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(58024) CELLULAR AND MOBILE COMMUNICATIONS (ELECTIVE-III)

Unit I : Introduction To Cellular Mobile Radio Systems:

Limitations of conventional mobile telephone systems, Basic Cellular Mobile System, First, second, third and fourth generation cellular wireless systems. Uniqueness of mobile radio environment-Long term fading, Factors influencing short term fading, Parameters of mobile multipath fading-Time dispersion parameters, Coherence bandwidth, Doppler spread and coherence time, Types of small scale fading.

Unit II : Fundamentals Of Cellular Radio System Design:

Concept of frequency reuse, Co-channel interference, Co-channel Interference reduction factor, Desired C/I from a normal case in a omni directional antenna system, system capacity, Trunking and grade of service. Improving coverage and capacity in cellular systems- Cell splitting, Sectoring, Microcell zone concept. www.jntuworld.com

Unit III : Co-Channel Interference :

Measurement of real time Co-Channel interference, Design of antenna system, Antenna parameters and their effects, Diversity techniques-Space diversity, Polarization diversity, Frequency diversity, Time diversity.

Unit-IV : Non-Co-Channel Interference

Adjacent channel interference, Near end far end interference, Cross talk. Effects on coverage and interference by power decrease, Antenna height decrease, Effects of cell site components, UHF TV interference.

Unit V : Cell Coverage for Signal and Traffic

Signal reflections in flat and hilly terrain, Effect of human made structures, Phase difference between direct and reflected paths, Constant standard deviation, Straight line path loss slope, General formula for mobile propagation over water and flat open area, Near and long distance propagation, Path loss from a point to point prediction model in different conditions, merits of Lee model .

Unit VI : Cell Site and Mobile Antennas

Sum and difference patterns and their synthesis, Coverage-omni directional antennas, Interference reduction- directional antennas for interference reduction, Space diversity antennas, Umbrella pattern antennas, and Minimum separation of cell site antennas, mobile antennas.

Unit-VII : Frequency Management and Channel Assignment

Numbering and grouping, Setup access and Paging channels, Channel assignments to cell sites and mobile units, Channel sharing and Borrowing, Sectorization, Overlaid cells, Non fixed channel assignment.

Unit-VIII : Handoffs and Dropped Calls

Handoff initiation, Types of handoff, Delaying handoff, Advantages of handoff, Power difference handoff, Forced handoff, Mobile assisted and soft handoff, Intersystem handoff, Introduction to dropped call rates and their evaluation. *www.jntuworld.com*

TEXT BOOKS:

1. Mobile Cellular Telecommunications – W.C.Y. Lee, Mc Graw Hill, 2nd Edn., 1989.
2. Wireless Communications - Theodore. S. Rapport, Pearson education, 2nd Edn., 2002.

REFERENCES

1. Principles of Mobile Communications – Gordon L. Stuber, Springer International, 2nd Edn., 2001.
2. Modern Wireless Communications-Simon Haykin, Michael Moher,Pearson Eduction, 2005.
3. Wireless communications theory and techniques, Asrar U. H .Sheikh, Springer, 2004.
4. Wireless Communications and Networking, Vijay Garg, Elsevier Publications, 2007.
5. Wireless Communications – Andrea Goldsmith, Cambridge University Press, 2005.

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(58025) SATELLITE COMMUNICATIONS
(ELECTIVE –III)

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Unit – I

Introduction: Origin of Satellite Communications, Historical Back-ground, Basic Concepts of Satellite Communications, Frequency allocations for Satellite Services, Applications, Future Trends of Satellite Communications.

Unit – II

Orbital Mechanics And Launchers: Orbital Mechanics, Look Angle determination, Orbital perturbations, Orbit determination, Launches and Launch vehicles, Orbital effects in communication systems performance.

Unit – III

Satellite Subsystems: Attitude and orbit control system, telemetry, tracking, Command and Monitoring, Power Systems, Communication Subsystems, Satellite antennas, Equipment reliability and Space qualification.

