AFFILIATED INSTITUTIONS

ANNA UNIVERSITY. CHENNAI

REGULATIONS - 2009

CURRICULUM II TO IV SEMESTERS (FULL TIME)

M.E. COMPUTER AND COMMUNICATION

SEMESTER II

SL. NO	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1	CP9221	**Optical Fiber Communication and Networking**	3	0	0	3
2	AP 9222	Computer Architecture and Parallel Processing	3	0	0	3
3	CP 9222	Wireless Networks	3	0	0	3
4	CP 9223	Internet and Java Programming	3	0	0	3
5	E2	Elective II	3	0	0	3
6	E3	Elective III	3	0	0	3
PRACTICAL						
7	CP 9227	Computer and Communication Laboratory II	0	0	4	2
		TOTAL	**18**	**0**	**4**	**20**

SEMESTER III

SL. NO	COURSE CODE	COURSE TITLE	L	T	P	C
THEORY						
1	E4	Elective IV	3	0	0	3
2	E5	Elective V	3	0	0	3
3	E6	Elective VI	3	0	0	3
PRACTICAL						
4	CP9234	Project Work (Phase I)	0	0	12	6
		TOTAL	**9**	**0**	**12**	**15**

SEMESTER IV

SL. NO	COURSE CODE	COURSE TITLE	L	T	P	C
PRACTICAL						
1	CP9241	Project Work (Phase II)	0	0	24	12
		TOTAL	**0**	**0**	**24**	**12**

TOTAL NO.OF CREDITS TO BE EARNED FOR THE AWARD OF DEGREE 21+20+15+12 =68

LIST OF ELECTIVES

M.E. COMPUTER AND COMMUNICATION

SL. NO	COURSE CODE	COURSE TITLE	L	T	P	C
1.	CU9221	Wireless Mobile Communication	3	0	0	3
2.	CP9252	Microwave Circuits	3	0	0	3
3.	AP9251	**Digital Image Processing**	**3**	**0**	**0**	**3**
4.	AP9252	Neural Networks and Its Applications	3	0	0	3
5.	VL9261	ASIC Design	3	0	0	3
6.	AP9224	Embedded Systems	3	0	0	3
7.	CP9253	High Speed Switching Architectures	3	0	0	3
8.	CP9266	Non linear Fiber Optics	3	0	0	3
9.	VL9264	Digital Speech Signal Processing	3	0	0	3
10.	CU9257	Communication Network Security	3	0	0	3
11.	NE9254	Software Engineering Methodologies	3	0	0	3
12.	CS9257	XML and Web Services	3	0	0	3
13.	CS9221	Data Base Technology	3	0	0	3
14.	CU9222	Multimedia Compression Techniques	3	0	0	3
15.	CP9259	Wireless Sensor Networks	3	0	0	3
16.	CP9260	Operating System Design	3	0	0	3
17.	CP9267	Visual Programming	3	0	0	3
18.	CS9263	Adhoc Networks	3	0	0	3
19.	CP9264	Distributed Computing	3	0	0	3
20.	CP9262	Object Oriented System Design	3	0	0	3
21.	CP9254	Soft computing				
22.		Special Elective	3	0	0	3

CP9221 OPTICAL FIBER COMMUNICATION AND NETWORKING LT P C
3 0 0 3

UNIT I FIBER OPTIC WAVE GUIDES 9

Light wave generation systems, system components, optical fibres, SI, GI, fibres, modes, Dispersion in fibres, limitations due to dispersion, Fiber loss, non linear effects. Dispersion shifted and Dispersion flattened fibres.

UNIT II OPTICAL TRANSMITTERS, RECEIVERS AND AMPLIFIERS 9

Basic concepts, LED's structure spectral distribution, semiconductor lasers, gain coefficients, modes, SLM and STM operation, Transmitter design, Receiver PIN and APD diodes design, noise sensitivity and degradation, Receiver amplifier design. Basic concepts of Semiconductor Optical amplifiers and EDFA operation.

UNIT III LIGHT WAVE SYSTEM 9

Coherent, homodyne and heterodyne keying formats, BER in synchronous – and asynchronous – receivers, Multichannel, WDM, multiple access networks, WDM components, TDM, Subcarrier and Code division multiplexing.

UNIT IV DISPERSION COMPENSATION 9

Limitations, Post- and Pre- compensation techniques, Equalizing filters, fiber based gratings, Broad band compensation, soliton communication system, fiber soliton, Soliton based communication system design, High capacity and WDM soliton system.

UNIT V PRINCIPLES OF OPTICAL NETWORKS 9

First and second generation optical networks: system network evaluation. SONET / SDH, MAN layered architecture broadcast and select networks MAC protocols, test beds, wavelength routing networks.

TOTAL : 45 PERIODS

REFERENCES

1. G.P. Agarwal, Fiber optic communication systems, 2nd Ed, John Wiley & Sons, New York, 2002.
2. G. Keiser, Optical fiber communications. 4th ed Tata McGraw-Hill, New Delhi, 2008.
3. Franz & Jain, Optical communication, Systems and components, Narosa Publications, New Delhi, 2000. .
4. Rajiv Ramaswami and Kumar Sivarajan, Optical Networks : A practical perspective", Academic press, London , 2002.
5. Harold Kolimbiris, Fiber Optic Communication, Education Asia, Delhi, ,2004

AP9222 COMPUTER ARCHITECTURE AND PARALLEL PROCESSING LT P C
3 0 0 3

UNIT I THEORY OF PARALLELISM 9

Parallel computer models - the state of computing, Multiprocessors and Multicomputers and Multivectors and SIMD computers, PRAM and VLSI models, Architectural development tracks. Program and network properties- Conditions of parallelism.

UNIT II PARTITIONING AND SCHEDULING 9

Program partitioning and scheduling, Program flow mechanisms, System interconnect architectures. Principles of scalable performance - performance matrices and measures, Parallel processing applications, speedup performance laws, scalability analysis and approaches.

UNIT III HARDWARE TECHNOLOGIES 9

Processor and memory hierarchy advanced processor technology, superscalar and vector processors, memory hierarchy technology, virtual memory technology, bus cache and shared memory - backplane bus systems, cache memory organisations, shared memory organisations, sequential and weak consistency models.

UNIT IV PIPELINING AND SUPERSCALAR TECHNOLOGIES 9

Parallel and scalable architectures, Multiprocessor and Multicomputers, Multivector and SIMD computers, Scalable, Multithreaded and data flow architectures.

UNIT V SOFTWARE AND PARALLEL PROGRAMMING 9

Parallel models, Languages and compilers, Parallel program development and environments, UNIX, MACH and OSF/1 for parallel computers.

TOTAL: 45PERIODS

REFERENCES

1. Kai Hwang, " Advanced Computer Architecture ", McGraw Hill International, 2001.
2. Dezso Sima, Terence Fountain, Peter Kacsuk, "Advanced Computer architecture – A design Space Approach" , Pearson Education , 2003.
3. John P.Shen, "Modern processor design . Fundamentals of super scalar processors", Tata McGraw Hill 2003.
4. Kai Hwang, "Scalable parallel computing", Tata McGraw Hill 1998.
5. William Stallings, " Computer Organization and Architecture", Macmillan Publishing Company, 1990.
6. M.J. Quinn, " Designing Efficient Algorithms for Parallel Computers", McGraw Hill International, 1994.
7. Barry, Wilkinson, Michael, Allen "Parallel Programming", Pearson Education Asia , 2002
8. Harry F. Jordan Gita Alaghband, " Fundamentals of parallel Processing", Pearson Education , 2003
9. Richard Y.Kain, " Advanced computer architecture –A systems Design Approach", PHI, 2003.

