



M.E. COMPUTER SCIENCE AND ENGINEERING

(TWO YEAR FULL TIME)

CURRICULUM 2008

SEMESTER I

Code No	Course Title	L	T	P	C
YCS101	Theory of Computation	3	1	0	4
YCS102	Advanced Computer Architecture	4	0	0	4
YCS103	Advanced Data Structures and Algorithms	3	1	0	4
YCS104	Advanced Operating System	4	0	0	4
YCS1**	Elective I	3	0	0	3
YCS1**	Elective II	3	0	0	3
YCS107	Advanced Data Structures and Algorithms Lab	0	0	4	2
YCS108	Advanced Operating System Lab	0	0	4	2

Total Hours:30

Total Credits:26

SEMESTER II

Code No	Course Title	L	T	P	C
YCS201	Advanced Database System	4	0	0	4
YCS202	Software Engineering	4	0	0	4
YCS203	Network Protocols	4	0	0	4
YCS204	Combinatorics and Graph Theory	3	1	0	4
YCS2**	Elective III	3	0	0	3
YCS2**	Elective IV	3	0	0	3
YCS207	Advanced Database System Lab	0	0	4	2
YCS208	CASE Tools Lab	0	0	4	2

Total Hours: 30

Total Credits:26

SEMESTER III

Code No	Course Title	L	T	P	C
YCS301	Project Work (Phase I)	-	-	24	12

SEMESTER IV

Code No	Course Title	L	T	P	C
YCS301	Project Work (Phase II)	-	-	24	12

Over all Credits:76

LIST OF ELECTIVES

SEMESTER I

**Elective Code	Course Title	L	T	P	C
RESEARCH					
51	Bio informatics	3	0	0	3
52	Image Processing	3	0	0	3
53	Artificial Intelligence	3	0	0	3
54	Fuzzy Logic and Neural Networks	3	0	0	3
NETWORKS					
55	Adhoc Networks	3	0	0	3
56	Network Security	3	0	0	3
57	Network Management	3	0	0	3
DATABASE					
58	Data Warehousing and Data Mining	3	0	0	3
59	Object Oriented System Analysis And Design	3	0	0	3
60	SAP	3	0	0	3
SOFTWARE ENGINEERING					
61	Software Project Management	3	0	0	3
62	Software Reuse	3	0	0	3
63	Software Design	3	0	0	3
64	Software Testing	3	0	0	3
65	Software Documentation	3	0	0	3

SEMESTER II

**Elective Code	Course Title	L	T	P	C
RESEARCH					
66	Robotics	3	0	0	3
67	Nano Technology	3	0	0	3
68	Agent Technology	3	0	0	3
69	Embedded Systems	3	0	0	3
NETWORKS					
70	Cryptography and Steganography	3	0	0	3
71	Next Generation IP Networks	3	0	0	3
72	Wireless Networks	3	0	0	3
DATABASE					
73	Web mining	3	0	0	3
74	Component Based Technology	3	0	0	3
75	Knowledge based Decision Support systems	3	0	0	3
SOFTWARE ENGINEERING					
76	Software Quality Assurance	3	0	0	3
77	Object Oriented Reuse	3	0	0	3
78	Software Agents	3	0	0	3
79	Software Re-Engineering	3	0	0	3
80	Software Reliability and Metrics	3	0	0	3

YCS101 - THEORY OF COMPUTATION

3 1 0 4

UNIT- I FINITE AUTOMATA AND REGULAR LANGUAGES 9

Finite Automata and Regular languages - Regular expressions and Regular languages –non determinism and Kleenes theorem, Equivalence of DFA and NFA, Finite Automation with e-moves, equivalence of regular expression and NFA with e-moves – pumping lemma for regular sets.

UNIT- II CONTEXT FREE LANGUAGES 9

Context free languages, Derivation and languages, Relationship between derivation and derivation trees, Simplification of context free grammars – Normal forms for context free grammars, CNF, and GNF.

UNIT- III PUSH DOWN AUTOMATA 9

Acceptance by PDA, Pushdown automata and Context free languages, Pumping lemma for CFL, deterministic Context free languages and Deterministic pushdown automata.

UNIT- IV TURING MACHINE 9

Context sensitive languages and LBA, Turing machine (Definition and examples), Computable languages and functions, Church Turing hypothesis, Universal Turing machine, P and NP problems, NP-complete.