Unit – IV

Satellite Link Design: Basic transmission theory, system noise temperature and G/T ratio, Design of down links, Up link design, Design of satellite links for specified C/N, System design examples.

Unit – V

Multiple Access: Frequency Division Multiple Access (FDMA), Intermodulation, Calculation of C/N. Time division Multiple Access (TDMA), Frame structure, Examples. Satellite Switched TDMA Onboard processing, DAMA, Code Division Multiple access (CDMA), Spread Spectrum Transmission and Reception.

Unit – VI

Earth Station Technology: Introduction, Transmitters, Receivers, Antennas, Tracking systems, Terrestrial Interface, Primary Power test methods.

Unit – VII

Low Earth Orbit and Geo-Stationary Satellite Systems: Orbit considerations. Coverage and Frequency Consideration, Delay & Throughput

considerations, System considerations, Operational NGSO Constellation Designs.

Unit – VIII

Satellite Navigation & Global Positioning System : Radio and Satellite Navigation, GPS Position Location principles, GPS Receivers and Codes, Satellite Signal Acquisition, GPS Navigation Message, GPS Signal Levels, GPS Receiver Operation, GPS C/A code accuracy, Differential GPS.

TEXT BOOKS:

1. Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt, WSE, Wiley Publications, 2nd Edition, 2003.
2. Satellite Communications Engineering – Wilbur L. Pritchard, Robert A Nelson and Henri G.Suyderhoud, 2nd Edition, Pearson Publications, 2003. *www.jntuworld.com*

REFERENCES:

1. Satellite Communications: Design Principles – M. Richharia, BS Publications, 2nd Edition, 2003.
2. Satellite Communication - D.C Agarwal, Khanna Publications, 5th Ed.
3. Fundamentals of Satellite Communications – K.N. Raja Rao, PHI, 2004
4. Satellite Communications – Dennis Roddy, McGraw Hill, 4th Edition, 2009.

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(58026) BIO MEDICAL INSTRUMENTATION
(ELECTIVE–III)

UNIT – I:

Components of Medical Instrumentation System. Bioamplifier. Static and dynamic characteristics of medical instruments. Biosignals and characteristics. Problems encountered with measurements from human beings.

UNIT – II:

Organisation of cell. Derivation of Nernst equation for membrane Resting Potential Generation and Propagation of Action Potential, Conduction through nerve to neuromuscular junction. *www.jntuworld.com*

UNIT – III:

Bio Electrodes – Biopotential Electrodes-External electrodes, Internal Electrodes. Biochemical Electrodes.

UNIT – IV:

Mechanical function, Electrical Conduction system of the heart. Cardiac cycle. Relation between electrical and mechanical activities of the heart.

UNIT – V:

Cardiac Instrumentation: Blood pressure and Blood flow measurement. Specification of ECG machine. Einthoven triangle, Standard 12-lead configurations, Interpretation of ECG waveform with respect to electro mechanical activity of the heart.

UNIT – VI:

Therapeutic equipment.: Pacemaker, Defibrillator, Shortwave diathermy. Hemodialysis machine.

UNIT – VII:

Neuro-Muscular Instrumentation: Specification of EEG and EMG machines. Electrode placement for EEG and EMG recording. Intrepretation of EEG and EMG

UNIT – VIII:

Respiratory Instrumentation: Mechanism of respiration, Spirometry, Pnemuotachograph Ventilators.

TEXT BOOKS:

1. Biomedical Instrumentation and Measurements – by Leslie Cromwell, F.J. Weibell, E.A. Pfeiffer, PHI.
2. Medical Instrumentation, Application and Design – by John G. Webster, John Wiley. *www.jntuworld.com*

REFERENCES:

1. Principles of Applied Biomedical Instrumentation – by L.A. Geoddes and L.E. Baker, John Wiley and Sons.
2. Hand-book of Biomedical Instrumentation – by R.S. Khandpur, McGraw-Hill, 2003.
3. Biomedical Telemetry – by Mackay, Stuart R., John Wiley.

