methods of Power Spectrum Estimation: Autocorrelation & Its Properties, Relation between auto correlation & model parameters, AR Models - Yule-Waker & Burg Methods, MA & ARMA models for power spectrum estimation.

UNIT –IV
Linear Prediction : Forward and Backward Linear Prediction – Forward Linear Prediction, Backward Linear Prediction, Optimum reflection coefficients for the Lattice Forward and Backward Predictors. Solution of the Normal Equations: Levinson Durbin Algorithm, Schur Algorithm. Properties of Linear Prediction Filters

UNIT V
Finite Word Length Effects: Analysis of finite word length effects in Fixed-point DSP systems – Fixed, Floating Point Arithmetic – ADC quantization noise & signal quality – Finite word length effect in IIR digital Filters – Finite word-length effects in FFT algorithms.

TEXTBOOKS:

1. Digital Signal Processing: Principles, Algorithms & Applications - J.G.Proakis & D.G.Manolokis, 4th ed., PHI.
2. Discrete Time signal processing - Alan V Oppenheim & Ronald W Schaffer, PHI.
3. DSP – A Pratical Approach – Emmanuel C.Ifeacher, Barrie. W, Jervis, 2 ed., Pearson Education.

REFERENCES:

1. Modern spectral Estimation : Theory & Application – S. M .Kay, 1988, PHI.
2. Multirate Systems and Filter Banks – P.P.Vaidyanathan – Pearson Education
3. Digital Signal Processing – S.Salivahanan, A.Vallavaraj, C.Gnanapriya, 2000,TMH

I Year -I Sem M.Tech. (CCE)

IMAGE & VIDEO PROCESSING

UNIT 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), Wavelet Transforms: Continuous Wavelet Transform, Discrete Wavelet Transforms.

UNIT II Image Processing Techniques

Image Enhancement
Spatial domain methods: Histogram processing, Fundamentals of Spatial filtering, Smoothing spatial filters, Sharpening spatial filters.
Frequency domain methods: Basics of filtering in frequency domain, image smoothing, image sharpening, Selective filtering.
Image Segmentation
Segmentation concepts, Point, Line and Edge Detection, Thresholding, Region Based segmentation.

UNIT III Image Compression

Image compression fundamentals - Coding Redundancy, Spatial and Temporal redundancy, Compression models: Lossy & Lossless, Huffman coding, Arithmetic coding, LZW coding, Run length coding, Bit plane coding, Transform coding, Predictive coding, Wavelet coding, JPEG Standards.

UNIT IV Basic steps of Video Processing

Analog Video, Digital Video. Time-Varying Image Formation models: Three-Dimensional Motion Models, Geometric Image Formation, Photometric Image Formation, Sampling of Video signals, Filtering operations.

UNIT V 2-D Motion Estimation

Optical flow, General Methodologies, Pixel Based Motion Esimation, Block- Matching Algorithm, Mesh based Motion Estimation, Global Motion Estimation, Region based Motion Estimation, Multi resolution motion estimation, Waveform based coding, Block based transform coding, Predictive coding, Application of motion estimation in Video coding.

TEXTBOOKS
1.   Digital Image Processing – Gonzaleze and Woods, 3rd ed., Pearson.
2.   Video processing and communication – Yao Wang, Joem Ostermann and Ya–quin Zhang. 1st Ed., PH Int.

REFRENCES
1.   Digital Video Processing – M. Tekalp, Prentice Hall International

I Year -I Sem M.Tech. (CCE)

DETECTION & ESTIMATION THEORY
(ELECTIVE –I)

Unit – I
Introduction, Simple Binary Hypothesis Tests, M-Hypothesis, Estimation Theory, Composite Hypothesis, General Gaussian Problem, Performance Bounds and Approximations, Sampling of Bandlimited Random Signals, Periodic random Processes, Spectral Decomposition, Vector Random Processes.

Unit – II
Detection & Estimation of Signals in White Gaussian Noise and Non-White Gaussian Noise, Signals with unwanted Parameters, Multiple Channels and Multiple Parameter, Linear & Non-Linear estimates, MLP & ML Estimates, Maximum Likelihood Estimate of Parameters of Linear Systems

Unit – III
Minimum Probability Error Criterion, Neyman-Pearson Criterion for Radar detection of Constant and variable amplitude signals, Matched Filters, Optimum formulation, Detection of Random Signals, Simple Problems there on with Multisample cases.

Unit – IV
Estimation of Continuous Waveforms: Derivation of Estimator Equations, A Lower Bound on the Mean Square Estimation Error, Multi dimensional Waveform Estimation, Nonrandom Waveform estimation.

