

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.TECH IN COMMUNICATION SYSTEMS

**EFFECTIVE FROM ACADEMIC YEAR 2017- 18 ADMITTED BATCH
COURSE STRUCTURE AND SYLLABUS**

I Semester

Category	Course Title	Int. marks	Ext. marks	L	T	P	C
PC-1	Spread Spectrum Communications	25	75	4	0	0	4
PC-2	Wireless Communications and Networks	25	75	4	0	0	4
PC-3	Advanced Data Communications	25	75	4	0	0	4
PE-1	Detection and Estimation Theory Advanced Digital Signal Processing Radio Navigational Aids	25	75	3	0	0	3
PE-2	TCP/IP Internetworking Cognitive Radio Networks Radar Systems Engineering	25	75	3	0	0	3
OE-1	*Open Elective – I	25	75	3	0	0	3
Laboratory I	Advanced Data Communications Lab	25	75	0	0	3	2
Seminar I	Seminar - I	100	0	0	0	3	2
Total		275	525	21	0	6	25

II Semester

Category	Course Title	Int. marks	Ext. marks	L	T	P	C
PC-4	Coding Theory and Techniques	25	75	4	0	0	4
PC-5	Advanced Communications and Networks	25	75	4	0	0	4
PC-6	3G Networks	25	75	4	0	0	4
PE-3	Wireless LANs and PANs Wireless MIMO Communications Adhoc Wireless Networks	25	75	3	0	0	3
PE4	Network Security And Cryptography Optical Communications and Networks Multimedia and signal coding	25	75	3	0	0	3
OE-2	*Open Elective – II	25	75	3	0	0	3
Laboratory II	Advanced Communications and Networks Lab	25	75	0	0	3	2
Seminar II	Seminar - II	100	0	0	0	3	2
Total		275	525	21	0	6	25

III Semester

Course Title	Int. marks	Ext. marks	L	T	P	C
Technical Paper Writing	100	0	0	3	0	2
Comprehensive Viva-Voce	0	100	0	0	0	4
Project work Review II	100	0	0	0	22	8
Total	200	100	0	3	22	14

IV Semester

Course Title	Int. marks	Ext. marks	L	T	P	C
Project work Review III	100	0	0	0	24	8
Project Evaluation (Viva-Voce)	0	100	0	0	0	16
Total	100	100	0	0	24	24

*Open Elective subjects must be chosen from the list of open electives offered by **OTHER** departments.

For Project review I, please refer 7.10 in R17 Academic Regulations.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M. TECH. I YEAR II SEMESTER COMMUNICATION SYSTEMS

CODING THEORY AND TECHNIQUES (PC - 4)

UNIT – I

Coding for Reliable Digital Transmission and storage: Mathematical model of Information, A Logarithmic Measure of Information, Average and Mutual Information and Entropy, Types of Errors, Error Control Strategies.

Linear Block Codes: Introduction to Linear Block Codes, Syndrome and Error Detection, Minimum Distance of a Block code, Error-Detecting and Error-correcting Capabilities of a Block code, Standard array and Syndrome Decoding, Probability of an undetected error for Linear Codes over a BSC, Hamming Codes. Applications of Block codes for Error control in data storage system

UNIT - II

Cyclic Codes : Description, Generator and Parity-check Matrices, Encoding, Syndrome Computation and Error Detection, Decoding ,Cyclic Hamming Codes, Shortened cyclic codes, Error-trapping decoding for cyclic codes, Majority logic decoding for cyclic codes.

UNIT – III

Convolutional Codes: Encoding of Convolutional Codes, Structural and Distance Properties, maximum likelihood decoding, Sequential decoding, Majority- logic decoding of Convolution codes. Application of Viterbi Decoding and Sequential Decoding, Applications of Convolutional codes in ARQ system.