UNIT- V UNSOLVABLE PROBLEMS 9

Unsolvable problems - Rice Theorem - Post's correspondence Problem, Recursive and recursively enumerable languages.

L:45; T:15; TOTAL:60

REFERENCES:

1. Hopcroft and Ullman, Introduction to Automata, Languages and Computation, Narosa Publishers, 2006
2. A.M.Natarajan, A. Tamilarasi & P.Balasubramani, " Theory of Computation" New age International publishers, 2002
3. John.C.Martin, Introduction to languages and the Theory of Computation, 2nd Edition, McGraw Hill, 1997

YCS103 - ADVANCED DATA STRUCTURES AND ALGORITHMS 3 1 0 4

UNIT- I INTRODUCTION 8

Algorithm Analysis – Efficiency of Algorithm -ADT - List (Singly, Doubly and Circular) Implementation – Array and Pointer.

UNIT- II BASIC DATA STRUCTURES 11

Stacks and Queues – ADT, Implementation and Applications - Trees – General, Binary, Binary Search, Expression Search, AVL, Splay, B-Trees – Implementations - Tree Traversals.

UNIT- III ADVANCED DATA STRUCTURES 10

Set – Implementation – Basic operations on set – Priority Queue – Implementation - Graphs – Directed Graphs – Shortest Path Problem - Undirected Graph - Spanning Trees – Graph Traversals

UNIT- IV MEMORY MANAGEMENT 7

Issues - Managing Equal Sized Blocks - Garbage Collection Algorithms for Equal Sized Blocks - Storage Allocation for Objects with Mixed Sizes - Buddy Systems - Storage Compaction

UNIT-V SEARCHING, SORTING AND DESIGN TECHNIQUES 9

Searching Techniques, Sorting – Internal Sorting – Bubble Sort, Insertion Sort, Quick Sort, Heap Sort, Bin Sort, Radix Sort – External Sorting – Merge Sort, Multi-way Merge Sort, Polyphase Sorting - Design Techniques - Divide and Conquer - Dynamic Programming - Greedy Algorithm – Backtracking - Local Search Algorithms

L: 45; T: 15; TOTAL: 60

REFERNCES:

1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", Pearson Education, 2002.
2. Aho, Hopcroft, Ullman, "Data Structures and Algorithms", Pearson Education, 2002.
3. Horowitz, Sahni, Rajasekaran, "Computer Algorithms", Galgotia, 2000
4. Tanenbaum A.S., Langram Y, Augestien M.J., "Data Structures using C & C++", Prentice Hall of India, 2002

YCS104 - ADVANCED OPERATING SYSTEM

4 0 0 4

UNIT- I

9

Architectures of Distributed Systems - System Architecture types - issues in distributed operating systems - communication networks – communication primitives. Theoretical Foundations - inherent limitations of a distributed system – lamp ports logical clocks – vector clocks – casual ordering of messages – global state – cuts of a distributed computation – termination detection. Distributed Mutual Exclusion – introduction – the classification of mutual exclusion and associated algorithms – a comparative performance analysis.

UNIT- II

9

Distributed Deadlock Detection - Introduction - deadlock handling strategies in distributed systems - issues in deadlock detection and resolution - control organizations for distributed deadlock detection - centralized and distributed deadlock detection algorithms - hierarchical deadlock detection algorithms. Agreement protocols - introduction-the system model, a classification of agreement problems, solutions to the Byzantine agreement problem, applications of agreement algorithms. Distributed resource management: introduction-architecture – mechanism for building distributed file systems – design issues – log structured file systems.

UNIT- III

9

Distributed shared memory-Architecture– algorithms for implementing DSM – memory coherence and protocols – design issues. Distributed Scheduling – introduction – issues in load distributing – components of a load distributing algorithm – stability – load distributing algorithm – performance comparison – selecting a suitable load sharing algorithm – requirements for load distributing -task migration and associated issues. Failure Recovery and Fault tolerance: introduction– basic concepts – classification of failures – backward and forward error recovery, backward error recovery- recovery in concurrent systems – consistent set of check points – synchronous and asynchronous check pointing and recovery – check pointing for distributed database systems- recovery in replicated distributed databases

UNIT- IV

9

Protection and security -preliminaries, the access matrix model and its implementations.-safety in matrix model- advanced models of protection. Data security – cryptography: Model of cryptography, conventional cryptography- modern cryptography, private key cryptography, data encryption standard- public key cryptography – multiple encryption – authentication in distributed systems.