CP9222 **WIRELESS NETWORKS** **LT P C**
3 0 0 3

UNIT I WIRELESS LOCAL AREA NETWORKS 9

Introduction to wireless LANs - IEEE 802.11 WLANs - Physical Layer- MAC sublayer- MAC Management Sublayer- Wireless ATM - HIPERLAN- HIPERLAN-2, WiMax

UNIT II 3G OVERVIEW & 2.5G EVOLUTION 9

Migration path to UMTS, UMTS Basics, Air Interface, 3GPP Network Architecture, CDMA2000 overview- Radio and Network components, Network structure, Radio network, TD-CDMA, TD-SCDMA.

UNIT III ADHOC & SENSOR NETWORKS 9

Characteristics of MANETs, Table-driven and Source-initiated On Demand routing protocols, Hybrid protocols, Wireless Sensor networks- Classification, MAC and Routing protocols.

UNIT IV INTERWORKING BETWEEN WLANS AND 3G WWANS 9

Interworking objectives and requirements, Schemes to connect WLANs and 3G Networks, Session Mobility, Interworking Architectures for WLAN and GPRS, System Descripltion, Local Multipoint Distribution Service, Multichannel Multipoint Distribution system.

UNIT V 4G & BEYOND 9

4G features and challenges, Technology path, IMS Architecture, Convergent Devices, 4G technologies, Advanced Broadband Wireless Access and Services, Multimedia, MVNO.

TOTAL: 45 PERIODS

REFERENCES

1. Clint Smith. P.E., and Daniel Collins, “3G Wireless Networks”, 2nd Edition, Tata McGraw Hill, 2007.
2. Vijay. K. Garg, “Wireless Communication and Networking”, Morgan Kaufmann Publishers, http://books.elsevier.com/9780123735805:, 2007.
3. Kaveth Pahlavan,. K. Prashanth Krishnamuorthy, "Principles of Wireless Networks", Prentice Hall of India, 2006.
4. William Stallings, "Wireless Communications and networks" Pearson / Prentice Hall of India, 2nd Ed., 2007.
5. Dharma Prakash Agrawal & Qing-An Zeng, “Introduction to Wireless and Mobile Systems”, Thomson India Edition, 2nd Ed., 2007.
6. Gary. S. Rogers & John Edwards, “An Introduction to Wireless Technology”, Pearson Education, 2007.
7. Sumit Kasera and Nishit Narang, “ 3G Networks – Architecture, Protocols and Procedures”, Tata McGraw Hill, 2007.

CP9223 INTERNET AND JAVA PROGRAMMING L T P C
3 0 0 3

UNIT I INTRODUCTION 9

Introduction to the Internet and World Wide Web - World Wide Web Consortium (W3C) - History of the Internet History of the World Wide Web - History of SGML -*XML* Introduction to HyperText Markup Language - Editing HTML - Common Elements – Headers - Linking - Images - Unordered Lists - Nested and Ordered Lists - HTML Tables-Basic HTML Forms

UNIT II DYNAMIC HTML 9

Dynamic HTML Object Model and Collections, Event Model, Filters and Transitions, Data Binding with Tabular Data Control, Dynamic HTML-Structured Graphics ActiveX Controls, Dynamic HTML-Path, Sequencer and Sprite ActiveX Controls.

UNIT III JAVASCRIPT 9

JavaScript, Introduction to Scripting, Control Statements, Functions, Arrays, Objects.

UNIT IV XML 9

Creating Markup with XML-Parsers and Well-formed XML Documents -Parsing an XML Document with msxml - Document Type Definition (DTD) - Document Type Declaration - Element Type Declarations - Attribute Declarations - Document Object Model - DOM Implementations - – DOM Components - path - XSL: Extensible Stylesheet Language Transformations (XSLT)

UNIT V PERL, CGI AND PHP 9

Perl - String Processing and Regular Expressions - Form Processing and Business Logic - Server-Side Includes - Verifying a Username and Password - Using DBI to Connect to a Database -PHP - Form Processing and Business Logic --Connecting to a Database - Dynamic Content in PHP.

TOTAL : 45 PERIODS

REFERENCES

1. Deitel & Deitel Internet & World Wide Web How to Program, Pearson Education India **-**Third Edition -2004
2. Deitel & Deitel XML How to Program, Pearson Education,2001
3. Robert W.Sebesta , " Programming withWorld Wide Web",Pearson Education ,2009
4. Negrino and Smith Javascript for the World Wide Web, 5th Edition, Peachpit Press 2003.
5. Deitel & Deitel Perl How to Program, Pearson Education, 2001
6. Benoit Marchal, XML by Example, 2nd Edition, Que/Sams 2002.

CP9227 COMPUTER AND COMMUNICATION LABORATORY II L T P C
0 0 4 2

1. DC characteristics of PIN PD and APD.
2. P-I characteristics of LED and LASER.
3. Optical link simulation using simulator packages.
4. Web design with HTML.
5. Web design with JAVA.
6. Simulation of ATM switches.
7. Simulation and Implementation of ATM congestion control algorithm. (using free ATM network simulator software)

TOTAL : 60 PERIODS

CU9221 WIRELESS MOBILE COMMUNICATION L T P C
3 0 0 3

UNIT I THE WIRELESS CHANNEL 9

Overview of wireless systems – Physical modeling for wireless channels – Time and Frequency coherence – Statistical channel models – Capacity of wireless Channel- Capacity of Flat Fading Channel –– Channel Distribution Information known – Channel Side Information at Receiver – Channel Side Information at Transmitter and Receiver – Capacity with Receiver diversity – Capacity comparisons – Capacity of Frequency Selective Fading channels

UNIT II PERFORMANCE OF DIGITAL MODULATION OVER WIRELESS CHANNELS 8

Fading– Outage Probability– Average Probability of Error –– Combined Outage and Average Error Probability – Doppler Spread – Intersymbol Interference.

UNIT III DIVERSITY 9

Realization of Independent Fading Paths – Receiver Diversity – Selection Combining – Threshold Combining – Maximal-Ratio Combining – Equal - Gain Combining – Transmitter Diversity – Channel known at Transmitter – Channel unknown at Transmitter – The Alamouti Scheme.

UNIT IV MULTICARRIER MODULATION 10

Data Transmission using Multiple Carriers – Multicarrier Modulation with Overlapping Subchannels – Mitigation of Subcarrier Fading – Discrete Implementation of Multicarrier Modulation – Peak to average Power Ratio- Frequency and Timing offset – Case study IEEE 802.11a.

UNIT V SPREAD SPECTRUM 9

Spread Spectrum Principles – Direct Sequence Spread Spectrum – Spreading Codes- Synchronization- RAKE receivers- Frequency Hopping Spread Spectrum – Multiuser DSSS Systems – Multiuser FHSS Systems.

TOTAL : 45 PERIODS

REFERENCES

1. Andrea Goldsmith, Wireless Communications, Cambridge University Press, 2005
2. David Tse and Pramod Viswanath, Fundamentals of Wireless Communication, Cambridge University Press, 2005.
3. W.C.Y.Lee, Mobile Communication Engineering, Mc Graw Hill, 2000
4. A.Paulraj, R.Nabar, D.Gore, Introduction to Space-Time Wireless Communication, Cambridge University Press, 2003.
5. T.S. Rappaport, Wireless Communications, Pearson Education, 2003

CP9252 MICROWAVE CIRCUITS LT P C
3 0 0 3

UNIT I CIRCUIT REPRESENTATION AND IMPEDANCE MATCHING 9

Low Frequency Parameters- Impedance matrix, Admittance matrix, ABCD matrix. High Frequency Parameters-S MATRIX, Formulation, Signal Flow Graphs. Smith Chart (ZY), Selection of Matching, Networks, Design of Matching Networks using lumped and distributed elements, using Smith Chart, FOSTERS REACTANCE Theorem.

UNIT II NOISE AND DISTORTION IN MICROWAVE CIRCUITS 9

Review of Random Process - Thermal noise – available noise power and noise voltage – Auto correlation and Power spectral density in linear systems – Gaussian white noise – Mixing of noise – Narrow band representation of noise – probability of error for threshold detection – Noise Temperature, Noise factor and Noise figure, Equivalent noise temperature of non thermal sources. Noise temperature of cascaded networks. Noise figure of passive two port networks. Dynamic range and intermodulation distortion – Gain compression – third order intercept point. Intercept point of cascaded network.

