5th SEMESTER MCA

F.M.- 70

MCA-301 **INTERNET TECHNOLOGY (3-1-0)Cr.-4**

Module I (10 hrs)
Internet architecture: Internet overview, evolution of internet. Internet components – Local Area Networks, Access Networks, Core Networks, Routers, Transmission infrastructure, ISPs. Packet switching fundamentals-Packet Switching versus Circuit Switching, Connectionless packet switching (IP). Internet Standards: Standards bodies and the standards process, IETF, ITU, IEEE, ATM Forum.

Module II (10 hrs)
Networking protocols: Network Protocol Overview: What are networking protocols, and what do they do? Key protocol architectures. IP Network Overview: What are the key IP network capabilities? How will these capabilities adapt to future network? IP protocol operation. IP addressing: IP address classes. Why are IP addresses under pressure, and what fixes are in place? TCP Fundamentals: How does TCP shield end users from IP network problems? TCP protocol operation and capabilities. TCP/IP: routing.

Module III (10 hrs)
Access Methods and Internet working: Access Network Architectures: Access network characteristics. Differences between Access Networks, Local Area Networks and Wide Area Networks. Access Technologies: Why there is an upper limit on modem speeds. Voice grade modems, ADSL, Cable Modems, Frame Relay. DNS: Domain Names. Resolving Domain Names to IP addresses (DNS operation). Registering Domain Names and solving Domain name disputes. Routing: How the key IP routing protocols (OSPF and BGP4) operate. Implications of future Internet growth on routing protocol performance.

Module IV (10 hrs)
Internet applications: FTP, Telnet, Email, Chat. World Wide Web: HTTP protocol. Search Engines. E-Commerce and security issues including symmetric and asymmetric key, encryption and digital signature, and authentication. Emerging trends, Internet telephony, virtual reality over the web, etc. Intranet and extranet, firewall.

Books:

1. Data & Computer Communications, By William Stallings
2. Computer Networks, A system approach By Larry L.Peterson, Bruce S. Davie
3. Internetworking with TCP / IP, Principles, Protocols & Architecture, By Douglas E.Comer.
4. TCP / IP – clearly Explained – by Pete Loshin, Morgan Kaufmann Publishers.
5. TCP / IP Network Administration by Craig Hunt, Shroff Publishers & Distributors Pvt.Ltd.
6. The Internet and its protocols – A Comparative Approach, by A.Farrel I Elseviers, (Morgan Kaufmann Publishers).

5th SEMESTER MCA

F.M.- 70

MCA-302 **SIMULATION & MODELING (3-1-0)Cr.-4**

Module I (10 hrs)

Inventory Concept: The technique of Simulation, Major application areas, concept of a System, Environment, Continuous and discrete systems, systems modeling types of models progress of a Simulation Study, Monte Carlo Method, Comparison of Simulation and Analytical Methods. Numerical Computation Technique for discrete and continuous models, Continuous System Simulation.

Module II (10 hrs)

Probability Concepts in Simulation : Stochastic variables, Discrete and Continuous Probability Functions, Numerical evaluation of continuous probability functions, continuous uniformly distributed random numbers, Random Number Generators – Linear congruential Generator, Mid Square Method, Multiplicative Congruential generator, rejection Method, Testing of random Numbers, Generation of Stochastic variates, Arrival Patterns Service times.

Module III (10 hrs)

Discrete System Simulation and GPSS: Discrete Events, Representation of Time, generation of arrival patterns, fixed time step versus next event simulation, Simulation of a Telephone System, delayed calls. Introduction to GPSS : Creating and moving transactions, queues, facilities and storages, gathering statistics, conditional transfers, program control statements, priorities and parameters, standard numerical attributes, functions, gates, logic switches and tests, Variables, Select and Count.

Module IV (10 hrs)

Simulation Languages and Practical Systems: Continuous and discrete systems languages, factors in the section of discrete systems simulation language. Computer model of queuing, inventory and scheduling systems. Design and Evaluation of simulation Experiments: Length of simulation runs, validation, variance reduction techniques, experimental layout, analysis of simulation output, Recent trends and developments.