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(58016) ARTIFICIAL NEURAL NETWORKS
(ELECTIVE-III)

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UNIT I

Introduction - what is a neural network? Human Brain, Models of a Neuron, Neural networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks

UNIT II

Learning Process – Error Correction learning, Memory based learning, Hebbian learing, Competitive, Boltzmann learning, Credit Asssignment Problem, Memory, Adaption, Statistical nature of the learning process

UNIT III

Single layer perceptrons – Adaptive filtering problem, Unconstrained Organization Techniques, Linear least square filters, least mean square algorithm, learning curves, Learning rate annealing techniques, perceptron –convergence theorem, Relation between perceptron and Bayes classifier for a Gaussian Environment

UNIT IV

Multilayer Perceptron – Back propagation algorithm XOR problem, Heuristics, Output representation and decision rule, Comuter experiment, feature detection

UNIT V

Back Propagation - back propagation and differentiation, Hessian matrix, Generalization, Cross validation, Network pruning Techniques, Virtues and limitations of back propagation learning, Accelerated convergence, supervised learning.

UNIT VI

Self Organization Maps – Two basic feature mapping models, Self organization map, SOM algorithm, properties of feature map, computer simulations, learning vector quantization, Adaptive patter classification

UNIT VII

Neuro Dynamics – Dynamical systems, stability of equilibrium states, attractors, neurodynamical models, manipulation of attractors as a recurrent network paradigm

UNIT VIII

Hopfield Models – Hopfield models, computer experiment

TEXT BOOK:

1. Neural networks A comprehensive foundations, Simon Hhaykin, PHI edition.

www.jntuworld.com

REFERENCES:

1. Artifical neural networks - B.Vegnanarayana Prentice Halll of India P Ltd 2005
2. Neural networks in Computer intelligence, Li Min Fu TMH 2003
3. Neural networks James A Freeman David M S kapura pearson education 2004
4. Introduction to Artificial Neural Systems Jacek M. Zurada, JAICO Publishing House Ed. 2006.

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(58027) INTERNETWORKING
(ELECTIVE-IV)

Unit I:

Internetworking Concepts: Principles of internetworking, Connectionless Interconnection, Application level Interconnection, Network level interconnection, Interconnection through IP routers.

Network Models: Layered Tasks, The OSI Model, Layers in OSI Model, TCP/IP Protocol suite, Addressing.

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Unit II:

Connecting devices: Passive hubs, repeaters, active hubs, Bridges, Two layer Switches, Routers, Three layer switches, Gateway, Backbone Networks. IP Datagram, fragmentation, options, IPv4 Addresses-Introduction, Classful addressing, Classless Addressing, Mobile IP- Addressing, Agents, Three phases, Inefficiency in Mobile IP, IPv6 protocol-Introduction, packet format.

Unit III:

TCP: TCP Services, TCP features, segment, A TCP connection, UDP-Introduction, User datagram, UDP Services: process-to-process communication, connectionless services, flow control, error control, congestion control, encapsulation and decapsulation.

Unit IV:

TCP Flow control-opening and closing windows, shrinking windows, silly window syndrome, TCP error control-checksum, acknowledgement, retransmission, out-of-order segments, TCP Congestion control- congestion window, congestion policy.

Unit V:

Stream Control Transmission Protocol: Introduction, SCTP services: process-to-process communication, multiple streams, multi homing, full-duplex communication, connection-oriented service. SCTP features: transmission sequence number, stream identifier, packets, acknowledgement number, flow control, error control, Packet format.

Unit VI:

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

www.jntuworld.com

Unit -VII:

Domain Name System (DNS)- Name Space, Domain Name Space, Distribution of Name Space, File Transfer (FTP and TFTP)- File Transfer Protocol (FTP), TFTP, Network Management-SNMP- Concept, Management Components, World Wide Web and HTTP-Architecture, web documents, HTTP transaction, Electronic Mail- Architecture, Message transfer agent: SMTP.