Multiprocessor operating systems - basic multiprocessor system architectures – inter connection networks for multiprocessor systems – caching – hypercube architecture. Multiprocessor Operating System - structures of multiprocessor operating system, operating system design issues- threads- process synchronization and scheduling.

Database Operating systems :Introduction- requirements of a database operating system Concurrency control : theoretical aspects – introduction, database systems – a concurrency control model of database systems- the problem of concurrency control – serializability theory- distributed database systems, concurrency control algorithms – introduction, basic synchronization primitives, lock based algorithms- timestamp based algorithms, optimistic algorithms – concurrency control algorithms, data replication.

L: 60; TOTAL:60

REFERENCES:

1. Mukesh Singhal, Niranjana G.Shivaratri, "Advanced concepts in operating systems: Distributed, Database and multiprocessor operating systems", TMH, 2006
2. Andrew S.Tanenbaum, "Modern operating system", 2nd Edition, PHI, 2007
3. Pradeep K.Sinha, "Distributed operating system-Concepts and design", PHI, 2003.
4. Andrew S.Tanenbaum, "Distributed operating system", Pearson education, 2006

**YCS107 - ADVANCED DATA STRUCTURES AND
ALGORITHMS LABORATORY**

0 0 4 2

1. Implementation linked list .
2. Implementation of Multistack in a Single Array.
3. Implementation of Circular Queue.
4. Implementation of Binary Search trees and Delete an element.
5. Implementation of Hash table.
6. Implementation of Heaps.
7. Implementation of AVL Rotations.
8. Implementation of Breadth First Search & Depth First Search Techniques.
9. Implementation of Prim's & Kruskal's Algorithm.
10. Implementation of Dijkstra's Algorithm.
11. Implementation of Searching Techniques
12. Implementation of Sorting Techniques

YCS108 ADVANCED OPERATING SYSTEMS
LABORATORY

0 0 4 2

1. Implement the following CPU Scheduling Algorithms.
 i) FCFS ii) Round Robin iii) Shortest Job First.
2. Implement the Mutual Exclusion Problem Using Dekker's Algorithm.
3. Implement Inter Process Communication Problem (Producer-Consumer / Reader- Writer Problem) Using Semaphores.
4. Implement Best fit, First Fit Algorithm for Memory Management.
5. Implement Memory Allocation with Pages.
6. Implement FIFO page Replacement Algorithm.
7. Implement LRU page Replacement Algorithm.
8. Implement the creation of Shared memory Segment.
9. Implement File Locking.
10. Implement Banker's algorithm

YCS201 - ADVANCED DATABASE SYSTEM 4 0 0 4

UNIT I DATABASE MANAGEMENT 12

Relational Data Model – SQL - Database Design - Entity-Relationship Model – Relational Normalization – Embedded SQL – Dynamic SQL – JDBC – ODBC.

UNIT II ADVANCED DATABASES 12

Object Databases - Conceptual Object Data Model – XML and Web Data – XML Schema – Distributed Data bases – OLAP and Data Mining – ROLAP and MOLAP

UNIT III QUERY AND TRANSACTION PROCESSING 12

Query Processing Basics – Heuristic Optimization – Cost, Size Estimation - Models of Transactions – Architecture – Transaction Processing in a Centralized and Distributed System – TP Monitor.

UNIT IV IMPLEMENTING AND ISOLATION 12

Schedules – Concurrency Control – Objects and Semantic Commutativity – Locking – Crash, Abort and Media Failure – Recovery – Atomic Termination – Distributed Deadlock – Global Serialization – Replicated Databases – Distributed Transactions in Real World

UNIT V DATABASE DESIGN ISSUES 12

Security – Encryption – Digital Signatures – Authorization – Authenticated RPC - Integrity - Consistency - Database Tuning - Optimization and Research Issues.