Books:

1. System Simulation – Geoffrey Gordon, 2nd Edition, PHI
2. System Simulation with Digital computer – Narsingh Deo, PHI

5th SEMESTER MCA

F.M.- 70

MCA-303 COMPILER DESIGN (3-1-0)Cr.-4

Introduction to Compiling:

Compilers, Analysis of the source programe, The phases of a compiler, Cousins of the compiler, The grouping of phases, Compiler-construction tools

A Simple One-Pass Compiler:

Overview, Syntax definition, Syntax-directed translation, Parsing, A translator for simple expressions, Lexical analysis, Incorporating a symbol table, Abstract stack machines, Putting the techniques together

Lexical Analysis:

The role of the lexical analyzer, Input buffering, Specification of tokens, Recognition of tokens, A language for specifying lexical analyzers, Finite automata, From a regular expression to an NFA, Design of a lexical analyzer generator, Optimization of DFA-based pattern matchers

Syntax Analysis:

The role of the parser, Context-free grammars, Writing a grammar, Top-down parsing, Bottom-up parsing, Operator-precedence parsing, LR parsers, Using ambiguous grammars, Parser generators

Syntax-Directed Translation:

Syntax-directed definitions, Construction of syntax trees, Bottom-up evaluation of S-attributed definitions, L-attributed definitions, Top-down translation, Bottom-up evaluation of inherited attributes, Recursive evaluators, Space for attribute values at compile time, Assigning space at compile time, Analysis of syntax-directed definitions

Type Checking:

Type systems, Specification of a simple type checker, Equivalence of type expressions, Type conversions, Overloading of functions and operators, Polymorphic functions, An algorithm for unification

Run-Time Environments:

Source language issues, Storage organization, Storage-allocation strategies, Access to nonlocal names, parameter passing, Symbol tables, Language facilities for dynamic storage allocation, Dynamic storage allocation techniques, Storage allocation in Fortran

Intermediate Code Generation:

Intermediate languages, Declarations**,** Assignment statements, Boolean expressions, Case statements, Back Patching, Procedure calls

Code generation:

Issues in the design of a code generator, The target machine, Run-time storage management, Basic blocks and flow graphs, Next-use information, A Simple code generator, Register allocation and assignment, The dag representation of basic blocks, Peephole optimization, Generating code from dags, Dynamic programming code-generation algorithm, Code-generator generators

Code Optimization:

Introduction, The Principal sources of optimization, Optimization of basic blocks, Loops in flow graphs, Introduction to global data-flow analysis, Iterative solution of data-flow equations, Code-improving transformations, Dealing with aliases, Data-flow analysis of structured flow graphs, Efficient data-flow algorithms, A tool for data-flow analysis, Estimation of types, Symbolic debugging of optimized code.

Text Book:

1. Compilers Principles, Techniques, & Tools, by A.V.Aho, R.Sethi & J.D.Ullman, Pearson Education

2. Principle of Compiler Design, A.V.Aho and J.D. Ullman, Addition - Wesley

3. Principle of Compiler Design, A.V.Aho and Rabi Sethi, Addition - Sesley

5th SEMESTER MCA

F.M.- 70

MCA-304 **ENTERPRISE WEB-BASED COMPUTING WITH JAVA (3-1-0)Cr.-4**

Module I (10 hrs.)

Designing web pages: HTML, Forms, CGI Scripts and Clickable Maps

Module II (10 hrs.)

Designing web application: JAVA Applets, JAVA Scripts, JAVA servlets

Module III (10 hrs.)

JAVA Server pages, JAVA server faces, Struts, Perl, DHTML, XML
Web based application architecture: JSP model 1, MVC Architecture, Struts

Module IV (10 hrs.)

J2EE 1.3 including RMI, EJB, JDBC, SERVLETS, JNDI, JTA, JAAS, JMS, JAVA Mail etc.

Text Books:

1. Web Technologies – I & II by Ivan Byross
2. Java Server Programming J2EE 1.3 Edition.
3. Web Technologies – A developer's Perspective by N.P.Gopalan and J.Akilandeswari, PHI.
4. Multimedia and Web Technology – by R. Bangia – Fire Wall Media, New Delhi.

5th SEMESTER MCA
ELECTIVE – I

F.M.- 70

MCA-306 **COMPUTER SECURITY (3-1-0)Cr.-4**

Module I (10 hrs.)

The Security Problem in Computing:
The meaning of computer Security, Computer Criminals, Methods of Defense, Elementary Cryptography: Substitution Ciphers, Transpositions, Making "Good" Encryption algorithms, The Data Encryption Standard, The AES Encryption Algorithms, Public Key Encryptions, Uses of Encryption.