Unit-VIII:

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.

TEXT BOOKS:

1. TCP/IP Protocol suite: Behrouz A. Forouzan, TMH, 4th Edition, 2010.
2. Internetworking with TCP/IP— Douglas. E.Comer, Volume I, PHI, 2000.

REFERENCES:

1. Data communication & Networking: B.A. Forouzan, TMH, 4th Edition, 2008.
2. Data and Computer Communications, William Stallings, 8th Edition, Pearson Education, 2007.

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(58028) RADAR SYSTEMS
(ELECTIVE-VI)

UNIT I
Basics of Radar : Introduction, Maximum Unambiguous Range, Simple form of Radar Equation, Radar Block Diagram and Operation, Radar Frequencies and Applications. Prediction of Range Performance, Minimum Detectable Signal, Receiver Noise, Modified Radar Range Equation, Illustrative Problems.

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UNIT II
Radar Equation : SNR, Envelope Detector – False Alarm Time and Probability, Integration of Radar Pulses, Radar Cross Section of Targets (simple targets - sphere, cone-sphere), Transmitter Power, PRF and Range Ambiguities, System Losses (qualitative treatment), Illustrative Problems.

UNIT III
CW and Frequency Modulated Radar : Doppler Effect, CW Radar – Block Diagram, Isolation between Transmitter and Receiver, Non-zero IF Receiver, Receiver Bandwidth Requirements, Applications of CW radar. Illustrative Problems

UNIT IV
FM-CW Radar, Range and Doppler Measurement, Block Diagram and Characteristics, (Approaching/ Receding Targets), FM-CW altimeter, Multiple Frequency CW Radar.

UNIT V
MTI and Pulse Doppler Radar: Introduction, Principle, MTI Radar with - Power Amplifier Transmitter and Power Oscillator Transmitter, Delay Line Cancellers – Filter Characteristics, Blind Speeds, Double Cancellation, Staggered PRFs. Range Gated Doppler Filters. MTI Radar Parameters, Limitations to MTI Performance, MTI versus Pulse Doppler Radar.

UNIT VI
Tracking Radar: Tracking with Radar, Sequential Lobing, Conical Scan,

Monopulse Tracking Radar – Amplitude Comparison Monopulse (one- and two- coordinates), Phase Comparison Monopulse, Tracking in Range, Acquisition and Scanning Patterns, Comparison of Trackers.

UNIT VII
Detection of Radar Signals in Noise : Introduction, Matched Filter Receiver – Response Characteristics and Derivation, Correlation Function and Cross-correlation Receiver, Efficiency of Non-matched Filters, Matched Filter with Non-white Noise.

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UNIT VIII
Radar Receivers – Noise Figure and Noise Temperature, Displays – types. Duplexers – Branch type and Balanced type, Circulators as Duplexers. Introduction to Phased Array Antennas – Basic Concepts, Radiation Pattern, Beam Steering and Beam Width changes, Applications, Advantages and Limitations.

TEXT BOOK:
Introduction to Radar Systems – Merrill I. Skolnik, TMH Special Indian Edition, 2nd ed., 2007.

REFERENCES:
1. Introduction to Radar Systems – Merrill I. Skolnik, 3rd ed., TMH, 2001.
2. Radar : Principles, Technology, Applications – Byron Edde, Pearson Education, 2004.
3. Radar Principles – Peebles, Jr., P.Z., Wiley, New York, 1998.

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(58029) SPREAD SPECTRUM COMMUNICATIONS
(ELECTIVE-VI)

Unit I

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Introduction to spread spectrum systems: Fundamental concepts of spread spectrum systems, Pseudo noise sequences, Direct sequence spread spectrum, Frequency hop spread spectrum, Hybrid direct sequence frequency hop spread spectrum, Code division multiple access.