L: 60; TOTAL: 60

REFERENCES:

1. Abraham Silberschatz, Henry. F. Korth, S.Sudharsan, Database System Concepts, 5th Edition., Tata McGraw Hill, 2006
2. R. Elmasri and S.B. Navathe, Fundamentals of Database Systems, 3rd Edition, Addison Wesley, 2004
3. Philip M. Lewis, Arthur Bernstein, Michael Kifer, “Databases and Transaction Processing:An Application-Oriented Approach”, Addison-Wesley, 2002
4. Raghu Ramakrishnan & Johannes Gehrke, “Database Management Systems”, III Edition, TMH, 2003

YCS202 - SOFTWARE ENGINEERING 4 0 0 4

UNIT- I INTRODUCTION 12

Software Engineering Process paradigms - Project management - Process and Project Metrics – software estimation - Empirical estimation models - planning - Risk analysis - Software project scheduling.

UNIT- II REQUIREMENTS ANALYSIS 12

Prototyping - Specification - Analysis modeling

UNIT- III SOFTWARE DESIGN 12

Software design - Abstraction - Modularity - Software Architecture - Effective modular design – Cohesion and Coupling - Architectural design and Procedural design - Data flow oriented design.

UNIT- IV USER INTERFACE DESIGN AND REAL TIME SYSTEMS 12

User interface design - Human factors - Human computer interaction - Human - Computer Interface design - Interface design - Interface standards. Programming languages and coding - Language classes – Code documentation - Code efficiency - Software Configuration Management.

UNIT -V SOFTWARE QUALITY AND TESTING 12

Software Quality Assurance - Quality metrics - Software Reliability - Software quality and reliability. SEI CMM, PSP and Six Sigma, Software testing - Path testing – Control Structures testing - Black Box testing - Integration, Validation and system testing - Software Maintenance - Reverse Engineering and Re-engineering, Clean room technique, CASE tools-projects management, tools - analysis and design tools - programming tools - integration and testing tool - Case studies.

L:60; TOTAL: 60

REFERENCES:

1. Roger Pressman.S., Software Engineering : A Practitioner's Approach, 5th Edition, McGraw Hill, 2001 .
2. I. Sommerville, Software Engineering, V edition: Addison Wesley, 2004.
3. Pfleeger, Software Engineering, Prentice Hall, 2000.
4. Carlo Ghezzi, Mehdi Jazayari, Dino Mandrioli Fundamentals of Software Engineering, Prentice Hall of India 2002

YCS203 - NETWORK PROTOCOLS 4 0 0 4

UNIT- I INTRODUCTION TO INTERNETWORKING 12

Internetworking Concepts – Architectural Model – Routing – Internet Addressing – Address Resolution Protocol (ARP) – Reverse Address Resolutions Protocol (RARP) – Bootstrapping – BOOTP – DHCP.

UNIT- II INTERNET PROTOCOL 12

Routing Table and Routing Algorithms – Fragmentation and Reassembling – Error Processing (ICMP) – Multicast Processing (IGMP).

UNIT- III IPv6 12

IP Security Protocol – IPV6 Protocol Basics – Addressing – Multicast – Anycast – ICMPV6 Routing – QOS – Auto configuration

UNIT- IV TRANSMISSION CONTROL PROTOCOL 12

Data Structures Input Processing – Finite State Machine Implementation – Output Processing – Timer Management – Flow Control and Adaptive Retransmission – Urgent Data Processing.

UNIT -V NETWORK MANAGEMENT PROTOCOLS 12

Simple Network Management Protocols (SNMP) v1, SNMP v2, SNMP v3 and Remote Monitoring (RMON).

L:60; TOTAL: 60

REFERENCES:

1. Douglas E Comer “Internetworking with TCP/IP principles protocol and architectures”, 4th edition Volume 1, Pearson Education, 2003.
2. Adrian Farrel, “The Internet and Its Protocols – A Comparative Approach” Morgan Kaufmann, April 2004.
3. Mani Subramanian, " Network Management Principles and practice ", Pearson Education, 2006.
4. W.Richard Stevens “TCP/IP Illustrated, The Protocols. Volume I” ,Pearson Education India 2005.

YCS204 - COMBINATORICS AND GRAPH THEORY 3 1 0 4

UNIT- I COMBINATORICS 9

Basics of counting – Counting arguments – Pigeon hole principle – Permutations and Combinations – Recursion and Recurrence relation – Generating function.

UNIT- II MODELLING COMPUTATION AND LANGUAGES 9

Finite State machines – Deterministic and Non – Deterministic Finite state machines – Turing machines – Formal Languages – Classes of Grammar – Type 0 – Context Sensitive – Context Free – Regular Grammars - Ambiguity.