UNIT – IV

Turbo Codes: LDPC Codes- Codes based on sparse graphs, Decoding for binary erasure channel, Log-likelihood algebra, Brief propagation, Product codes, Iterative decoding of product codes, Concatenated convolutional codes- Parallel concatenation, The UMTS Turbo code, Serial concatenation, Parallel concatenation, Turbo decoding

UNIT - V

Space-Time Codes: Introduction, Digital modulation schemes, Diversity, Orthogonal space- Time Block codes, Alamouti's schemes, Extension to more than Two Transmit Antennas, Simulation Results, Spatial Multiplexing : General Concept, Iterative APP Preprocessing and Per-layer Decoding, Linear Multilayer Detection, Original BLAST Detection, QL Decomposition and Interface Cancellation, Performance of Multi – Layer Detection Schemes, Unified Description by Linear Dispersion Codes.

TEXT BOOKS:

1. Shu Lin, Daniel J. Costello, Jr, "Error Control Coding- Fundamentals and Applications", Prentice Hall, Inc.
2. Man Young Rhee, "Error Correcting Coding Theory", 1989, McGraw-Hill

REFERENCE BOOKS:

1. Bernard Sklar, "Digital Communications-Fundamental and Application", PE.
2. John G. Proakis, "Digital Communications", 5th Edition, 2008, TMH.
3. Salvatore Gravano, "Introduction to Error Control Codes", Oxford
4. Todd K. Moon, "Error Correction Coding – Mathematical Methods and Algorithms", 2006, Wiley India.
5. Ranjan Bose, "Information Theory, Coding and Cryptography", 2nd Edition, 2009, TMH.

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ADVANCED COMMUNICATIONS AND NETWORKS (PC- 5)

UNIT - I

Spread Spectrum Communications: Spreading sequences- Properties of Spreading Sequences, Pseudo- noise sequence, Gold sequences, Kasami sequences, Walsh Sequences, Orthogonal Variable Spreading Factor Sequences, Barker Sequence, Complementary Codes

Direct sequence spread spectrum: DS-CDMA Model, Conventional receiver, Rake Receiver, Synchronization in CDMA, Power Control, Soft handoff, Multiuser detection – Optimum multiuser detector, Linear multiuser detection.

UNIT - II

Orthogonal Frequency Division Multiplexing: Basic Principles of Orthogonality, Single vs Multicarrier Systems, OFDM Block Diagram and Its Explanation, OFDM Signal Mathematical Representation, Selection parameter for Modulation, Pulse shaping in OFDM Signal and Spectral Efficiency, Window in OFDM Signal and Spectrum, Synchronization in OFDM, Pilot Insert in OFDM Transmission and Channel Estimation, Amplitude Limitations in OFDM, FFT Point Selection Constraints in OFDM, CDMA vs OFDM, Hybrid OFDM.

UNIT - III

MIMO Systems: Introduction, Space Diversity and System Based on Space Diversity, Smart Antenna system and MIMO, MIMO Based System Architecture, MIMO Exploits Multipath, Space – Time Processing, Antenna Consideration for MIMO, MIMO Channel Modelling, MIMO Channel Measurement, MIMO Channel Capacity, Cyclic Delay Diversity (CDD), Space Time Coding, Advantages and Applications of MIMO in Present Context, MIMO Applications in 3G Wireless System and Beyond, MIMO-OFDM

UNIT - IV

Wireless LANs/IEEE 802.11x: Introduction to IEEE802.11x Technologies, Evolution of wireless LANs, IEEE 802.11 Design Issues, IEEE 802.11 Services, IEEE 802.11 MAC Layer operations, IEEE 802.11 Layer1, IEEE 802.11 a/b/g Higher Rate Standards, Wireless LAN Security, Computing Wireless Technologies, Typical WLAN Hardware

UNIT - V

Wireless PANs/IEEE 802.15x: Introduction to IEEE 802.15x Technologies: Wireless PAN Applications and Architecture, IEEE 802.15.1 Physical Layer Details, Bluetooth Link Controllers Basics, Bluetooth Link Controllers Operational States, IEEE 802.15.1 Protocols and Host Control Interface. Evaluation of IEEE 802.15 Standards

Broad Band Wireless MANs/IEEE 802.16x: Introduction to WMAN/IEEE 802.16x Technology, IEEE 802.16 Wireless MANs, IEEE 802.16 MAC Layer Details, IEEE 802.16 Physical Layer Details, IEEE 802.16 Physical Layer Details for 2-11 GHz, IEEE 802.16 Common System Operations.