Unit II

Binary shift register sequences for spread spectrum systems: Introduction, Definitions, Mathematical background and sequence generator fundamentals, Maximal length sequences, Gold codes.

Unit III

Code tracking loops: Introduction, Optimum tracking of wideband signals, Base band delay-lock tracking loop, Tau-dither non- coherent tracking loop, Double dither non-coherent tracking loop.

Unit IV

Initial synchronization of the receiver spreading code: Introduction, Problem definition and the optimum synchronizer, Serial search synchronization techniques, Synchronization using a matched filter, Synchronization by estimated the received spreading code.

Unit V

Cellular code division multiple access CDMA principles: Introduction, Wide band mobile channel, The cellular CDMA system, Single user receiver in a multi user channel, CDMA system capacity,

Unit VI

Multi-user detection in CDMA cellular radio: Optimal multi-user detection, Linear suboptimal detectors, Interference combat detection schemes, Interference cancellation techniques.

Unit VII

Performance of spread spectrum systems in jamming environments: Spread

spectrum communication system model, Performance of spread spectrum systems without coding.

Unit VIII

Performance of spread spectrum systems with forward error correction: Elementary block coding concepts, Optimum decoding rule, Calculation of error probability, Elementary convolution coding concepts, Viterbi algorithm, Decoding and bit-error rate.

TEXT BOOKS:

1. Rodger E ziemer, Roger L. Peterson and David E Borth, " Introduction to spread spectrum communication- Pearson, 1st Edition, 1995.
2. Mosa Ali Abu-Rgheff," Introduction to CDMA wireless communications." Elsevier publications, 2008.

REFERENCES: *www.jntuworld.com*

1. George R. Cooper, Clare D. Mc Gillem," Modern Communication and Spread Spectrum," McGraw Hill, 1986.
2. Andrew j. viterbi," CDMA; Principles of spread spectrum communication," Pearson Education, 1ˢᵗ Edition, 1995.
3. Kamilo Feher," Wireless Digital Communications," PHI, 2009.
4. Andrew Richardson," WCDMA Design Handbook," Cambridge University Press, 2005.
5. Steve Lee - Spread Spectrum CDMA . McGraw Hill, 2002.

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(58030) NETWORK SECURITY
(ELECTIVE-IV)

UNIT - I

Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks.

UNIT - II

Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

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UNIT - III

Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service.

UNIT - IV

Email privacy: Pretty Good Privacy (PGP) and S/MIME.

UNIT - V

IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

UNIT - VI

Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT - VII

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3. Intruders, Viruses and related threats.

UNIT - VIII

Firewall Design principles, Trusted Systems, Intrusion Detection Systems.

TEXT BOOKS :

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.
2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W.Manzuik and Ryan Permeh, wiley Dreamtech

REFERENCES : *www.jntuworld.com*

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press)
2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Cryptography and network Security, Third edition, Stallings, PHI/ Pearson
4. Principles of Information Security, Whitman, Thomson.
5. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH
6. Introduction to Cryptography, Buchmann, Springer.
7. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning.
8. Information Systems Security,Godbole,Wiley Student Edition.
9. Cryptography and network Security, B.A.Forouzan, D.Mukhopadhyay, 2nd edition,TMH.

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(58031) RF CIRCUIT DESIGN (ELECTIVE-V)

Unit-I: Introduction

Importance of RF Design-Dimensions and Units-Frequency Spectrum-RF Behaviour of Passive Components: High Frequency Resistors, High Frequency Capacitors. High Frequency Inductors.-Chip Components and circuit board considerations: Chip Resistors, Chip Capacitors, and Surface Mount Inductors.

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Unit-II:Review of Transmission Lines

Types of Transmission Lines-Equivalent Circuit representation-R, L, C, G parameters of different line configurations-Terminated Lossless Transmission lines-Special Terminations: Short Circuit, Open Circuit and Quarter Wave Transmission Lines- Sourced and Loaded transmission Lines: Power Considerations, Input Impedance Matching, Return Loss and Insertion Loss.