UNIT- III INTRODUCTION – GRAPHS AND TREES 9

Introduction of graphs, paths cycles and trails, vertex degrees and counting – directed graphs – Trees and Distance: Basic properties, spanning trees and enumeration, optimization and Trees.

UNIT- IV MATCHING CONNECTIVITY AND FLOW 9

Matching and Covers Algorithms and Applications. Matching in General Graphs – Connectivity and Paths: Cuts and Connectivity, k – connected Graphs – Network flow problems.

UNIT- V COLOURING 9

Vertex coloring and upper bounds – Structure of K – Chromatic graphs, Enumerative aspects

L:45; T:15; TOTAL:

REFERENCES:

1. R. J. Wilson “ Introduction to Graph theory” , 4th Edition, Pearson Education 2003.
2. Discrete Mathematics and Its Applications by Kenneth H. Rosen, 5th Edition TMH, 2003.
3. J. P. Tremblay and R. Manohar, “ Discrete Mathematical Structures with applications to Computer Science”, TMH, 1997
4. Narsingh Deo, “ Graph Theory with Application to Engineering and Computer Science, PHI , New Delhi, 1998.

**YCS207- ADVANCED DATABASE SYSTEM
LABORATORY**

0 0 4 2

1. Study of all SQL commands
2. Implement the concept of Normalization
3. Database design using E-R Model
4. Embedded SQL
5. High level language extension with Cursors
6. High level language extension with Triggers
7. Procedures and Functions
8. Implement the inventory control system with a reorder level
9. Develop a package for a bank to maintain its customer details
10. Develop a package for the payroll of a company

YCS208- CASE TOOLS LABORATORY

0 0 4 2

Solving Sample Problems using CASE tools for Problem Analysis and Project Planning, Design, Software Development in forward and reverse engineering methodologies, debugging, Testing and Maintenance

UNIT I DIGITAL IMAGE FUNDAMENTALS**9**

Elements of digital image processing systems, Elements of visual perception, psycho visual model, brightness, contrast, hue, saturation, mach band effect, Color image fundamentals -RGB,HSI models, 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 and specification techniques, Noise distributions, Spatial averaging, Directional Smoothing, Median, Geometric mean, Harmonic mean, Conharmonic and Yp mean filters, Homomorphic filtering, Color image enhancement. 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**

Edge detection. Image segmentation by region growing, region splitting and merging, edge linking.. Image Recognition – Patterns and pattern classes, Matching by minimum distance classifier, Matching by correlation, Back Propagation Neural Network, Neural Network applications in Image Processing.

UNIT V IMAGE COMPRESSION**9**

Need for data compression, Huffman,. Run Length Encoding, Shift codes, Arithmetic coding, Vector Quantization, Block Truncation Coding. Transform Coding – DCT and Wavelet. JPEG ,MPEG. Standards, Concepts of Context based Compression.

Total: 45 Hours**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. David Salomon : Data Compression – The Complete Reference, Springer Verlag New York Inc., 2nd Edition, 2001
4. Rafael C. Gonzalez, Richard E.Woods, Steven Eddins, ' Digital Image Processing using MATLAB', Pearson Education, Inc., 2004.
5. William K.Pratt, ' Digital Image Processing', John Wiley, NewYork, 2002.

6. Milman Sonka, Vaclav Hlavac, Roger Boyle, 'Image Processing, Analysis, and Machine Vision', Brooks/Cole, Vikas Publishing House, II ed., 1999.
7. Sid Ahmed, M.A., 'Image Processing Theory, Algorithms and Architectures', McGrawHill, 1995.

UNIT I INTRODUCTION**8**

Intelligent Agents – Agents and environments - Good behavior – The nature of environments – structure of agents - Problem Solving - problem solving agents – example problems – searching for solutions – uniformed search strategies - avoiding repeated states – searching with partial information.

UNIT II SEARCHING TECHNIQUES**10**

Informed search and exploration – Informed search strategies – heuristic function – local search algorithms and optimistic problems – local search in continuous spaces – online search agents and unknown environments - Constraint satisfaction problems (CSP) – Backtracking search and Local search for CSP – Structure of problems - Adversarial Search – Games – Optimal decisions in games – Alpha – Beta Pruning – imperfect real-time decision – games that include an element of chance.