TEXT BOOKS:

1. Gary J. Mullett, "Introduction to Wireless Telecommunications Systems and Networks", CENGAGE
2. Upena Dalal, "Wireless Communication", Oxford University Press, 2009

REFERENCES:

1. Ke-Lin Du & M N S Swamy, "Wireless Communication System", Cambridge University Press, 2010
2. Gottapu Sasibhusan Rao, "Mobile Cellular Communication", PEARSON

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3G NETWORKS (PC - 6)

UNIT - I

GSM Fundamentals: General Architecture, Mobility Management, GSM Air Interface, Timing Advance, Initial Connection Procedure, Protocols and Signaling, GSM and Signaling Systems.

General Packet Radio Service: General Architecture, GPRS Network Elements, Network Interfaces, GPRS Air Interface, GPRS Protocols.

UNIT - II

Introduction: Second Generation Mobile Networks, 2.5 Generation Mobile Networks, International Mobile, Third Generation Partnership Program (3GPP)

Principles of WCDMA: Requirements for 3rd Generation Air Interface, Schemes for Radio Access, WCDMA Overview, Spreading and De-Spreading, Scrambling, Rake Receiver,

UNIT - III

UMTS Network Architecture: Basic Structure of UMTS Network, Access Stratum and Non-access Stratum, Hierarchical Network Organization, Addresses and Identifiers, Service Aspects, Service Classification, Quality of Service (QoS) Architecture, UMTS QoS Classes.

User Equipment: Components of User Equipment, Interfaces of User Equipment, UE Functions, UE Protocols, Classification of UE.

Access Network: Access Network Entities, Network Interfaces, Radio Interface Protocol Architecture, UTRAN Protocol Architecture, Functions.

UNIT - IV

Core Network: Entities Common to CS and PS Domain, Entities Specific to CS Domain, Entities Specific to the PS Domain, Service Specific Entities of the Core Network, CS Domain Protocol Architecture, PS Domain Protocol Architecture, Core Network Functions.

UNIT - V

IP Applications for GPRS/UMTS : IP Protocol Suite Overview, IP Routing, TCP and Congestion Control, TCP Optimization for the Air, IP for GPRS and UMTS R99, IP based QoS for UMTS Networks.

TEXT BOOKS:

1. Jeffrey Bannister, Paul Mather, Sebastian Coope, "Convergence Technologies for 3G Networks- IP, UMTS, EGPRS and ATM", John Wiley & Sons.
2. Sumith Kaseara, Nishit Narang, "3G Networks Architecture, Protocols and Procedures", Tata McGraw Hill

REFERENCE BOOKS:

1. Clint Smith, Daniel Collins, "3G wireless Networks ", McGraw Hill, 2002.
2. Zheng , "Wireless Networking complete", ISBN 9789351071563, First Indian reprint 2014., Elsevier publication
3. Hendrik Berndt, "Towards 4G Technologies: Services with Initiative", John Wiley & Sons
4. Savo G. Glisic , "Advanced Wireless Networks: 4G Technologies", John Wiley & Sons

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WIRELESS LANs AND PANs (PE - 3)

UNIT – I

Wireless System & Random Access Protocols: Introduction, First and Second Generation Cellular Systems, Cellular Communications from 1G to 3G, Wireless 4G systems, The Wireless Spectrum; Random Access Methods: Pure ALOHA, Slotted ALOHA, Carrier Sense Multiple Access (CSMA), Carrier Sense Multiple Access with Collision Detection (CSMA/CD), Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA).