UNIT III FILTERS 9

Filter design by Insertion loss method, Butterworth and Tchebycheff Low pass filters. Impedance and frequency scaling for low pass filters – Band pass and band stop transformation – Design examples – Filters using transmission line stubs – stepped impedance low pass filters – Band pass filters using transmission line resonators – capacitively coupled quarter wave resonators-Micro strip filters-Coupled resonator band pass filters

UNIT IV AMPLIFIERS 9

FET and Bipolar Transistor models, two port power gain. Derivation of stability circles and stability criteria – unconditionally stable configuration and simultaneous conjugate matching – Amplifier design using S parameters – constant Noise figure circles – Design for maximum gain power amplifiers,LNA Design.

UNIT V **OSCILLATORS AND MIXERS 9**

Oscillator using common emitter BJT and common Gate FET – Practical consideration – Voltage Controlled Oscillators , Negative Resistance Oscillators – Dielectric resonator Oscillators – Frequency synthesis methods – PLL Analysis, Oscillator Phase Noise.
Mixer characteristics – Image Frequency - Conversion Loss – Noise figure –Intermediate Distortion – Single ended Diode Mixer – Balanced Mixer – Small signal Analysis – Image Reject Mixer.

TOTAL : 45 PERIODS

REFERENCES:

1. Collins, R.E, “Foundations for Microwave Engineering”, II edition, The IEEE Press Series on Electromagnetic wave theory, 2002.
2. Mathew M.Radmanesh,”Radio Frequency and Micro wave Electronics”, Pearson Education, 2002
3. David M. Pozar, “Microwave and RF Design of Wireless systems” , John Wiley & sons, 2001.
4. Thomas H.Lee”Planat Microwave Engineering” Cambridge University press, 2004.

AP9251 DIGITAL IMAGE PROCESSING LT P C
3 0 0 3

UNIT I DIGITAL IMAGE FUNDAMENTALS 9

Elements of digital image processing systems, Vidicon and Digital Camera working principles, Elements of visual perception, brightness, contrast, hue, saturation, Mach Band effect, Image sampling, Quantization, Dither, Two dimensional mathematical preliminaries.

UNIT II IMAGE TRANSFORMS 9

1D DFT, 2D transforms - DFT, DCT, Discrete Sine, Walsh, Hadamard, Slant, Haar, KLT, SVD, Wavelet transform.

UNIT III IMAGE ENHANCEMENT AND RESTORATION 9

Histogram modification, Noise distributions, Spatial averaging, Directional Smoothing, Median, Geometric mean, Harmonic mean, Contraharmonic and Yp mean filters . Design of 2D FIR filters.

Image restoration - degradation model, Unconstrained and Constrained restoration, Inverse filtering-removal of blur caused by uniform linear motion, Wiener filtering, Geometric transformations-spatial transformations, Gray Level interpolation. .

UNIT IV IMAGE SEGMENTATION AND RECOGNITION 9

Image segmentation - Edge detection, Edge linking and boundary detection, Region growing, Region splitting and Merging, Image Recognition - Patterns and pattern classes, Matching by minimum distance classifier, Matching by correlation., Neural networks-Back propagation network and training, Neural network to recognize shapes.

UNIT V IMAGE COMPRESSION 9

Need for data compression, Huffman, Run Length Encoding, Shift codes, Arithmetic coding, Vector Quantization, Block Truncation Coding, Transform coding, JPEG standard, JPEG 2000, EZW, SPIHT, MPEG.

TOTAL : 45 PERIODS

REFERENCES

1. Rafael C. Gonzalez, Richard E. Woods, “ Digital Image Processing”, Pearson Education, Inc., Second Edition, 2004
2. Anil K. Jain, “Fundamentals of Digital Image Processing”, Prentice Hall of India, 2002.
3. Rafael C. Gonzalez, Richard E. Woods, Steven Eddins,” Digital Image Processing

using MATLAB", Pearson Education, Inc., 2004.
4. D.E. Dudgeon and R.M. Mersereau, "Multidimensional Digital Signal Processing", Prentice Hall Professional Technical Reference, 1990.
5. William K. Pratt, " Digital Image Processing", John Wiley, New York, 2002.
6. Milan Sonka et al, "Image Processing, Analysis and Machine Vision", Brookes/Cole, Vikas Publishing House, 2nd edition, 1999;
7. Sid Ahmed, M.A., " Image Processing Theory, Algorithms and Architectures", McGrawHill, 1995.

AP9252 NEURAL NETWORKS AND ITS APPLICATIONS LT P C
3 0 0 3

UNIT I BASIC LEARNING ALGORITHMS 9

Biological Neuron – Artificial Neural Model - Types of activation functions – Architecture: Feed forward and Feedback – Learning Process: Error Correction Learning –Memory Based Learning – Hebbian Learning – Competitive Learning - Boltzman Learning – Supervised and Unsupervised Learning – Learning Tasks: Pattern Space – Weight Space – Pattern Association – Pattern Recognition – Function Approximation – Control – Filtering - Beam forming – Memory – Adaptation - Statistical Learning Theory – Single Layer Perceptron – Perceptron Learning Algorithm – Perceptron Convergence Theorem – Least Mean Square Learning Algorithm – Multilayer Perceptron – Back Propagation Algorithm – XOR problem – Limitations of Back Propagation Algorithm.

UNIT II RADIAL-BASIS FUNCTION NETWORKS AND SUPPORT VECTOR MACHINES :RADIAL BASIS FUNCTION NETWORKS 9

Cover's Theorem on the Separability of Patterns - Exact Interpolator – Regularization Theory – Generalized Radial Basis Function Networks - Learning in Radial Basis Function Networks - Applications: XOR Problem – Image Classification.

Support Vector Machines:

Optimal Hyperplane for Linearly Separable Patterns and Nonseparable Patterns – Support Vector Machine for Pattern Recognition – XOR Problem - $\in$-insensitive Loss Function – Support Vector Machines for Nonlinear Regression

UNIT III COMMITTEE MACHINES 9

Ensemble Averaging - Boosting – Associative Gaussian Mixture Model – Hierarchical Mixture of Experts Model(HME) – Model Selection using a Standard Decision Tree – A Priori and Postpriori Probabilities – Maximum Likelihood Estimation – Learning Strategies for the HME Model - EM Algorithm – Applications of EM Algorithm to HME Model

NEURODYNAMICS SYSTEMS

Dynamical Systems – Attractors and Stability – Non-linear Dynamical Systems- Lyapunov Stability – Neurodynamical Systems – The Cohen-Grossberg Theorem.

UNIT IV ATTRACTOR NEURAL NETWORKS 9

Associative Learning – Attractor Neural Network Associative Memory – Linear Associative Memory – Hopfield Network – Content Addressable Memory – Strange Attractors and Chaos - Error Performance of Hopfield Networks - Applications of Hopfield Networks – Simulated Annealing – Boltzmann Machine – Bidirectional Associative Memory – BAM Stability Analysis – Error Correction in BAMs - Memory Annihilation of Structured Maps in BAMS – Continuous BAMs – Adaptive BAMs – Applications

ADAPTIVE RESONANCE THEORY

Noise-Saturation Dilemma - Solving Noise-Saturation Dilemma – Recurrent On-center – Off-surround Networks – Building Blocks of Adaptive Resonance – Substrate of Resonance Structural Details of Resonance Model – Adaptive Resonance Theory – Applications

UNIT V SELF ORGANISING MAPS 9

Self-organizing Map – Maximal Eigenvector Filtering – Sanger's Rule – Generalized Learning Law – Competitive Learning - Vector Quantization – Mexican Hat Networks - Self-organizing Feature Maps – Applications

PULSED NEURON MODELS:

Spiking Neuron Model – Integrate-and-Fire Neurons – Conductance Based Models – Computing with Spiking Neurons.