UNIT III KNOWLEDGE REPRESENTATION**10**

First order logic – representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic - Inference in First order logic – prepositional versus first order logic – unification and lifting – forward chaining – backward chaining - Resolution - Knowledge representation - Ontological Engineering - Categories and objects – Actions - Simulation and events - Mental events and mental objects

UNIT IV LEARNING**9**

Learning from observations - forms of learning - Inductive learning - Learning decision trees - Ensemble learning - Knowledge in learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductive logic programming - EM algorithm - Instance based learning - Reinforcement learning – Passive reinforcement learning - Active reinforcement learning - Generalization in reinforcement learning.

UNIT V APPLICATIONS**8**

Communication – Communication as action – Formal grammar for a fragment of English – Syntactic analysis – Augmented grammars – Semantic interpretation – Ambiguity and disambiguation.

TOTAL : 45**TEXT BOOK**

1. Stuart Russell, Peter Norvig, “Artificial Intelligence – A Modern Approach”, 2nd Edition, Pearson Education / Prentice Hall of India, 2004.

REFERENCES

1. Nils J. Nilsson, “Artificial Intelligence: A new Synthesis”, Harcourt Asia Pvt. Ltd., 2000.

2. Elaine Rich and Kevin Knight, "Artificial Intelligence", 2nd Edition, Tata McGraw-Hill, 2003.
3. George F. Luger, "Artificial Intelligence-Structures And Strategies For Complex Problem Solving", Pearson Education / PHI, 2002.

UNIT I INTRODUCTION

Introduction to Fuzzy Logic: Fuzzy sets - Properties of Fuzzy sets, operations on Fuzzy sets. Extension of Fuzzy set concepts, Fuzzy relations: Cardinality of Fuzzy relations. Linguistic approximation, Fuzzy statements. Fuzzy rule base. Canonical rule formation, Decomposition of compound rules.

UNIT II FUZZY LOGIC CONTROLLER

Functional diagram. Membership functions : Triangular, Trapezoidal-scale motors. Fuzzification membership value assignments using intuition knowledge base. Defuzzification: Max-Membership principle - Centroid method - weighted average method - rule base. Choice of variable - derivation of rules, Fuzzy databases, Case studies

UNIT III ARCHITECTURE

Motivation for the development of neural networks-Artificial neural networks-Biological neural networks- Application –Typical architectures-Setting weights-Common activation functions –McCulloch pitts neuron: Architecture, algorithm, applications-Simple neural networks for pattern classification :Architecture, biases and thresholds, linear separability, data representation –Hebb bet : Algorithm and application –architecture, algorithm and application of perception- perceptron :learning rule convergence theorem-delta rule.

UNIT IV MODELLING

Back Propagation net : Standard back propagation –Architecture-Algorithm-Derivation of learning rules-Number of hidden layers –Learning rules –Number of hidden layers-Learning factors-Applications. Hopfield, continuous nets, Botzmann machine.

UNIT V NEURAL NETWORKS

Neural networks based on competition; fixed weight competitive nets –Kohonen self organizing map and applications –Adaptive resonance theory :Basic architecture and operation-Architecture, algorithm applications and analysis and analysis of ART1 and ART2. Application of neural networks and fuzzy logic to computer science.

Total : 45

TEXT BOOKS

1. Fundamentals of neural networks-Lawrene Fausett Prentice,1994
2. An Introduction to fuzzy control,D.Drianov,H.Hellendoorn,and Reinfrank Narosa Publishing Co.,NewDelhi,1996.

REFERENCES

1. Fuzzy Logic with Engineering Applications ,Timothy J.Rose,McGraw-Hill, Newyork,1996.
2. Fuzzy sets,uncertainty ands information G.J.Klir and T.A Folger- Prentice Hall,1994
3. Introductin to Artificial Neural Systems,J.M.Zurada,Jaico Publishing House,Delhi,1994
4. Understanding Neural Networks and Fuzzy logic-Basic concepts and Applications,Stamatios V,Kartalopoulos,IEEE Press,Newyork,1996.
5. Neural Networks,Simon Haykin,MacMillan College Publishing Co.,Newyork,1994.
6. Neural Fuzzy Systems,Chin-Teng Lin and C.S.George Lee, Prentice
7. Hall,1996