UNIT – II

Wireless LANs: Introduction, importance of Wireless LANs, WLAN Topologies, Transmission Techniques: Wired Networks, Wireless Networks, comparison of wired and Wireless LANs; WLAN Technologies: Infrared technology, UHF narrowband technology, Spread Spectrum technology

UNIT – III

The IEEE 802.11 Standard for Wireless LANs: Network Architecture, Physical layer, The Medium Access Control Layer; MAC Layer issues: Hidden Terminal Problem, Reliability, Collision avoidance, Congestion avoidance, Congestion control, Security, The IEEE 802.11e MAC protocol

UNIT – IV

Wireless PANs: Introduction, importance of Wireless PANs, The Bluetooth technology: history and applications, technical overview, the Bluetooth specifications, piconet synchronization and Bluetooth clocks, Master-Slave Switch; Bluetooth security; Enhancements to Bluetooth: Bluetooth interference issues, Intra and Inter Piconet scheduling, Bridge selection, Traffic Engineering, QoS and Dynamics Slot Assignment, Scatternet formation.

UNIT – V

The IEEE 802.15 working Group for WPANs: The IEEE 802.15.3, The IEEE 802.15.4, ZigBee Technology, ZigBee components and network topologies, The IEEE 802.15.4 LR-WPAN Device architecture: Physical Layer, Data Link Layer, The Network Layer, Applications; IEEE 802.15.3a Ultra wideband.

TEXT BOOKS:

1. Carlos de Morais Cordeiro and Dharma Prakash Agrawal, "Ad Hoc and Sensor Networks", World Scientific, 2011.
2. Vijay K. Garg, "Wireless Communications and Networking", Morgan Kaufmann Publishers, 2009.

REFERENCE BOOKS:

1. Kaveh Pahlaram, Prashant Krishnamurthy, "Wireless Networks", PHI, 2002.
2. Marks Ciampor, George Olenewa, "Wireless Communication", Cengage Learning, 2007.

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WIRELESS MIMO COMMUNICATIONS (PE - 3)

UNIT - I

Fading Channels and Diversity Techniques: Wireless channels – Error/Outage probability over fading channels – Diversity techniques – Channel coding as a means of time diversity – Multiple antennas in wireless communications.

UNIT - II

Capacity and Information Rates of MIMO Channels: Capacity and Information rates of noisy, AWGN and fading channels – Capacity of MIMO channels – Capacity of non-coherent MIMO channels – Constrained signaling for MIMO communications.

UNIT - III

Space-Time Block and Trellis Codes: Transmit diversity with two antennas: The Alamouti scheme – Orthogonal and Quasi-orthogonal space-time block codes – Linear dispersion codes – Generic space-time trellis codes – Basic space-time code design principles – Representation of space-time trellis codes for PSK constellation – Performance analysis for space-time trellis codes – Comparison of space-time block and trellis codes.

UNIT - IV

Concatenated Codes and Iterative Decoding: Development of concatenated codes – Concatenated codes for AWGN and MIMO channels – Turbo coded modulation for MIMO channels – Concatenated space-time block coding.

UNIT - V

Space-Time Coding for Frequency Selective Fading Channels: MIMO frequency-selective channels – Capacity and Information rates of MIMO FS fading channels.– Space-time coding and Channel detection for MIMO FS channels – MIMO OFDM systems.

TEXT BOOKS:

1. Tolga M. Duman and Ali Ghrayeb, "Coding for MIMO Communication systems", John Wiley & Sons, West Sussex, England, 2007.
2. A. B. Gershman and N.D. Sidiropoulos, "Space-time processing for MIMO Communications", Wiley, Hoboken, NJ, USA, 2005.

REFERENCES:

1. E.G. Larsson and P. Stoica, "Space-time block coding for Wireless communications", Cambridge University Press, 2003.
2. M. Janakiraman, "Space-time codes and MIMO systems", Artech House, 2004.
3. H. Jafarkhani, "Space-time coding: Theory & Practice", Cambridge University Press, 2005.