TOTAL: 45 PERIODS

REFERENCES

1. Satish Kumar, "Neural Networks: A Classroom Approach", Tata McGraw-Hill Publishing Company Limited, New Delhi, 2004.
2. Simon Haykin, "Neural Networks: A Comprehensive Foundation", 2ed., Addison Wesley Longman (Singapore) Private Limited, Delhi, 2001.
3. Martin T.Hagan, Howard B. Demuth, and Mark Beale, "Neural Network Design", Thomson Learning, New Delhi, 2003.
4. James A. Freeman and David M. Skapura, "Neural Networks Algorithms, Applications, and Programming Techniques, Pearson Education (Singapore) Private Limited, Delhi, 2003.

VL9261 ASIC DESIGN LT P C
3 0 0 3

UNIT I INTRODUCTION TO ASICS, CMOS LOGIC AND ASIC LIBRARY DESIGN 9

Types of ASICs - Design flow - CMOS transistors CMOS Design rules - Combinational Logic Cell – Sequential logic cell - Data path logic cell - Transistors as Resistors - Transistor Parasitic Capacitance- Logical effort –Library cell design - Library architecture

UNIT II PROGRAMMABLE ASICS, PROGRAMMABLE ASIC LOGIC CELLS

AND PROGRAMMABLE ASIC I/O CELLS **9**

Anti fuse - static RAM - EPROM and EEPROM technology - PREP benchmarks - Actel - Xilinx LCA –Altera FLEX - Altera MAX DC & AC inputs and outputs - Clock & Power inputs - Xilinx I/O blocks.

UNIT III PROGRAMMABLE ASIC INTERCONNECT, PROGRAMMABLE ASIC DESIGN SOFTWARE AND LOW LEVEL DESIGN ENTRY **9**

Actel ACT -Xilinx LCA - Xilinx EPLD - Altera MAX 5000 and 7000 - Altera MAX 9000 - Altera FLEX –Design systems - Logic Synthesis - Half gate ASIC -Schematic entry - Low level design language - PLA tools -EDIF- CFI design representation.

UNIT IV LOGIC SYNTHESIS, SIMULATION AND TESTING **9**

Verilog and logic synthesis -VHDL and logic synthesis - types of simulation -boundary scan test - fault simulation - automatic test pattern generation.

UNIT V ASIC CONSTRUCTION, FLOOR PLANNING, PLACEMENT AND ROUTING **9**

System partition - FPGA partitioning - partitioning methods - floor planning - placement - physical design flow –global routing - detailed routing - special routing - circuit extraction - DRC.

TOTAL : 45 PERIODS

REFERENCES

1. M.J.S .Smith, "Application Specific Integrated Circuits, Addison -Wesley Longman Inc., 1997.
2. Farzad Nekoogar and Faranak Nekoogar, From ASICs to SOCs: A Practical Approach, Prentice Hall PTR, 2003.
3. Wayne Wolf, FPGA-Based System Design, Prentice Hall PTR, 2004.
4. R. Rajsuman, System-on-a-Chip Design and Test. Santa Clara, CA: Artech House Publishers, 2000.
5. F. Nekoogar. Timing Verification of Application-Specific Integrated Circuits (ASICs). Prentice Hall PTR, 1999.

AP9224 EMBEDDED SYSTEMS **L T P C**
3 0 0 3

UNIT I EMBEDDED PROCESSORS **9**

Embedded Computers, Characteristics of Embedded Computing Applications, Challenges in Embedded Computing system design, Embedded system design process- Requirements, Specification, Architectural Design, Designing Hardware and Software Components, System Integration, Formalism for System Design- Structural Description, Behavioural Description, Design Example: Model Train Controller, ARM processor- processor and memory organization.

UNIT II EMBEDDED PROCESSOR AND COMPUTING PLATFORM **9**

Data operations, Flow of Control, SHARC processor- Memory organization, Data operations, Flow of Control, parallelism with instructions, CPU Bus configuration, ARM Bus, SHARC Bus, Memory devices, Input/output devices, Component interfacing, designing with microprocessor development and debugging, Design Example : Alarm Clock. Hybrid Architecture

UNIT III NETWORKS 9

Distributed Embedded Architecture- Hardware and Software Architectures, Networks for embedded systems- I2C, CAN Bus, SHARC link supports, Ethernet, Myrinet, Internet, Network-Based design- Communication Analysis, system performance Analysis, Hardware platform design, Allocation and scheduling, Design Example: Elevator Controller.

UNIT IV REAL-TIME CHARACTERISTICS 9

Clock driven Approach, weighted round robin Approach, Priority driven Approach, Dynamic Versus Static systems, effective release times and deadlines, Optimality of the Earliest deadline first (EDF) algorithm, challenges in validating timing constraints in priority driven systems, Off-line Versus On-line scheduling.

UNIT V SYSTEM DESIGN TECHNIQUES 9

Design Methodologies, Requirement Analysis, Specification, System Analysis and Architecture Design, Quality Assurance, Design Example: Telephone PBX- System Architecture, Ink jet printer- Hardware Design and Software Design, Personal Digital Assistants, Set-top Boxes.

TOTAL : 45 PERIODS

REFERENCES:

1. Wayne Wolf, “Computers as Components: Principles of Embedded Computing System Design”, Morgan Kaufman Publishers.
2. Jane.W.S. Liu, “Real-Time systems”, Pearson Education Asia.
3. C. M. Krishna and K. G. Shin, “Real-Time Systems” , McGraw-Hill, 1997
4. Frank Vahid and Tony Givargis, “Embedded System Design: A Unified Hardware/Software Introduction” , John Wiley & Sons.

CP9253 HIGH SPEED SWITCHING ARCHITECTURES LT P C
3 0 0 3

UNIT I LAN SWITCHING TECHNOLOGY 9

Switching Concepts, switch forwarding techniques, switch path control, LAN Switching, cut through forwarding, store and forward, virtual LANs.

UNIT II ATM SWITCHING ARCHITECTURE 9

Blocking networks - basic - and- enhanced banyan networks, sorting networks - merge sorting, re-arrangable networks - full-and- partial connection networks, non blocking networks - Recursive network construction, comparison of non-blocking network, Switching with deflection routing - shuffle switch, tandem banyan switch.

UNIT III QUEUES IN ATM SWITCHES 9

Internal Queueing -Input, output and shared queueing, multiple queueing networks – combined Input, output and shared queueing - performance analysis of Queued switches.

UNIT IV PACKET SWITCHING ARCHITECTURES 9

Architectures of Internet Switches and Routers- Bufferless and buffered Crossbar switches,Multi-stage switching, Optical Packet switching; Switching fabric on a chip; Internally buffered Crossbars.

UNIT V IP SWITCHING 9

Addressing model, IP Switching types - flow driven and topology driven solutions, IP Over ATM address and next hop resolution, multicasting, Ipv6 over ATM.

TOTAL : 45 PERIODS

REFERENCES

1. Achille Pattavina, “Switching Theory: Architectures and performance in Broadband ATM networks ",John Wiley & Sons Ltd, New York. 1998
2. Elhanany M. Hamdi, “High Performance Packet Switching architectures”, Springer Publications, 2007.
3. Christopher Y Metz, “Switching protocols & Architectures”, McGraw - Hill Professional Publishing, NewYork.1998.
4. Rainer Handel, Manfred N Huber, Stefan Schroder, “ATM Networks - Concepts Protocols, Applications”, 3rd Edition, Addison Wesley, New York. 1999.

CP9266 NONLINEAR FIBER OPTICS LT P C
3 0 0 3

UNIT I FIBER NONLINEARITIES 9

Introduction - Nonlinear Refraction - Maxwell's Equations - Fiber Modes - Eigen value Equations - Single Mode Condition - Nonlinear pulse Propagation - Higher Order Nonlinear Effects.