UNIT I INTRODUCTION 9

Introduction-Fundamentals of Wireless Communication Technology - The Electromagnetic Spectrum - Radio Propagation Mechanisms - Characteristics of the Wireless Channel - IEEE 802.11a,b Standard – Origin Of Ad hoc: Packet Radio Networks - Technical Challenges - Architecture of PRNETs - Components of Packet Radios – Ad hoc Wireless Networks -What Is an Ad Hoc Network? Heterogeneity in Mobile Devices - Wireless Sensor Networks - Traffic Profiles - Types of Ad hoc Mobile Communications - Types of Mobile Host Movements - Challenges Facing Ad Hoc Mobile Networks-Ad hoc wireless Internet

UNIT II AD HOC ROUTING PROTOCOLS 9

Introduction - Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks - Classifications of Routing Protocols -Table-Driven Routing Protocols - Destination Sequenced Distance Vector (DSDV) - Wireless Routing Protocol (WRP) - Cluster Switch Gateway Routing (CSGR) - Source-Initiated On-Demand Approaches - Ad Hoc On-Demand Distance Vector Routing (AODV) - Dynamic Source Routing (DSR) - Temporally Ordered Routing Algorithm (TORA) - Signal Stability Routing (SSR) - Location-Aided Routing (LAR) - Power-Aware Routing (PAR) - Zone Routing Protocol (ZRP)

UNIT III MULTICASTROUTING IN AD HOC NETWORKS 9

Introduction - Issues in Designing a Multicast Routing Protocol - Operation of Multicast Routing Protocols - An Architecture Reference Model for Multicast Routing Protocols - Classifications of Multicast Routing Protocols - Tree-Based Multicast Routing Protocols-Mesh-Based Multicast Routing Protocols - Summary of Tree-and Mesh-Based Protocols - Energy-Efficient Multicasting - Multicasting with Quality of Service Guarantees - Application-Dependent Multicast Routing - Comparisons of Multicast Routing Protocols

UNIT IV TRANSPORT LAYER, SECURITY PROTOCOLS 9

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 Protocols for Ad Hoc Wireless Networks - Security in Ad Hoc Wireless Networks - Network Security Requirements - Issues and Challenges in Security Provisioning - Network Security Attacks - Key Management - Secure Routing in Ad Hoc Wireless Networks

UNIT V QoS AND ENERGY MANAGEMENT 9

Introduction - Issues and Challenges in Providing QoS in Ad Hoc Wireless Networks - Classifications of QoS Solutions - MAC Layer Solutions - Network Layer Solutions - QoS Frameworks for Ad Hoc Wireless Networks Energy Management in Ad Hoc Wireless Networks –Introduction - Need for Energy Management in Ad Hoc Wireless Networks - Classification of Energy Management Schemes - Battery Management Schemes - Transmission Power Management Schemes - System Power Management Schemes

REFERENCES:

1. C. Siva Ram Murthy and B.S. Manoj “Ad Hoc Wireless Networks: Architectures and Protocols”, Prentice Hall PTR,2004
2. C.K. Toh, Ad Hoc Mobile Wireless Networks: Protocols and Systems, Prentice Hall PTR ,2001
3. Charles E. Perkins, Ad Hoc Networking, Addison Wesley, 2000

YCSE58 DATA WAREHOUSING AND DATA MINING 3 0 0 3

UNIT I INTRODUCTION 9

Relation To Statistics, Databases- Data Mining Functionalities-Steps In Data Mining Process-Architecture Of A Typical Data Mining Systems- Classification Of Data Mining Systems - Overview Of Data Mining Techniques.

UNIT II DATA PREPROCESSING AND ASSOCIATION RULES 9

Data Preprocessing-Data Cleaning, Integration, Transformation, Reduction, Discretization Concept Hierarchies-Concept Description: Data Generalization And Summarization Based Characterization- Mining Association Rules In Large Databases.

UNIT III PREDICTIVE MODELING 9

Classification And Prediction: Issues Regarding Classification And Prediction-Classification By Decision Tree Induction-Bayesian Classification-Other Classification Methods-Prediction-Clusters Analysis: Types Of Data In Cluster Analysis-Categorization Of Major Clustering Methods: Partitioning Methods –Hierarchical Methods

UNIT IV DATA WAREHOUSING 9

Data Warehousing Components -Multi Dimensional Data Model- Data Warehouse Architecture-Data Warehouse Implementation- -Mapping The Data Warehouse To Multiprocessor Architecture- OLAP.-Need- Categorization Of OLAP Tools.