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ADHOC WIRELESS NETWORKS (PE - 3)

UNIT - I

Wireless Local Area Networks: Introduction, wireless LAN Topologies, Wireless LAN Requirements, Physical Layer- Infrared Physical Layer, Microwave based Physical Layer Alternatives, Medium Access Control Layer- HIPERLAN 1 Sublayer, IEEE 802.11 MAC Sublayer and Latest Developments-802.11a, 802.11b, 802.11g

Personal Area Networks: Introduction to PAN technology and Applications, Bluetooth - specifications, Radio Channel, Piconets and Scatternets, Inquiry, Paging and Link Establishment, Packet Format, Link Types, Power Management, Security, Home RF -Physical and MAC Layer

UNIT - II

MAC Protocols: Introduction, Issues in Designing a MAC protocol for Ad Hoc Wireless Networks, Design goals of a MAC Protocol for Ad Hoc Wireless Networks, Classifications of MAC Protocols, Contention - Based Protocols, Contention - Based Protocols with reservation Mechanisms, Contention - Based MAC Protocols with Scheduling Mechanisms, MAC Protocols that use Directional Antennas, Other MAC Protocols.

UNIT - III

Routing Protocols: Introduction, Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks, Classification of Routing Protocols, Table -Driven Routing Protocols, On - Demand Routing Protocols, Hybrid Routing Protocols, Routing Protocols with Efficient Flooding Mechanisms, Hierarchical Routing Protocols, Power - Aware Routing Protocols.

UNIT - IV

Transport Layer Protocols: Introduction, Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks, Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer Solutions, TCP Over Ad Hoc Wireless Networks, Other Transport Layer Protocol for Ad Hoc Wireless Networks.

UNIT - V

Quality of Service in Ad Hoc Wireless Networks: Introduction, Real Time Traffic Support in Ad Hoc Wireless Networks, QoS Parameters in Ad Hoc Wireless Network, Issues and Challenges in providing QoS in Ad Hoc Wireless Networks, Classification of QoS Solutions: MAC Layer Solutions, Cluster TDMA, IEEE 802.11e, DBASE, Network Layer Solutions, QoS Routing Protocols, Ticket Based QoS Routing Protocol, Predictive Location Based QoS routing protocol, Trigger Based Distributed QoS Routing Protocol, QoS enabled AODV Routing Protocol, Bandwidth QoS Routing Protocol, On Demand QoS Routing Protocol, On Demand Link-State Multipath QoS Routing Protocol, Asynchronous Slot Allocation Strategies. QoS Frameworks for Ad Hoc Wireless Networks.

TEXT BOOKS:

1. C. Siva Ram Murthy and B. S. Manoj, "Ad Hoc Wireless Networks: Architectures and Protocols", 2004, PHI.
2. P Nicopolitidis and M S Obaidat, "Wireless Networks", Wiley India Edition, 2003.

REFERENCE BOOKS:

1. Roy Blake, "Wireless Communication Technology", CENGAGE, 2012
2. Jagannathan Sarangapani, "Wireless Ad- hoc and Sensor Networks: Protocols, Performance, and Control "CRC Press.

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NETWORK SECURITY AND CRYPTOGRAPHY (PE - 4)

UNIT - I

Introduction: Attacks, Services, and Mechanisms, Security attacks, Security services, A Model for Internetwork security.

Classical Techniques: Conventional Encryption model, Steganography, Classical Encryption Techniques.

Modern Techniques: Simplified DES, Block Cipher Principles, Data Encryption standard, Strength of DES, Differential and Linear Cryptanalysis, Block Cipher Design Principles and Modes of operations.

UNIT - II

Encryption Algorithms: Triple DES, International Data Encryption algorithm, Blowfish, RC5, CAST-128, RC2, Characteristics of Advanced Symmetric block ciphers.

Conventional Encryption: Placement of Encryption function, Traffic confidentiality, Key distribution, Random Number Generation.