UNIT II GROUP VELOCITY DISPERSION AND PHASE MODULATION 10

Gaussian Pulse - Chirped Gaussian Pulse - Higher Order Dispersions - Changes in Pulse Shape – Self Phase Modulation (SPM) induced Spectral Broadening - Non-linear Phase Shift - Effect of Group Velocity Dispersion - Self Steepening - Application of SPM-Cross Phase Modulation (XPM) - Coupling between Waves of Different Frequencies - Non-linear Birefringence - Optical Kerr Effect - Pulse Shaping.

UNIT III OPTICAL SOLITONS AND DISPERSION MANAGEMENT 9

Soliton Characteristics - Soliton Stability - Dark Solitons – Other kinds of Solitons - Effect of Birefringence in Solitons - Solitons based Fiber Optic Communication System (Qualitative treatment) – Demerits - Dispersion Managed Solitons (DMS).

UNIT IV SOLITON LASERS 8

Non-linear Fiber Loop Mirrors - Soliton Lasers - Fiber Raman Lasers - Fiber Raman Amplifiers - Fiber Raman Solitons - Erbium doped fiber amplifiers.

UNIT V APPLICATIONS OF SOLITONS 9

DMS for single channel transmission – WDM transmission - Fiber Gratings- Fiber Couplers – Fiber Interferometers – Pulse Compression – Soliton Switching – Soliton light wave systems.

TOTAL : 45 PERIODS

REFERENCES

1. Govind P. Agrawal, 'Nonlinear Fiber Optics', Academic Press, New York (1995).
2. A. Hasegawa and M. Matsumoto, ' Optical Solitons in Fibers', Springer, Berlin (2003).
3. Govind P. Agrawal, 'Applications of Nonlinear Fiber Optics', Academic Press, New York (2001).
4. M. Lakshmanan and S. Rajasekar, 'Nonlinear Dynamics: Integrability, Chaos and Patterns', Springer, Berlin (2003).
5. Y. S. Kivshar and Given Agrawal, 'Optical Solitons : From Fibers to Photonic Crystals', Academic Press, New York (2003).

VL9264 DIGITAL SPEECH SIGNAL PROCESSING LT P C
3 0 0 3

UNIT I MECHANICS OF SPEECH 8

Speech production mechanism – Nature of Speech signal – Discrete time Modelling of Speech production – Representation of Speech signals – Classification of Speech sounds – Phones – Phonemes – Phonetic and Phonemic alphabets – Articulatory features. Music production – Auditory perception – Anatomical pathways from the ear to the perception of sound – Peripheral auditory system – Psycho acoustics

UNIT II TIME DOMAIN METHODS FOR SPEECH PROCESSING 8

Time domain parameters of Speech signal – Methods for extracting the parameters Energy, Average Magnitude – Zero crossing Rate – Silence Discrimination using ZCR and energy – Short Time Auto Correlation Function – Pitch period estimation using Auto Correlation Function

UNIT III FREQUENCY DOMAIN METHOD FOR SPEECH PROCESSING 9

Short Time Fourier analysis – Filter bank analysis – Formant extraction – Pitch Extraction – Analysis by Synthesis- Analysis synthesis systems- Phase vocoder— Channel Vocoder.

HOMOMORPHIC SPEECH ANALYSIS:

Cepstral analysis of Speech – Formant and Pitch Estimation – Homomorphic Vocoders.

UNIT IV LINEAR PREDICTIVE ANALYSIS OF SPEECH 10

Formulation of Linear Prediction problem in Time Domain – Basic Principle – Auto correlation method – Covariance method – Solution of LPC equations – Cholesky method – Durbin's Recursive algorithm – lattice formation and solutions – Comparison of different methods – Application of LPC parameters – Pitch detection using LPC parameters – Formant analysis – VELP – CELP.

UNIT V APPLICATION OF SPEECH SIGNAL PROCESSING 10

Algorithms: Spectral Estimation, dynamic time warping, hidden Markov model – Music analysis – Pitch Detection – Feature analysis for recognition –Automatic Speech Recognition – Feature Extraction for ASR – Deterministic sequence recognition – Statistical Sequence recognition – ASR systems – Speaker identification and verification – Voice response system – Speech Synthesis: Text to speech, voice over IP.

TOTAL : 45 PERIODS

REFERENCES

1. Ben Gold and Nelson Morgan, Speech and Audio Signal Processing, John Wiley and Sons Inc. , Singapore, 2004
2. L.R.Rabiner and R.W.Schaffer – Digital Processing of Speech signals – Prentice Hall 1978
3. Quatieri – Discrete-time Speech Signal Processing – Prentice Hall – 2001.
4. J.L.Flanagan – Speech analysis: Synthesis and Perception – 2nd edition – Berlin – 1972
5. I.H.Witten – – Principles of Computer Speech – Academic Press – 1982.

CU9257 COMMUNICATION NETWORK SECURITY LT P C

3 0 0 3

UNIT I INTRODUCTION ON SECURITY 9

Security Goals, Types of Attacks: Passive attack, active attack, attacks on confidentiality, attacks on Integrity and availability. Security services and mechanisms, Techniques : Cryptography, Steganography , Revision on Mathematics for Cryptography.

UNIT II SYMMETRIC & ASYMMETRIC KEY ALGORITHMS 9

Substitution Ciphers, Transposition Ciphers, Stream and Block Ciphers, Data Encryption Standards (DES), Advanced Encryption Standard (AES), RC4,principle of asymmetric key algorithms, RSA Cryptosystem

UNIT III INTEGRITY, AUTHENTICATION AND KEY MANAGEMENT 9

Message Integrity, Hash functions : SHA, Digital signatures : Digital signature standards. Authentication Entity Authentication: Biometrics, Key management Techniques.

UNIT IV NETWORK SECURITY, FIREWALLS AND WEB SECURITY 9

Introduction on Firewalls, Types of Firewalls, Firewall Configuration and Limitation of Firewall. IP Security Overview, IP security Architecture, authentication Header, Security payload, security associations, Key Management. Web security requirement, secure sockets layer, transport layer security, secure electronic transaction, dual signature

UNIT V WIRELESS NETWORK SECURITY 9

Security Attack issues specific to Wireless systems: Worm hole, Tunneling, DoS.WEP for Wi-Fi network, Security for 4G networks: Secure Ad hoc Network, Secure Sensor Network

TOTAL: 45 PERIODS

REFERENCES

1. Behrouz A. Fourcuzan ," Cryptography and Network security" Tata McGraw- Hill, 2008
2. William Stallings,"Cryptography and Network security: principles and practice",2nd Edition,Prentice Hall of India,New Delhi,2002
3. Atul Kahate ," Cryptography and Network security", 2nd Edition, Tata McGraw- Hill, 2008
4. R.K.Nichols and P.C. Lekkas ," Wireless Security"
5. H. Yang et al., Security in Mobile Ad Hoc Networks: Challenges and Solution, IEEE Wireless Communications, Feb. 2004.
6. Securing Ad Hoc Networks," IEEE Network Magazine, vol. 13, no. 6, pp. 24-30, December 1999.
7. "Security of Wireless Ad Hoc Networks," http://www.cs.umd.edu/~aram/wireless/survey.pdf.
8. David Boel et.al (Jan 2008) "Securing Wireless Sensor Networks – Security Architecture " Journal of networks , Vol.3. No. 1. pp. 65 -76.
9. Perrig, A., Stankovic, J., Wagner, D. (2004), "Security in Wireless Sensor Networks", *Communications of the ACM*, 47(6), 53-57.