Module II (10 hrs.)

Program Security:
Secure Programs, Nonmalicious Program Errors, viruses and other malicious code, Targeted Malicious code, controls Against Program Threats, Protection in General-Purpose operating system protected objects and methods of protection memory and addmens protection, File protection Mechanisms, User Authentication Designing Trusted O.S: Security polices, models of security, trusted O.S design, Assurance in trusted O.S. Implementation examples.

Module III (10 hrs.)

Data base Security:
Security requirements, Reliability and integrity, Sensitive data, Inference, multilevel database, proposals for multilevel security.

Security in Network:
Threats in Network, Network Security Controls, Firewalls, Intrusion Detection Systems, Secure E-Mail.

Module IV (10 hrs.)

Administering Security:
Security Planning, Risk Analysis, Organizational Security policies, Physical Security. Legal Privacy and Ethical Issues in Computer Security: Protecting Programs and data, Information and the law, Rights of Employees and Employers, Software failures, Computer Crime, Praia, Ethical issues in Computer Security, case studies of Ethics.

Text Books:

1. Security in Computing – (3rd Edition) Charles P.Pfleeger, Shari Lawrence Pfleeger. PHI.
2. Cryptography and Network Security – by A. Kahate – TMH.

Referemce Book:

1. Cyber Security Operations Handbook – by J.W.Rittiaghouse and William M.Hancok – Elseviers.

5th SEMESTER MCA

F.M.- 70

MCA-307 **IMAGE PROCESSING (3-1-0)Cr.-4**

Module I (8 hrs.)
Digital Image Representation, Digital Image Processing System, Visual Perception, Sampling and Quantization, relationship between Pixels, Fourier Transforms, Walsh, Hadamard and Discrete Cosine Transforms.

Module II (8 hrs.)
Spatial and Frequency domain methods, Enhancement by point Processing, Spatial Filtering, Enhancement in the Frequency Domain, Generation of Spatial Masks from Frequency Domain Specifications, Color Image Processing.

Module III (8 hrs.)
Image Restoration

Degradation Model, Diagonalization of Circulant and Block Circulant of Matrices. Algebraic Approach to Restoration, Inverse Filtering, Least Mean Square Filter, Constrained Least squares restoration, Iterative Restoration, Restoration in the Spatial Domain.

Module IV (16 hrs.)
Image Compression

Fundamentals, Image Compression Models, Elements of Information Theory, Error-Free Compression, Image Compression Standards.

Image Segmentation

Detection of Discontinuity, Edge linking and Boundary Detection, Thresholding, Region-Oriented Segmentation, The use of Motion in Segmentation.

Text Books:

1. Digital Image Processing - R.C.Gonzalez & R.E.Wood, Addison Wesley

Reference Books:

1. Digital Image Processing and Analysis – by B.Channda & D.Dutta, PHI.
2. Fundamentals of Digital Image Processing – by A.K.Jain – PHI.
3. Fundamentals of Electronic Image Processing – by A.K.Weeks Jr., PHI.

5th SEMESTER MCA

F.M.- 70

MCA-308 **ARTIFICIAL INTELLIGENCE (3-1-0)Cr.-4**

Module I (10 hrs.)

Introduction to Artificial Intelligence: The Foundations of Artificial Intelligence, The History of Artificial Intelligence, and the State of the Art. Intelligent Agents: Introduction, How Agents should Act, Structure of Intelligent Agents, Environments. Solving Problems by Searching: problem-solving Agents, Formulating problems, Example problems, and searching for Solutions, Search Strategies, Avoiding Repeated States, and Constraint Satisfaction Search. Informed Search Methods: Best-First Search, Heuristic Functions, Memory Bounded Search, and Iterative Improvement Algorithms.

Module II (10 hrs.)

Agents That Reason Logically; A Knowledge-Based Agent, The Wumpus World Environment, Representation, Reasoning & Logic prepositional Logic : A very simple Logic, An agent for the Wumpus World.

First-Order Logic; Syntax and Semantics, Extensions and National, Variations, using First Order Logic, Logical Agents for the Wumpus World, A Simple Reflex Agent, Representing Charge in the World, Deducing Hidden Properties of the World, Preferences Among Actions, Toward A Goal-Based Agent.