Unit – V
Estimation of Time varying Signals – Kalman Filtering, Filtering Signals in Noise treatment,
Restricted to two variable case only- simple Problems, Realizable Linear Filters, Kalman Bucy Filters, Fundamental role of Optimum Linear Filters.

TEXT BOOKS:

1.   Detection, Estimation and Modulation Theory: Part – I – Harry L. Van Trees, 2001, John Wiley & Sons, USA.
2.   Signal Processing : Discrete Spectral Analysis – Detection & Estimation – Mischa Schwartz, Leonard Shaw, 1975, McGrawHill.

REFERENCE BOOKS:

1.   Fundamentals of Statistical Signal Processing: Volume I Estimation Theory– Steven.M.Kay, Prentice Hall, USA, 1998.
2.   Fundamentals of Statistical Signal Processing: Volume I Detection Theory– Steven.M.Kay, Prentice Hall, USA, 1998.
3.   Introduction to Statistical Signal Processing with Applications - Srinath, Rajasekaran, Viswanathan, 2003, PHI.
4.   Statistical Signal Processing: Detection, Estimation and Time Series Analysis – Louis L.Scharf, 1991, Addison Wesley.
5.   Random Signals : Detection, Estimation and Data Analysis – K.Sam Shanmugam, Arthur M Breiphol, 1998, John Wiley & Sons.

I Year -I Sem M.Tech. (CCE)

CPLD AND FPGA ARCHITECTURE AND APPLICATIONS
(ELECTIVE –I)

UNIT –I
Programmable logic : ROM, PLA, PAL PLD, PGA – Features, programming and applications using complex programmable logic devices Altera series – Max 5000/7000 series and Altera FLEX logic-10000 series CPLD, AMD's- CPLD (Mach 1to 5), Cypres FLASH 370 Device technology, Lattice PLST's architectures – 3000 series – Speed performance and in system programmability.

UNIT – II
FPGAs: Field Programmable gate arrays- Logic blocks, routing architecture, design flow technology mapping jfor FPGAs, Case studies Xitir x XC4000 & ALTERA's FLEX 8000/10000 FPGAs: AT &T ORCA's (Optimized Reconfigurable Cell Array): ACTEL's ACT-1,2,3 and their speed performance

UNIT-III
Alternative realization for state machine chat suing microprogramming linked state machine one –hot state machine, petrinetes for state machines-basic concepts, properties, extended petrinetes for parallel controllers.

UNIT-IV
Digital front end digital design tools for FPGAs& ASICs: Using mentor graphics EDA tool ("FPGA Advantage") – Design flow using FPGAs

UNIT - V
Case studies of paraller adder cell paraller adder sequential circuits, counters, multiplexers, parellel controllers.

TEXT BOOKS:
1.   Field Programmable Gate Array Technology - S. Trimberger, Edr, 1994, Kluwer Academic Publications.
2.   Field Programmable Gate Arrays, John V.Oldfield, Richard C Dore, Wiley Publications.

 REFERENCES :

1.   Digital Design Using Field Programmable Gate Array, P.K.Chan & S. Mourad, 1994, Prentice Hall.
2.   Digital System Design using Programmable Logic Devices – Parag.K.Lala, 2003, BSP.
3.   Field programmable gate array, S. Brown, R.J.Francis, J.Rose ,Z.G.Vranesic, 2007, BSP.
4.   Digital Systems Design with FPGA's and CPLDs – Ian Grout, 2009, Elsevier.

I Year -I Sem M.Tech. (CCE)

ARTIFICIAL INTELLIGENCE
(ELECTIVE- I)

UNIT-I

Introduction : AI problems, foundation of AI and history of AI intelligent agents:

Agents and Environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation.

Searching: Searching for solutions, uniformed search strategies – Breadth first search, depth first search, Depth limited search, Iterative deepening depth first search bi-direction search - comparison. Search with partial information (Heuristic search) Greedy best first search, A* search, Memory bounded heuristic search, Heuristic functions.

UNIT-II

Local search Algorithms, Hill climbing, simulated, annealing search, local beam search, genetical algorithms. Constrain satisfaction problems: Backtracking search for CSPs local search for constraint satisfaction problems.

Game Playing: Adversial search, Games, minimax, algorithm, optimal decisions in multiplayer games, Alpha-Beta pruning, Evaluation functions, cutting of search.

UNIT-III

Knowledge Representation & Reasons logical Agents, Knowledge – Based Agents, the Wumpus world, logic, propositional logic, Resolution patterns in propos ional logic, Resolution, Forward & Backward. Chaining.