UNIT - III

Public Key Cryptography: Principles, RSA Algorithm, Key Management, Diffie-Hellman Key exchange, Elliptic Curve Cryptography.

Number Theory: Prime and Relatively prime numbers, Modular arithmetic, Fermat's and Euler's theorems, Testing for primality, Euclid's Algorithm, the Chinese remainder theorem, Discrete logarithms.

UNIT - IV

Message Authentication and Hash Functions: Authentication requirements and functions, Message Authentication, Hash functions, Security of Hash functions and MACs.

Hash and Mac Algorithms: MD File, Message digest Algorithm, Secure Hash Algorithm, RIPEMD-160, HMAC.

Digital signatures and Authentication protocols: Digital signatures, Authentication Protocols, Digital signature standards.

Authentication Applications: Kerberos, X.509 directory Authentication service.

Electronic Mail Security: Pretty Good Privacy, S/MIME.

UNIT - V

IP Security: Overview, Architecture, Authentication, Encapsulating Security Payload, Combining security Associations, Key Management. Web Security: Web Security requirements, Secure sockets layer and Transport layer security, Secure Electronic Transaction.

Intruders, Viruses and Worms: Intruders, Viruses and Related threats.

Fire Walls: Fire wall Design Principles, Trusted systems.

TEXT BOOKS:

1. William Stallings, "Cryptography and Network Security: Principles and Practice", Pearson Education.
2. William Stallings, "Network Security Essentials (Applications and Standards)", Pearson Education.

REFERENCE BOOKS:

1. Eric Maiwald, "Fundamentals of Network Security", Dreamtech Press

2. Charlie Kaufman, Radia Perlman and Mike Speciner," Network Security - Private Communication in a Public World", Pearson/PHI.
3. Whitman, "Principles of Information Security", Thomson.
4. Robert Bragg, Mark Rhodes, " Network Security: The complete reference", TMH
5. Buchmann," Introduction to Cryptography", Springer.

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OPTICAL COMMUNICATIONS AND NETWORKS (PE - 4)

UNIT - I

Optical Fibers: Structures, waveguiding and Fabrication- Nature of Light, Basic optical laws and definitions, Single mode fibers, Graded index fiber structure, Attenuation, Signal Dispersion in fibers.

Optical Sources- LEDs, Laser Diodes, Line Coding.

UNIT - II

Photodetectors - Photodetector Noise, Detector Response Time, Avalanche Multiplication Noise.

Optical Receiver Operation- Fundamental receiver operation, Digital receiver performance, Eye diagrams.

WDM Concepts and Components- Passive optical Couplers, Isolators, and Circulators

UNIT - III

Digital Links- Point to point links, power penalties, error control, Coherent detection, Differential Quadrature Phase Shift Keying.

Analog Links- Carrier to noise ration, Multichannel Transmission Techniques, RF over Fiber, Radio over fiber links, Microwave Photonics.

UNIT - IV

Optical Networks – Network Concepts, Network Topologies, SONET/SDH, High speed lightwave links, Optical add/ Drop Multiplexing, Optical Switching, WDM Network, Passive Optical Networks, IP Over DWDM, Optical Ethernet, Mitigation of Transmission Impairments

UNIT - V

Performance Measurement and Monitoring- Measurement standards, Basic Test Equipment, Optical power measurement, Optical fiber characterization, Eye diagram tests, optical time domain reflectometer, optical performance monitoring, optical fiber system performance measurements.

TEXTBOOK

1. Gerd Keiser, "Optical Fiber Communications", 5th Edition, Mc Graw Hill.

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MULTIMEDIA AND SIGNAL CODING (PE - 4)

UNIT - I

Introduction to Multimedia: Multimedia, World Wide Web, Overview of Multimedia Tools, Multimedia Authoring, Graphics/ Image Data Types, and File Formats.