Unit-III:Single and Multi-Port Networks

The Smith Chart: Reflection Coefficient, Normalised Impedance-Impedance Transformation: Standing wave Ratio, Special Transformation Conditions-Admittance Transformation-Parallel and Series RL & RC Connections-Basic Definitions of Single and Multi-Port Networks-Interconnecting Networks.

Unit-IV:RF Filter Design

Scattering Parameters: Definition, Meaning, Chain Scattering Matrix, Conversion Between S- and Z-parameters, Signal Flow Chart Modeling, Generalization-Basic Resonator and Filter Configurations: Low Pass, High Pass, Band Pass and Band Stop type Filters-Filter Implementation using Unit Element and Kuroda's Identities Transformations-Coupled Filters.

Unit-V: Active RF Component Modelling

RF Diode Models: Nonlinear and Linear Models-Transistor Models: Large Signal and Small Signal BJT Models, Large Signal and Small Signal FET Models- Scattering Parameter Device Characterization.

Unit-VI: Matching and Biasing Networks

Impedance Matching Using Discrete Components: Two Component Matching Networks, Forbidden Regions, Frequency Response and Quality Factor, T and Pi Matching Networks-Amplifier Classes of Operation and Biasing Networks: Classes of Operation and Efficiency of Amplifiers, Biasing Networks for BJT, Biasing Networks for FET.

Unit-VII:RF Transistor Amplifier Design

Characteristics of Amplifiers- Amplifier Power Relations: RF Source, Transducer Power Gain, Additional Power Relations-Stability Considerations: Stability Circles, Unconditional Stability, And Stabilization Methods-Unilateral and Bilateral Design for Constant Gain- Noise Figure Circles- Constant VSWR Circles.

Unit-VIII: RF Oscillators and Mixers

Basic Oscillator Model: Negative Resistance Oscillator, Feedback Oscillator Design, Design steps, Quartz Oscillators- Fixed Frequency High Frequency Oscillator -Basic Characteristics of Mixers: Concepts, Frequency Domain Considerations, Single Ended Mixer Design, Single and Double Balanced Mixers.

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TEXT BOOKS:

1. RF Circuit Design – Theory and applications by Reinhold Ludwig, Pavel Bsetchko – Pearson Education India, 2000.
2. fRadio Frequency and Microwave communication circuits – Analysis and Design by   Devendra K.Misra – Wiley Student Edition – John Wiley & Sons, Inc.

REFERENCES:

1. Radio Frequency and Microwave Electronics – illustrated by Matthew M. Radmanesh – PEI.
2. RF Circuit Design – Christopher Bowick, Cheryl Aljuni and john Biyler, Elsevier science, 2008.
3. Secrets of RF Circuit Design by Joseph J.Carr, TMH, 2000.
4. Design of RF and Microwave Amplifiersand Oscillators, Peter L.D. Abrif, Artech House, 2000.
5. The Design of CMOS Radio Frequency Integrated circuits by Thomas H.Lee , 2/e – CambridgeUniversity Press, 2004.

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(58032) WIRELESS COMMUNICATIONS AND NETWORKS
(ELECTIVE-V)

Unit I

Introduction To Wireless Communication Systems: Evolution of mobile radio communications. Examples of wireless communication systems. Paging systems, Cordless telephone systems, Comparison of various wireless systems.

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Unit II

Modern Wireless Communication Systems: Second generation cellular networks, Third generation wireless networks, Wireless in local loop, Wireless local area networks, Blue tooth and Personal area networks.

Unit III

Cellular System Design Fundamentals: Spectrum Allocation, Basic Cellular System, Frequency reuse, Channel assignment strategies, Handoff Strategies, Interference and system capacity, Trunking and grade off service, Improving coverage and capacity, cell splitting.