NE9254 SOFTWARE ENGINEERING METHODOLOGIES LT P C
3 0 0 3

UNIT I 9

Definition – systems approach – modeling the process and lifecycle – meaning of process – software process models – tools and techniques – practical process modeling – information systems – planning and managing the project – tracking project – project personnel – effort estimation – risk management – project plan – process models and project management

UNIT II 9

Capturing the requirements – requirements process – requirements elicitation – types – characteristics – modeling notations – specification languages – prototyping – documentation – validation and verification – measures – specification techniques – designing the system – decomposition and modularity – architectural styles and strategies – issues – characteristics – improvement techniques – design evaluation, validation – documentation

UNIT III 8

Considering objects – object orientation – OO development – use cases – representing OO – OO system design – program design – OO measurement – writing programs – standards – procedures – guidelines – documentation – programming process

UNIT IV **9**

Testing the program – faults – failures – issues – unit testing – Integration testing – testing OO systems – test planning – automated testing tools - testing the system – principles – function testing – performance testing – reliability, availability and maintainability – acceptance testing – installation testing – automated system testing – test documentation – testing safety critical systems – delivering the system – training – documentation

UNIT V **10**

System maintenance – the changing system – nature of maintenance – problems – measuring maintenance characteristics – techniques and tools – software rejuvenation – evaluation approaches – selection – assessment vs. prediction - evaluating products, processes and resources – improving predictions, products, processes and resources – guidelines – decision making in software engineering – licensing – certification and ethics

TOTAL: 45 PERIODS

REFERENCES

1. Shari Lawrence Pfleeger, Joanne M. Atlee, Software Engineering: Theory and Practice, Prentice Hall, 2006
2. Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli, Fundamentals of Software Engineering, Prentice Hall, 2002

CS 9257 XML AND WEB SERVICES L T P C
3 0 0 3

UNIT I XML TECHNOLOGY FAMILY **9**

XML – benefits – Advantages of XML over HTML – EDL –Databases – XML based standards – DTD –XML Schemas – X- Files – XML processing – DOM –SAX-presentation technologies – XSL – XFORMS – XHTML – voice XML – Transformation – XSLT – XLINK – XPATH –XQ

UNIT II ARCHITECTING WEB SERVICES **9**

Business motivations for web services – B2B – B2C- Technical motivations – limitations of CORBA and DCOM – Service – oriented Architecture (SOA) – Architecting web services – Implementation view – web services technology stack – logical view – composition of web services – deployment view – from application server to peer to peer – process view – life in the runtime

UNIT III WEB SERVICES BUILDING BLOCK **9**

Transport protocols for web services – messaging with web services – protocols – SOAP – describing web services – WSDL – Anatomy of WSDL – manipulating WSDL – web service policy – Discovering web services – UDDI – Anatomy of UDDI- Web service inspection – Ad-Hoc Discovery – Securing web services.

UNIT IV IMPLEMENTING XML IN E-BUSINESS **9**

B2B - B2C Applications – Different types of B2B interaction – Components of e-business XML systems – ebXML – Rosetta Net Applied XML in vertical industry – Web services for mobile devices.

UNIT V XML AND CONTENT MANAGEMENT 9

Semantic Web – Role of Meta data in web content – Resource Description Framework – RDF schema – Architecture of semantic web – content management workflow – XLANG –WSFL.

TOTAL: 45 PERIODS

TEXT BOOKS

1. Ron schmelzer et al, "XML and Web Services", Pearson Education, 2002.
2. Sandeep Chatterjee and James Webber, "Developing Enterprise Web Services: An Architect's Guide", Prentice Hall, 2004.

REFERENCES

1. Frank P. Coyle, "XML, Web Services and the Data Revolution", Pearson Education, 2002.
2. Keith Ballinger, ".NET Web Services Architecture and Implementation", Pearson Education, 2003.
3. Henry Bequet and Meeraj Kunnumpurath, "Beginning Java Web Services", Apress, 2004.
4. Russ Basiura and Mike Batongbacal, "Professional ASP.NET Web Services", Apress,2.

CS9221 DATABASE TECHNOLOGY LT P C
3 0 0 3

UNIT I DISTRIBUTED DATABASES 5

Distributed Databases Vs Conventional Databases – Architecture – Fragmentation – Query Processing – Transaction Processing – Concurrency Control – Recovery.

UNIT II OBJECT ORIENTED DATABASES 10

Introduction to Object Oriented Data Bases - Approaches - Modeling and Design - Persistence – Query Languages - Transaction - Concurrency – Multi Version Locks - Recovery.

UNIT III EMERGING SYSTEMS 10

Enhanced Data Models - Client/Server Model - Data Warehousing and Data Mining - Web Databases – Mobile Databases.

UNIT IV DATABASE DESIGN ISSUES 10

ER Model - Normalization - Security - Integrity - Consistency - Database Tuning - Optimization and Research Issues – Design of Temporal Databases – Spatial Databases.

UNIT V CURRENT ISSUES 10

Rules - Knowledge Bases - Active And Deductive Databases - Parallel Databases – Multimedia Databases – Image Databases – Text Database

TOTAL : 45 PERIODS

REFERENCES:

1. Elisa Bertino, Barbara Catania, Gian Piero Zarri, “Intelligent Database Systems”, Addison-Wesley, 2001.
2. Carlo Zaniolo, Stefano Ceri, Christos Faloustsos, R.T.Snodgrass, V.S.Subrahmanian, “Advanced Database Systems”, Morgan Kaufman, 1997.
3. N.Tamer Ozsu, Patrick Valduriez, “Principles Of Distributed Database Systems”, Prentice Hal International Inc., 1999.
4. C.S.R Prabhu, “Object-Oriented Database Systems”, Prentice Hall Of India, 1998.
5. Abdullah Uz Tansel Et Al, “Temporal Databases: Theory, Design And Principles”, Benjamin Cummings Publishers, 1993.
6. Raghu Ramakrishnan, Johannes Gehrke, “Database Management Systems”, Mcgraw Hill, Third Edition 2004.
7. Henry F Korth, Abraham Silberschatz, S. Sudharshan, “Database System Concepts”, Fourth Ediion, Mcgraw Hill, 2002.
8. R. Elmasri, S.B. Navathe, “Fundamentals Of Database Systems”, Pearson Education, 2004.

CU9222 MULTIMEDIA COMPRESSION TECHNIQUES LT P C
3 0 0 3

UNIT I INTRODUCTION 9

Special features of Multimedia – Graphics and Image Data Representations – Fundamental Concepts in Video and Digital Audio – Storage requirements for multimedia applications -Need for Compression - Taxonomy of compression techniques – Overview of source coding, source models, scalar and vector quantization theory – Evaluation techniques – Error analysis and methodologies

UNIT II TEXT COMPRESSION 9

Compaction techniques – Huffmann coding – Adaptive Huffmann Coding – Arithmatic coding – Shannon-Fano coding – Dictionary techniques – LZW family algorithms.

UNIT III AUDIO COMPRESSION 9

Audio compression techniques - μ- Law and A- Law companding. Frequency domain and filtering – Basic sub-band coding – Application to speech coding – G.722 – Application to audio coding – MPEG audio, progressive encoding for audio – Silence compression, speech compression techniques – Formant and CELP Vocoders

UNIT IV IMAGE COMPRESSION 9

Predictive techniques – DM, PCM, DPCM: Optimal Predictors and Optimal Quantization – Contour based compression – Transform Coding – JPEG Standard – Sub-band coding algorithms: Design of Filter banks – Wavelet based compression: Implementation using filters – EZW, SPIHT coders – JPEG 2000 standards - JBIG, JBIG2 standards.

UNIT V VIDEO COMPRESSION 9

Video compression techniques and standards – MPEG Video Coding I: MPEG – 1 and 2 – MPEG Video Coding II: MPEG – 4 and 7 – Motion estimation and compensation techniques – H.261 Standard – DVI technology – PLV performance – DVI real time compression – Packet Video.