Building a Knowledge Base; Properties of Good and Bad Knowledge Bases, Knowledge Engineering. The Electronic Circuits Domain, General Outology, The Grocery Shopping World. Inference in First-Order Logic : Inference Rules Involving Quantifiers, An Example Proof. Generalized Modus Ponens, Forward and Backward, Chaining & Completeness, Resolution: A complete Inference Procedure, Completeness of Resolution.

Module III (10 hrs.)

Planning A Simple Planning Agent Form Problem Solving to Planning. Planning in Situation Calculus. Basic Representations for Planning. A Partial-Order planning Example, A partial Order planning algorithm, Planning With partially Instantiated Operators, Knowledge Engineering for Planning.

Making Simple Decision: Combining Beliefs and desires under uncertainty. The Basis of Utility Theory, Utility Functions. Multi attribute utility Functions, Decision Networks. The Value of Information. Decision – Theoretic Expert Systems.

Learning in Neural and Belief Networks' How the Brain Works, Neural Networks, perceptions, Multi-layered Feed Forward Networks Applications Back propagation algorithm Applications of Neural Networks.

Module IV (10 hrs.)

Knowledge in Learning: Knowledge in Learning, Explanation-based Learning, Learning Using Relevance Information, Inductive Logic Programming. Agents that Communicate: Communication as action, Types of Communicating Agents, A Formal Grammar for A subset of English Syntactic Analysis (Parsing), Definite Clause Grammar (DCG), Augmenting A Grammar. Semantic Interpretation. Ambiguity and Disambiguation. A Communicating Agent. Practical Natural Language processing Practical applications. Efficient Parsing Scaling up the lexicon. Scaling up the Grammar Ambiguity. Discourse Understanding.

Books:

1. Russell S.J. & Norvig P, Artificial Intelligence – A modern Approach (ISBN 0-131-038-052) Prentice Hall Inc, 2002.
2. Winston P.H, Artificial Intelligence (3rd Edigion), McGraw Hill.
3. E.Rich and K.Knight, Artificial Intelligence, - TMH

5th SEMESTER MCA

F.M.- 70

MCA-309 **PARALLEL COMPUTING (3-1-0)Cr.-4**

Module I (10 hrs.)
Introduction to Parallel Computing: Motivating Parallelism, Scope of Parallel Computing. Parallel Programming Platforms : Implicit Parallelism, Limitation of Memory System Performance, Dichotomy of Parallel Computing Platforms, Physical Organization of Parallel Platforms, Communication Costs of Parallel Machines, Routing Mechanism for Interconnection Networks, Impact of Process-Processor Mapping and Mapping Techniques.

Module II (10 hrs.)
Principles of Parallel Algorithm Design : Preliminaries, Decomposition Techniques, Characteristics of Tasks and Interactions, Mapping Techniques for Load Balancing, Methods for containing Interaction Overheads, Parallel Algorithm Models.
Analytical Modeling of Parallel Programs : Sources of Overhead in Parallel Programs, Performance metrics for parallel systems, the effect of Granularity on Performance, Scalability of Parallel Systems, Minimum Execution time and minimum Cost-optional Execution Time, Asymptotic Analysis of Parallel Programs, other Scalability Metrics.

Module III (10 hrs.)
Basic Communication Operations : One-to-All Broadcast and All-to-One Reduction, All-to-All shift. Introduction to MPI : Principles of Message – Passing Programming, The Building Blocks (Send and Receive Operations), MPI (the Message Passing Interface), Collective Communication and Computation Operations, Examples of Matrix – Matrix Multiplication, One dimensional Matrix Vector Multiplication using MPI.

Module IV (10 hrs.)
Matrix Vector Multiplication, Matrix – matrix multiplication (a simple parallel Algorithm, Cannon's Algorithm), A simple Gaussian Elimination Algorithm, Solving a Triangular System (Back Substitution)

Issues in Sorting on Parallel Computers, Odd-Even Transposition, Quicksort.

Books:

1. Introduction to Parallel Computing (2nd Edition) by Ananth Gramma, Anshul Gupta, George Karypis & Vipin Kumar (Pearson)
2. Advanced Computer Architecture – by Kai Hwang.- McGraw Hill.
3. Parallel Computer Architecture – by D.E. Culler, J.P.Singh – Morgan Kaufmann.(Elseviers).