Unit IV

Multiple Access Techniques For Wireless Communication: Introduction to multiple access, FDMA, TDMA, Spread spectrum multiple access, Space division multiple access, Packet radio, Capacity of a cellular systems.

Unit V

Wireless Networking: Difference between wireless and fixed telephone networks, Development of wireless networks. Fixed network transmission hierarchy, Traffic routing in wireless networks, Wireless data services, Common channel signaling.

Unit VI

Wireless WAN : Mechanism to support a mobile environment, Communication in the infrastructure, IS-95 CDMA forward channel, IS – 95 CDMA reverse channel, Packet and frame formats in IS – 95, IMT – 2000, Forward channel in W-CDMA and CDMA 2000, Reverse channels in W-

CDMA and CDMA-2000, GPRS and higher data rates, Short messaging service in GPRS mobile application protocols.

Unit VII

Wireless Lan: Historical overviews of the LAN industry, Evolution of the WLAN industry, Wireless home networking, IEEE 802.11, The PHY Layer, MAC Layer, wireless ATM, HYPER LAN, HYPER LAN – 2.

Unit VIII

Orthogonal Frequency Division Multiplexing: Basic Principles of Orthogonality, Single Versus Multi channel Systems, OFDM Block Diagram and its explanation, OFDM Signal mathematical representation.

TEXT BOOKS:

1. Theodore S. Rappaport , "Wireless Communications and Applictions," Pearson Education - 2003.
2. Upen Dalal, "Wireless Communications," Oxford University Press, 2010.
3. Kaveh Pahlavan, Prashant Krishnamoorthy, "Principles of Wireless Networks, - A united approach," Pearson Education, 2002.

REFERENCES:

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1. P.Nicopolitidis, M.S.Obaidat, G.I. papadimitria, A.S. Pomportsis, "Wireless Networks," John Wiley & Sons, 2003.
2. X.Wang and H.V.Poor, "Wireless Communication Systems," Pearson education, 2004.
3. Dr.Sunil Kumar S. Manvi, Mahabaleshwar S. Kakkasageri,"Wireless and Mobile Networks: concepts and Protocols," Wiley India, 2010.
4. Jon W. Mark and Weihua Zhqung," Wireless Communication and Networking," PHI, 2005.
5. Jochen Schiller, "Mobile Communications," Pearson Education,2nd Edition, 2003.

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(58033) DIGITAL DESIGN THROUGH VERILOG HDL (ELECTIVE-V)

Unit I

Introduction to Verilog HDL: Verilog as HDL, Levels of Design description, Concurrency, Simulation and Synthesis, Function Verification, System tasks, Programming Language interface, Module, Simulation and Synthesis tools

Unit II

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Language Constructs and Conventions: Introduction, Keywords, Identifiers, White space Characters, Comments, Numbers, Strings, Logic Values, Strengths, Data types, Scalars and vectors, parameters, operators.

Unit III

Gate Level Modeling: Introduction, AND Gate Primitive, Module structure, other gate primitives, illustrative examples, tristate gates, array of instances of primitives, Design of Flip–Flops with gate primitives, Delays, Strengths and Construction resolution, Net types, Design of basic circuit.

Unit IV

Behavioral Modeling: Introduction, Operations and assignments, functional bifurcation, 'Initial' construct, 'always' construct, Assignments with Delays, 'wait' construct, multiple always block, Designs at behavioral level, blocking and non- blocking assignments, the 'case' statement, simulation flow 'if' an 'if-else' constructs, 'assign- de-assign' construct, 'repeat' construct, for loop, ' the disable' construct, 'while loop', for ever loop, parallel blocks. ' force- release, construct, Event.

Unit V

Modeling at Dataflow Level: Introduction, Continuous assignment structure, delays and continuous assignments, assignment to vectors, operators. Switch level modeling: Basic transistor switches, CMOS switches, bi directional gates, time delays with switch primitives, instantiation with 'strengths' and ' delays', strength contention with Trireg nets.