TOTAL: 45 PERIODS

REFERENCES

1. Khalid Sayood : Introduction to Data Compression, Morgan Kauffman Harcourt India, 2nd Edition, 2000.
2. David Salomon : Data Compression – The Complete Reference, Springer Verlag New York Inc., 2nd Edition, 2001.
3. Yun Q.Shi, Huifang Sun : Image and Video Compression for Multimedia Engineering Fundamentals, Algorithms & Standards, CRC press, 2003.
4. Peter Symes : Digital Video Compression, McGraw Hill Pub., 2004.
5. Mark Nelson : Data compression, BPB Publishers, New Delhi,1998.
6. Mark S.Drew, Ze-Nian Li : Fundamentals of Multimedia, PHI, 1st Edition, 2003.
7. Watkinson,J : Compression in Video and Audio, Focal press,London.1995.
8. Jan Vozer : Video Compression for Multimedia, AP Profes, NewYork, 1995

CP9259 WIRELESS SENSOR NETWORKS LT P C
3 0 0 3

UNIT I OVERVIEW OF WIRELESS SENSOR NETWORKS 8

Challenges for Wireless Sensor Networks-Characteristics requirements-required mechanisms, Difference between mobile ad-hoc and sensor networks, Applications of sensor networks- Enabling Technologies for Wireless Sensor Networks.

UNIT II ARCHITECTURES 9

Single-Node Architecture - Hardware Components, Energy Consumption of Sensor Nodes , Operating Systems and Execution Environments, Network Architecture - Sensor Network Scenarios, Optimization Goals and Figures of Merit, Gateway Concepts.

UNIT III NETWORKING OF SENSORS 10

Physical Layer and Transceiver Design Considerations, MAC Protocols for Wireless Sensor Networks, Low Duty Cycle Protocols And Wakeup Concepts - S-MAC , The Mediation Device Protocol, Wakeup Radio Concepts, Address and Name Management, Assignment of MAC Addresses, Routing Protocols- Energy-Efficient Routing, Geographic Routing.

UNIT IV INFRASTRUCTURE ESTABLISHMENT 9

Topology Control, Clustering, Time Synchronization, Localization and Positioning, Sensor Tasking and Control.

UNIT V SENSOR NETWORK PLATFORMS AND TOOLS 9

Operating Systems for Wireless Sensor Networks, Sensor Node Hardware – Berkeley Motes, Programming Challenges, Node-level software platforms, Node-level Simulators, State-centric programming.

TOTAL : 45 PERIODS

REFERENCS

1. Holger Karl & Andreas Willig, " Protocols And Architectures for Wireless Sensor Networks" , John Wiley, 2005.
2. Feng Zhao & Leonidas J. Guibas, "Wireless Sensor Networks- An Information Processing Approach", Elsevier, 2007.
3. Kazem Sohraby, Daniel Minoli, & Taieb Znati, "Wireless Sensor Networks- Technology, Protocols, And Applications", John Wiley, 2007.
4. Anna Hac, "Wireless Sensor Network Designs", John Wiley, 2003.
5. Bhaskar Krishnamachari, "Networking Wireless Sensors", Cambridge Press,2005.
6. Mohammad Ilyas And Imad Mahgaob,"Handbook Of Sensor Networks: Compact Wireless And Wired Sensing Systems", CRC Press,2005.
7. Wayne Tomasi, "Introduction To Data Communication And Networking", Pearson Education, 2007.

CP9260 OPERATING SYSTEM DESIGN LT P C
3 0 0 3

UNIT I OPERATING SYSTEMS OVERVIEW 9

Operating system – Types of Computer Systems - Computer-system operation – I/O structure – Hardware Protection - System components – System calls – System programs – System structure - Process concept – Process scheduling – Operations on processes – Cooperating processes – Interprocess communication – Communication in client-server systems - Multithreading models – Threading issues – Pthreads.

UNIT II PROCESS MANAGEMENT 10

Scheduling criteria – Scheduling algorithms – Multiple-processor scheduling – Real time scheduling – Algorithm Evaluation – Process Scheduling Models - The critical-section problem – Synchronization hardware – Semaphores – Classic problems of synchronization – critical regions – Monitors - System model – Deadlock characterization – Methods for handling deadlocks – Recovery from deadlock

UNIT III STORAGE MANAGEMENT 9

Memory Management – Swapping – Contiguous memory allocation – Paging – Segmentation – Segmentation with paging. Virtual Memory: Background – Demand paging – Process creation – Page replacement – Allocation of frames – Thrashing.

UNIT IV I/O SYSTEMS 9

File concept – Access methods – Directory structure – File-system mounting – Protection - Directory implementation – Allocation methods – Free-space management - Disk scheduling – Disk management – Swap-space management.

UNIT V CASE STUDY 8

The Linux System - History – Design Principles – Kernel Modules – Process Management – Scheduling – Memory management – File systems – Input and Output – Inter-process Communication – Network Structure – Security – Windows 2000 - History – Design Principles – System Components – Environmental subsystems – File system – Networking.

TOTAL: 45 PERIODS

TEXT BOOKS

1. Silberschatz, Galvin and Gagne, “Operating System Concepts”, Sixth Edition, John Wiley & Sons Inc 2002.

REFERENCES

1. Andrew S. Tanenbaum, “Modern Operating Systems”, Second Edition, Addison Wesley, 2001.
2. Gary Nutt, “Operating Systems”, Second Edition, Addison Wesley, 2001.
3. H M Deital, P J Deital and D R Choffnes, “Operating Systems” , Pearson Education, 2004.

CP9267 VISUAL PROGRAMMING LT P C
3 0 0 3

UNIT I WINDOWS PROGRAMMING 8

The windows programming Model – Event driven programming – GUI concepts – Overview of Windows programming – Creating and displaying the window – Message Loop – windows procedure – WM_PAINT message – WM_DESTROY message – Data types – Resources – An Introduction to GDI – Device context – Text output – Scroll Bars – Keyboard – Mouse – Menus.

UNIT II VISUAL BASIC PROGRAMMING 10

Visual Basic Applications – Form and properties – Variables and Constants – Variant type – Procedure scope – Main – Control statements – control arrays – Creating and using Controls – Menus and Dialogs – Programming fundamentals – Objects and instances – Debugging – Responding to mouse events – Drag and Drag drop events Responding to keyboard events – keypress, keyup, keydown events – Using grid control – Graphics controls – shape and line control – File system controls – Common dialog controls – Processing files – Accessing databases with the data controls.

UNIT III VISUAL C++ PROGRAMMING 9

Visual C++ components – Introduction to Microsoft Foundation Classes Library – Getting started with AppWizard – Class Wizard – Event handling – Keyboard and Mouse events - WM_SIZE, WM_CHAR messages - Graphics Device Interface - Pen, Brush, Colors, Fonts - Single and Multiple document interface - Reading and Writing documents - Resources – Bitmaps creation, usage of BMP and displaying a file existing as a BMP.

UNIT IV CONTROLS 9

Dialog Based Applications, controls – Animate control, image list, CRect tracker – Tree control – CtabControl – Dynamic controls – slider control – progress control – Inheriting CTreeView – CRicheditView – Modal Dialog, – Modeless Dialog – CColorDialog – CfileDialog.

UNIT V ADVANCED CONCEPTS 9

Domain Name System – Email – World Wide Web (HTTP) – Simple Status bars – Splitter windows and multiple views – Dynamic Link Library – Data base Management with ODBC – TCP/IP – Winsock and WinInet, – ActiveX control – creation and usage – Container class.

TOTAL :45 PERIODS

TEXT BOOKS

1. Charles Petzold, "Windows Programming", Microsoft press, 1996.
2. J. David Kruglirski, "Programming Microsoft Visual C++", Fifth Edition, Microsoft press, 1998.
3. Marion Cottingham "Visual Basic", Peachpit Press, 1999.

REFERENCES

1. Steve Holzner, "Visual C++ 6 programming", Wiley Dreamtech India Private Ltd., 2003.
2. Kate Gregory "Using Visual C++", Prentice Hall of India Pvt., Ltd., 1999.
3. Herbert Sheildt, "MFC from the Ground Up".
4. Deitel , " Visual Basic 6.0 How To Program", Pearson Education, 1999.

CS9263 AD-HOC NETWORKS L T P C
3 0 0 3

UNIT I AD-HOC MAC 9

Introduction – Issues in Ad-Hoc Wireless Networks. MAC Protocols – Issues, Classifications of MAC protocols, Multi channel MAC & Power control MAC protocol.