First order logic. Inference in first order logic, propositional Vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution.

UNIT-IV

Planning – Classical planning problem, Language of planning problems,

Expressiveness and extension, planning with state – space search, Forward states spare search, Backward states space search, Heuristics for stats space search. Planning search, planning with state space search, partial order planning Graphs.

UNIT-V

Learning – Forms of learning, Induction learning, Learning Decision Tree, Statistical learning methods, learning with complex data, learning with Hidden variables – The EM Algorithm, Instance Based learning, Neural Networks.

TEXT BOOKS:

1. Artificial Intelligence – A Modern Approach. Second Edition, Stuart Russel,
Peter Norvig, PHI/Pearson Education.
2. Artificial Intelligence, 3rd Edition, Patrick Henry Winston., Pearson Edition,

Reference:

1. Artificial Intelligence , 2nd Edition, E.Rich and K.Knight (TMH).
2. Artificial Intelligence and Expert Systems – Patterson PHI
3. Expert Systems: Principles and Programming- Fourth Edn, Giarrantana/ Riley, Thomson
4. PROLOG Programming for Artificial Intelligence. Ivan Bratka- Third Edition
– Pearson Education.

I Year -I Sem M.Tech. (CCE)

VOICE OVER INTERNET PROTOCOL (VoIP)
(ELECTIVE- II)

Unit – I: Overview of IP Protocol Suite

The Internet Protocol, The Transmission Control Protocol(TCP), The User Datagram Protocol (UDP), The Real-time Transport Protocol (RTP), IP multicast, IP version 6 (IP v6), Interworking IPv4 and IPv6, The VoIP Market, VoIP Challenges.

Unit - II: H.323 and H.245 Standards

The H.323 Architecture, Call Signaling-Call Scenarios, H.245 Control Signaling Conference calls- The Decomposed Gateway.

Unit – III: The Session Initiation Protocol (SIP)

SIP architecture- Overview of SIP Messaging Syntax- Examples of SIP Message sequences- Redirect Servers-Proxy Servers. The Session Description Protocol (SDP)- Usage of SDP With SIP.

Unit-IV: Quality of Service (QoS)

Need for QOS – End-to-end QoS, Overview of QOS solutions- The Resource reservation Protocol(RSVP)-Diffserv- The Diffserv Architecture- Multi-protocol Label Switching (MPLS)- The MPLS Architecture- MPLS Traffic Engineering- Label Distribution Protocols and Constraint- Based Routing.

Unit-V: *VoIP and SS7*

The SS7 Protocol Suite- The Message Transfer Part (MTP), ISDN User Part (ISUP) and Signaling Connection Control Part (SCCP), SS7 Network Architecture- Signaling Points(SPs)- Single Transfer Point (STP), - Service Control Point(SCP)- Message Signal Units (MSUs)- SS7 Addressing, ISUP, Performance Requirements for SS7, Sigtran- Sigtran Architecture- SCTP- M3UA Operation- M2UA Operation- M2PA Operation- Interworking SS7 and VoIP Architectures- Interworking Soft switch and SS7- Interworking H.323 and SS7.

Text Books:
1. Carrier Grade Voice over IP – Daniel Collins, 2nd ed., TMH.

I Year -I Sem M.Tech. (CCE)

SATELLITE COMMUNICATIONS
(ELECTIVE- II)

Unit-1 Communication Satellite: Orbit and Description
A Brief history of satellite Communication, Satellite Frequency Bands, Satellite Systems,
Applications, Orbital Period and Velocity, effects of Orbital Inclination, Azimuth and Elevation, Coverage angle and slant Range, Eclipse, Orbital Perturbations, Placement of a Satellite in a Geo-Stationary orbit.

Unit-2: **Satellite Sub-Systems**
Attitude and Orbit Control system, TT&C subsystem, Attitude Control subsystem, Power systems, Communication subsystems, Satellite Antenna Equipment.

Unit-3: **Satellite Link**
Basic Transmission Theory, System Noise Temperature and G/T ratio, Basic Link Analysis, Interference Analysis, Design of satellite Links for a specified C/N, (With and without frequency Re-use).

Unit-4 Propagation effects
Introduction, Atmospheric Absorption, Cloud Attenuation, Tropospheric and Ionospheric Scintillation and Low angle fading, Rain induced attenuation, rain induced cross polarization interference.

Unit-5 Frequency Division Multiple Access
FDM-FM-FDMA, Single channel per carrier, Companded FDM-FM-FDMA and SSB-AM-FDMA, Intermodulation Products due to Amplitude Non-Linearity and Phase non-linearities, Optimized Carrier to Intermodulation plus noise ratio.