Unit VI

System Tasks, Functions and Compiler Directives: Parameters, Path delays, module parameters, system tasks and functions, file based tasks and functions, computer directives, Hierarchical access, User defined Primitives.

Unit VI

Sequential Circuit Description: Sequential models – feedback model, capacitive model, implicit model, basic memory components, functional register, static machine coding, sequential synthesis

Unit VIII

Component Test and Verification: Test bench- combinational circuit testing, sequential circuit testing, test bench techniques, design verification, assertion verification.

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TEXT BOOKS:

1. T R. Padmanabhan, B Bala Tripura Sundari, Design through verilog HDL, Wiley, 2009.
2. Zainalabdien Navabi, Verilog Digital System Design, TMH, 2cd edition.

REFERENCES:

1. Fundamentls of Digital Logic with Veilog design by Stephen Brown, Zvonkoc Vranesic, TMH, 2nd edition, 2010
2. Digital Logic Design using Verilog , State machine & synthesis for FPGA, Sunggu Lee, Cengage Learning ,2009
3. Verilog HDL - Samir Palnitkar, 2nd Edition, Pearson Education, 2009
4. Advanced Digital Design with the Verilog HDl – Michel D. Ciletti, PHI, 2009

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(58034) PATTERN RECOGNITION
(ELECTIVE-V)

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UNIT I

PATTERN PREPROCESSING AND FEATURE SELECTION: Introduction, distance measures, clustering transformation and feature ordering, clustering in feature selection through entropy minimization, features selection through orthogonal expansion, binary feature selection.

UNIT II: PATTERN RECOGNITION OVER VIEW:

Pattern recognition, classifications description, patterns and features extraction with examples training and learning in PR systems, pattern recognition approaches

UNIT III: STATISTICAL PATTERN RECOGNITION-I:

Introduction to statistical pattern recognition, the Gaussian case and class dependence, discriminant functions, classifier performance, risk and errors

UNIT IV: STATISTICAL PATTERN RECOGNITION-II:

Bays classified decision-For Bayes classifier, Bayes classifier for normal patterns. Trainable pattern classifiers-determineistic approach perceptron approach reward-punishment concept Gradient approach,- Gradient Descent algorithms-LMSE Algorithms-Multi category classification.

UNIT V: SYNTACTIC PATTERN RECOGNITION:

Recognition with strings: String matching, Edit Distance, Computational complexity, string matching with errors, string matching with the "Don't-Care" symbol, Grammatical methods: Grammars, Types of string grammars, a grammar for pronouncing numbers, recognition using grammars, Grammatical Inference, Rule based methods: Learning rules

UNIT-VI: HIDDEN MARKOV MODELS:

First-order Markov models, first-order Hidden Markov models, hidden Markov model computation, evaluation, HMM decoding, learning.

UNIT-VII: UNSUPERVISING LEARNING AND CLUSTERING:

Clustering concepts- cluster seeking algorithms – maximum distance.

Clustering techniques to directly obtain linear classifiers. Formulation of unsupervised learning problems, clustering for unsupervised learning : LVQ, clustering strategies K-means algorithm, min-max clustering.

UNIT-VIII: SUPERVISING LEARNING:

Clustering Concepts – Cluster Seeking Algorithms, Maximum distance, clustering techniques to directly obtain linear classifiers.

TEXT BOOKS:

1. Pattern Classification - Richard duda, Hart, David strok, John Wiley, 2nd edition, 2008
2. Pattern Recognition: Statistical structure and neural approaches - sRobert Schalkoff, Wiley , 2007
3. Pattern Recognition principles -Tou.Rafael. Gonzalez, Pearson education.1978, 1st Edition.

REFERENCES: *www.jntuworld.com*

1. Pattern recognition and Image analysis - Gose Johnsonbaught. Jost PHI, 2008
2. Pattern Recognition: Concepts, Methods and Applications - J.P.Marques de Sa, Springer, 2008.
3. Pattern Recognition - Rajjan Shingal, Oxford, 2009.

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