UNIT II AD-HOC NETWORK ROUTING & TCP 9

Issues – Classifications of routing protocols – Hierarchical and Power aware. Multicast routing – Classifications, Tree based, Mesh based. Ad Hoc Transport Layer Issues. TCP Over Ad Hoc – Feedback based, TCP with explicit link, TCP-BuS, Ad Hoc TCP, and Split TCP.

UNIT III WSN -MAC 9

Introduction – Sensor Network Architecture, Data dissemination, Gathering. MAC Protocols – self-organizing, Hybrid TDMA/FDMA and CSMA based MAC.

UNIT IV WSN ROUTING, LOCALIZATION & QOS 9

Issues in WSN routing – OLSR, AODV. Localization – Indoor and Sensor Network Localization. QoS in WSN.

UNIT V MESH NETWORKS 9

Necessity for Mesh Networks – MAC enhancements – IEEE 802.11s Architecture – Opportunistic routing – Self configuration and Auto configuration – Capacity Models – Fairness – Heterogeneous Mesh Networks – Vehicular Mesh Networks.

TOTAL : 45 PERIODS

REFERENCES

1. C.Siva Ram Murthy and B.Smanoj, " Ad Hoc Wireless Networks – Architectures and Protocols", Pearson Education, 2004.
2. Feng Zhao and Leonidas Guibas, "Wireless Sensor Networks", Morgan Kaufman Publishers, 2004.
3. C.K.Toh, "Ad Hoc Mobile Wireless Networks", Pearson Education, 2002.
4. Thomas Krag and Sebastin Buettrich, "Wireless Mesh Networking", O'Reilly Publishers, 2007.

CP9264 DISTRIBUTED COMPUTING L T P C
3 0 0 3

UNIT I COMMUNICATION IN DISTRIBUTED ENVIRONMENT 8

Introduction – Various Paradigms in Distributed Applications – Remote Procedure Call – Remote Object Invocation – Message-Oriented Communication – Unicasting, Multicasting and Broadcasting – Group Communication.

UNIT II DISTRIBUTED OPERATING SYSTEMS 12

Issues in Distributed Operating System – Threads in Distributed Systems – Clock Synchronization – Causal Ordering – Global States – Election Algorithms –Distributed Mutual Exclusion – Distributed Transactions – Distributed Deadlock – Agreement Protocols .

UNIT III DISTRIBUTED RESOURCE MANAGEMENT 10

Distributed Shared Memory – Data-Centric Consistency Models – Client-Centric Consistency Models – Ivy – Munin – Distributed Scheduling – Distributed File Systems – Sun NFS.

UNIT IV FAULT TOLERANCE AND CONSENSUS 7

Introduction to Fault Tolerance – Distributed Commit Protocols – Byzantine Fault Tolerance – Impossibilities in Fault Tolerance.

UNIT V CASE STUDIES 8

Distributed Object-Based System – CORBA – COM+ – Distributed Coordination-Based System – JINI.

TOTAL: 45 PERIODS

REFERENCES

1. George Coulouris, Jean Dollimore, Tim Kindberg, "Distributed Systems Concepts and Design", Third Edition, Pearson Education Asia, 2002.
2. Hagit Attiya and Jennifer Welch, "Distributed Computing: Fundamentals, Simulations and Advanced Topics", Wiley, 2004.
3. Mukesh Singh, "Advanced Concepts In Operating Systems", McGrawHill Series in Computer Science, 1994.
4. A.S.Tanenbaum, M.Van Steen, "Distributed Systems", Pearson Education, 2004.
5. M.L.Liu, "Distributed Computing Principles and Applications", Pearson Addison Wesley, 2004.

CP9262 OBJECT ORIENTED SYSTEM DESIGN LT P C
3 0 0 3

UNIT I 10

Introduction to System Concepts - Managing Complex Software — Properties – Object Oriented Systems Development – Object Basics – Systems Development Life Cycle - Rumbaugh Methodology - Booch Methodology - Jacobson Methodology – Unified Process

UNIT II 8

Unified Approach – Unified Modeling Language – Static behavior diagrams – Dynamic behavior diagrams – Object Constraint Language

UNIT III 9

Inception – Evolutionary Requirements – Domain Models – Operation Contracts - Requirements to Design – Design Axioms – Logical Architecture - Designing Objects with Responsibilities – Object Design – Designing for Visibility

UNIT IV 9

Patterns – Analysis and Design patterns – GoF Patterns - Mapping designs to code – Test Driven development and refactoring – UML Tools and UML as blueprint

UNIT V 9

More Patterns – Applying design patterns – Architectural Analysis – Logical Architecture Refinement – Package Design – Persistence framework with patterns

TOTAL : 45 PERIODS

REFERENCES:

1. Craig Larman. "Applying UML and Patterns – An introduction to Object-Oriented Analysis and Design and Iterative Development", 3rd ed, Pearson Education, 2005.
2. Fowler, Martin. UML Distilled. 3rd ed. Pearson Education. 2004.
3. Michael Blaha and James Rumbaugh, "Object-oriented modeling and design with UML", Prentice-Hall of India, 2005.
4. Booch, Grady. Object Oriented Analysis and Design. 2nd ed. Pearson Education. 2000.
5. Ali Bahrami, " Object Oriented Systems Development", Tata McGrawHill, 19

CP9254 SOFT COMPUTING L T P C
3 0 0 3

UNIT I INTRODUCTION TO SOFT COMPUTING AND NEURAL NETWORKS 9

Evolution of Computing - Soft Computing Constituents – From Conventional AI to Computational Intelligence - Machine Learning Basics

UNIT II GENETIC ALGORITHMS 9

Introduction to Genetic Algorithms (GA) – Applications of GA in Machine Learning - Machine Learning Approach to Knowledge Acquisition

UNIT III NEURAL NETWORKS 9

Machine Learning Using Neural Network, Adaptive Networks – Feed forward Networks – Supervised Learning Neural Networks – Radial Basis Function Networks - Reinforcement Learning – Unsupervised Learning Neural Networks – Adaptive Resonance architectures – Advances in Neural networks.

UNIT IV FUZZY LOGIC 9

Fuzzy Sets – Operations on Fuzzy Sets – Fuzzy Relations – Membership Functions- Fuzzy Rules and Fuzzy Reasoning – Fuzzy Inference Systems – Fuzzy Expert Systems – Fuzzy Decision Making

UNIT V NEURO-FUZZY MODELING 9

Adaptive Neuro-Fuzzy Inference Systems – Coactive Neuro-Fuzzy Modeling – Classification and Regression Trees – Data Clustering Algorithms – Rulebase Structure Identification – Neuro-Fuzzy Control – Case studies.

TOTAL : 45 PERIODS

TEXT BOOKS:

1. Jyh-Shing Roger Jang, Chuen-Tsai Sun, Eiji Mizutani, "Neuro-Fuzzy and Soft Computing", Prentice-Hall of India, 2003.
2. George J. Klir and Bo Yuan, "Fuzzy Sets and Fuzzy Logic-Theory and Applications",
3. Prentice Hall, 1995.
4. James A. Freeman and David M. Skapura, "Neural Networks Algorithms, Applications, and Programming Techniques", Pearson Edn., 2003.

REFERENCES:

1. Mitchell Melanie, “An Introduction to Genetic Algorithm”, Prentice Hall, 1998.
2. David E. Goldberg, “Genetic Algorithms in Search, Optimization and Machine Learning”, Addison Wesley, 1997.
3. S. N. Sivanandam, S. Sumathi and S. N. Deepa, “Introduction to Fuzzy Logic using MATLAB”, Springer, 2007.
4. S.N.Sivanandam · S.N.Deepa, “Introduction to Genetic Algorithms”, Springer, 2007.
5. Jacek M. Zurada, “Introduction to Artificial Neural Systems”, PWS Publishers, 1992.