Unit-6 Time Division Multiple Access
TDMA frame Structure, Burst Structure, Frame Efficiency, Super frame structure, Frame Acquisition and Synchronization, Burst Time Plan, TDMA timing, TDMA equipment and Advanced TDMA satellite systems.

Unit-7 Demand Assignment Multiple Access
Types of Demand Assignments, DAMA characteristics, Real –Time Frame Configuration, DAMA interfaces, SCPC-DAMA, SPADE.

Unit-8 Satellite Packet Communications:
Message Transmission by FDMA:M/G/1 Queue, Message Transmission by TDMA,
PURE ALOHA-Satellite Packet Switching, Slotted Aloha, Packet Reservation,Tree Algorithm.

TEXT BOOKS:
1. Digital Satellite Communications-Tri.T.Ha, , 2nd Edition, 1990, Mc.Graw Hill.
2.Satellite Communications –Timothy Pratt, Charles Bostian, Jeremy Allnutt, 2nd Edition, 2003,John Wiley & Sons.

REFERENCES

1. Satellite Communications-Dennis Roddy, 2nd Edition, 1996, Mc-Graw Hill.

I Year -I Sem M.Tech. (CCE)

MICROCONTROLLERS FOR EMBEDDED SYSTEM DESIGN
(ELECTIVE- II)

Unit – I: Introduction to Embedded Systems
Overview of Embedded Systems, Processor Embedded into a system, Embedded Hardware Units and Devices in system, Embedded Software, Complex System Design, Design Process in Embedded System, Formalization of System Design, Classification of Embedded Systems.

Unit – II: Microcontrollers and Processor Architecture & Interfacing
8051 Architecture, Input/Output Ports and Circuits, External Memory, Counters and Timers, PIC Controllers. Interfacing Processor (8051, PIC), Memory Interfacing, I/O Devices, Memory Controller and Memory arbitration Schemes.

Unit – III: Embedded RISC Processors & Embedded System-on Chip Processor
PSOC (Programmable System-on-Chip) architectures, Continuous Timer blocks, Switched Capacitor blocks, I/O blocks, Digital blocks, Programming of PSOC, Embedded RISC Processor architecture – ARM Processor architecture, Register Set, Modes of operation and overview of Instructions

Unit – IV: Interrupts & Device Drivers
Exceptions and Interrupt handling Schemes – Context & Periods for Context Switching, Deadline & interrupt latency. Device driver using Interrupt Service Routine, Serial port Device Driver, Device drivers for Internal Programmable timing devices

Unit – V: Network Protocols
Serial communication protocols, Ethernet Protocol, SDMA, Channel & IDMA, External Bus Interface

TEXT BOOKS:

1. Embedded Systems - Architecture Programming and Design – Raj Kamal, 2nd ed., 2008,TMH.
1. PIC Microcontroller and Embedded Systems – Muhammad Ali Mazidi, Rolin D.Mckinaly, Danny Causy – PE.
2. Designers Guide to the Cypress PSOC – Robert Ashpy, 2005, Elsevier.

REFERENCES:
1. Embedded Microcomputer Systems, Real Time Interfacing – Jonathan W. Valvano – Brookes / Cole, 1999, Thomas Learning.
2. ARM Systems Developers Guides- Design & Optimizing System Software - Andrew N. Sloss, Dominic Symes, Chris Wright, 2004, Elsevier.
3. Designing with PIC Microcontrollers- John B. Peatman, 1998, PH Inc.

I Year -I Sem M.Tech. (CCE)

SIMULATION LAB (COMMUNICATION LAB)

Note:
 A.   Minimum of 10 Experiments have to be conducted
 B.   All Experiments may be Simulated using MATLAB and to be verified using related training kits.

1.   Implementation of Matched Filters.
2.   Optimum receiver for the AWGN channel.
3.   Design FIR (LP/HP/BP) filter using Window method.
4.   Measurement of effect of Intersymbol Interference.
5.   Generation of constant envelope PSK signal wave form for different values of M.
6.   Simulation of PSK system with M=4
7.   Simulation of DPSK system with M=4
8.   Design of FSK system
9.   Simulation of correlation type demodulation for FSK signal
10.   BPSK Modulation and Demodulation techniques
11.   QPSK Modulation and Demodulation techniques
12.   DQPSK Modulation and Demodulation techniques
13.   8-QAM Modulation and Demodulation techniques
14.   DQAM Modulation and Demodulation techniques
15.   Verification of Decimation and Interpolation of a given signal
16.   Power spectrum estimation using AR models