Color in Image and Video: Color Science – Image Formation, Camera Systems, Gamma Correction, Color Matching Functions, CIE Chromaticity Diagram, Color Monitor Specifications, Out-of-Gamut Colors, White Point Correction, XYZ to RGB Transform, Transform with Gamma Correction, L*A*B* Color Model. Color Models in Images – RGB Color Model for CRT Displays, Subtractive Color: CMY Color Model, Transformation from RGB to CMY, Under Color Removal: CMYK System, Printer Gamuts, Color Models in Video – Video Color Transforms, YUV Color Model, YIQ Color Model, Ycbcr Color Model.

UNIT - II

Video Concepts: Types of Video Signals, Analog Video, Digital Video.

Audio Concepts: Digitization of Sound, Quantization and Transmission of Audio.

UNIT - III

Compression Algorithms

Lossless Compression Algorithms: Run Length Coding, Variable Length Coding, Arithmetic Coding, Lossless JPEG, Image Compression.

Lossy Image Compression Algorithms: Transform Coding: KLT And DCT Coding, Wavelet Based Coding.

Image Compression Standards: JPEG and JPEG2000.

UNIT - IV

Video Compression Techniques: Introduction to Video Compression, Video Compression Based on Motion Compensation, Search for Motion Vectors, H.261- Intra-Frame and Inter-Frame Coding, Quantization, Encoder and Decoder, Overview of MPEG1 and MPEG2.

UNIT - V

Audio Compression Techniques: ADPCM in Speech Coding, G.726 ADPCM, Vocoders – Phase Insensitivity, Channel Vocoder, Formant Vocoder, Linear Predictive Coding, CELP, Hybrid Excitation Vocoders, MPEG Audio – MPEG Layers, MPEG Audio Strategy, MPEG Audio Compression Algorithms, MPEG-2 AAC, MPEG-4 Audio.

TEXT BOOKS:

1. Ze- Nian Li, Mark S. Drew, "Fundamentals of Multimedia", PHI, 2010.
2. Mrinal Kr. Mandal, "Multimedia Signals & Systems", Springer International Edition 1st Edition, 2009

REFERENCE BOOKS:

1. K. R. Rao, Zorans. Bojkoric, Dragorad A. Milovanovic, "Multimedia Communication Systems – Techniques, Stds & Networks", 1st Edition, 2002.
2. Ze - Nian Li, Mark S. Drew, "Fundamentals of Multimedia", Pearson Education (LPE), 1st Edition, 2009.
3. John F. Koegel Bufond, "Multimedia Systems", Pearson Education (LPE), 1st Edition, 2003.
4. Murat Tekalp, "Digital Video Processing", PHI, 1996.

5. Yaowang, Jorn Ostermann, Ya-Qin Zhang, "Video Processing and Communications", Pearson, 2002
6. Judith Jeffocate, "Print media in practice (Theory and Applications)", PHI, 1998.

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ADVANCED COMMUNICATIONS AND NETWORKS LAB

Note:

- Minimum of 10 Experiments have to be conducted
- All the Experiments may be Conducted using Network Simulation software like NS-2/ NSG-2.1/ Wire SHARK/ SDR etc.

Note: For Experiments 1 to 7 Performance may be evaluated through simulation by using the parameters Throughput, Packet Delivery Ratio, Delay etc.

1. Evaluate the performance of various LAN Topologies
2. Evaluate the performance of Drop Tail and RED queue management schemes
3. Evaluate the performance of CBQ and FQ Scheduling Mechanisms
4. Evaluate the performance of TCP and UDP Protocols
5. Evaluate the performance of TCP, New Reno and Vegas
6. Evaluate the performance of AODV, DSR and DSDV routing protocols
7. Evaluate the performance of IEEE 802.11 and IEEE 802.15.4
8. Capturing and Analysis of TCP and IP Packets
9. Simulation and Analysis of ICMP and IGMP Packets
10. Analyze the Protocols SCTP , ARP, NetBIOS, IPX VINES
11. Analysis of HTTP ,DNS and DHCP Protocols
12. Analysis of OFDM Spectrum
13. Analysis CDMA Downlink