UNIT V APPLICATIONS 9

Applications of Data Mining-Social Impacts Of Data Mining-Tools-An Introduction To DB Miner-Case Studies-Mining WWW-Mining Text Database-Mining Spatial Databases.

Total No of Periods: 45

REFERENCES:

1. Jiawei Han, Micheline Kamber, "Data Mining: Concepts and Techniques", Morgan Kaufmann Publishers, 2002.
2. Alex Berson, Stephen J. Smith, "Data Warehousing, Data Mining, & OLAP", Tata McGraw- Hill, 2004.
3. Usama M. Fayyad, Gregory Piatetsky - Shapiro, Padhraí Smyth And Ramasamy Uthurusamy, "Advances In Knowledge Discovery And Data Mining", The M.I.T Press, 1996.
4. Ralph Kimball, "The Data Warehouse Life Cycle Toolkit", John Wiley & Sons Inc., 1998.
5. Sean Kelly, "Data Warehousing In Action", John Wiley & Sons Inc., 1997.

YCSE59 OBJECT ORIENTED SYSTEM ANALYSIS AND DESIGN 3 0 0 3

UNIT I OBJECT ORIENTED DESIGN FUNDAMENTALS 9

The Object Model-Classes and Objects-Complexity-Classifications-Notation- Process-Pragmatics-Object types-Object State-OOSD life cycle.

UNIT II OBJECT ORIENTED ANALYSIS 9

Overview of Object analysis-Shaller/Mellor,Coad/Yourdon,Rumbaugh,Booch-Object Analysis Classification-Noun Phrase approach-Common class patterns approach-Use-Case Driven approach-classes, Responsibilities, and Collaborators.

UNIT III OBJECT ORIENTED DESIGN METHODS 9

UML-Class diagram-Use-Case diagram-Dynamic Modeling-Extensibility-Comparison with other design methods.

UNIT IV OBJECT ORIENTED DEVELOPMENT 9

OO Design process and Axioms-Designing Classes-Access Layer-View Layer-Testing

UNIT V CASE STUDIES IN OBJECT ORIENTED DEVELOPMENT 9

Total 45

TEXTBOOKS

1. Ali Bahrami," Object Oriented Systems Development",McGraw Hill Internaional Edition.1999.
2. Craig Larman," Applying UML and patterns ",Addison Wesley, 2000.

REFERNCES

1. Booch Grady, "Object Oriented Analysis and Design", Addison Wesley, 5th Edition, 1997
2. "The Unified Modeling Language User Guide",Grady Booch,James Rumbaugh,IVAR Jacobson.Addison-Wesley Longman,1999.
3. Fowler,"Analysis Patterns",Addison Wesley,1996.
4. Shlaer, S., Mellor, S.; 'Object Lifecycles: Modeling the World in States'; Prentice Hall; 1992
5. Coad, P., Yourdon, E.; 'Object-Oriented Analysis'; Yourdon Press, Prentice Hall, New Jersey; 1990
6. Graham, I; 'Object Oriented Methods'; Addison-Wesley; 1993

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UNIT I	INTRODUCTION	9
	Conventional Software Management – Evolution of Software Economics – Improving Software Economics – Conventional versus Modern Software Project Management	
UNIT II	SOFTWARE MANAGEMENT PROCESS FRAMEWORK	9
	Lifecycle Phases – Artifacts of the Process – Model Based Software Architectures – Workflows of the Process – Checkpoints of the Process	
UNIT III	SOFTWARE MANAGEMENT DISCIPLINES	9
	Iterative Process Planning - Organisation and Responsibilities – Process Automation – Process Control and Process Instrumentation – Tailoring the Process	
UNIT IV	MANAGED AND OPTIMIZED PROCESS	9
	Data Gathering and Analysis : Principles of Data Gathering, Data Gathering Process , Software Measures , Data Analysis - Managing Software Quality – Defect Prevention	
UNIT V	CASE STUDIES	9
	COCOMO Cost Estimation Model – Change Metrics – CCPDS-R	

TOTAL : 45

REFERENCES

1. Walker Royce “Software Project Management – A Unified Framework “, Pearson Education, 2004
2. Humphrey, Watts: " Managing the software process ", Addison Wesley, 1989
3. Ramesh Gopaldaswamy, “Managing Global Projects”, Tata McGraw Hill, 2001.
4. Bob Hughes, Mikecoterrell, “Software Project Management”, 3rd Edition, Tata McGraw Hill, 2004.