5th SEMESTER MCA

F.M.- 70

MCA-310 **SOFT COMPUTING (3-1-0)Cr.-4**

Module I (10 hrs.)

Neural Networks : Fundamentals of Neural Networks: Models of an artificial Neuron, Neural Network Architecture, Learning methods

Back Propagation Networks: Architecture of a Back propagation Network: back propagation, Learning Effect of Tunning parameters of the Back propagation Neural Network, variation of standard Back Propagation Algorithms.

Module II (10 hrs.)

Associative memory: Auto correlators, Kosko's Discrete BAM, Exponential BAM, Associative memory for Real-coded Pattern Pairs, Applications.

Adaptive Resonance Theory:
ART1, ART2, Applications

Module III (10 hrs.)
FUZZY LOGIC
Fuzzy set theory: crisp sets, fuzzy sets, crisp relations, fuzzy relations, Fuzzy Systems: Crisp logic predicate logic, fuzzy logic, fuzzy Rule based system, Defuzzification Methods.

GENETIC ALGORITHMS
Fundamentals of genetic algorithms: Encoding, Fitness functions, Reproduction.
Genetic Modeling:
Cross cover, Inversion and deletion, Mutation operator, Bit-wise operators, Bitwise operators used in GA. Convergence of Genetic algorithm. Applications, Real life Problems.

Module IV (10 hrs.)
Hybrid Systems:
Hybrid system, neural Networks, fuzzy logic and genetic algorithms hybrids.
Genetic Algorithm based Back propagation Networks: GA based weight determination applications: Fuzzy Back Propagation Networks, Fuzzy Associative Memories: Single Association FAM, Fuzzy Hels FAMS, Fuzzy logic controlled genetic Algorithms soft computing tools, Fuzzy constraints, GA in fuzzy logic controller design, Applications.

Books:

1. Neural Networks, Fuzzy Logic, and Genetic Algorithm (Synthesis and Application) S.Rajasekaran, G.A. Vijayalakshmi Pai, PHI
2. Neuro – Fuzzy and Softcomputing – by JSR Jang, C.T.Sun, E.Mitzutani, PHI.

5th SEMESTER MCA

F.M.- 70

MCA-311 **BIO INFORMATICS (3-1-0)Cr.-4**

Module I (10 hrs)

Introduction to Genomic data and Data Organization: Sequence Data Banks – introduction to sequence data banks – protein sequence data bank. NBFR-PIR. SWISSPORT. Signal peptide data bank, Nucleic acid sequence data bank – GenBank, EMBL nucleotide sequence data bank. AIDS virus sequence data bank. PRNA data bank, structural data banks- protein Data Bank (PDB). The Cambridge Structural Database (CSD) : Genome data bank – Metabolic pathway data; Microbial and Cellular Data Bank.

Module II (10 hrs)

Introduction to MSDN (Microbial Strain Data Network) : Numerical Coding Systems of Microbes, Hibridoma Data Bank Structure, Virus Information System Cell line information system; other important Data banks in the area of biotechnology/life sciences/biodiversity.

Sequence analysis: Analysis Tools for Sequence Data Bank: Pair wise alignment – NEEDLEMAN and Wunsch algorithm, Smith Waterman, BLAST, FASTA algorithms to analyze sequence data; Sequence patterns motifs and profiles.

Module III (10 hrs)

Secondary Structure Predictions; prediction algorithms; Chao-Fasman algorithm. Hidden-Markov model, Neural Networking.

Tertiary Structure predictions; prediction algorithms; Chao-Fasman algorithm. Hidden-Markov model, Neural Networking.

Module IV (10 hrs)

Application in Biotechnology : Protein classifications, Fold libraries, Protein structure prediction : Fold recognitions (threading), protein structure predictions : Comparative modeling (Homology), Advanced topics : Protein folding, Protein-ligand interactions, Molecular Modeling & Dynamics, Drug Designing.

Text Books:

1. Introduction to Bio Informatics, Lesk OUP
2. Introduction to Bio-informatics, Atwood, Pearson Education
3. Developing Bio-informatics Computer Skills, Cynthia Gibas andd Per Jambeck. 2001 SPD
4. Murty CSV, Bioinformatics, Himalaya
5. Bio informatics – Methods & Applications by S.C.Rasogi, N.Mendiratta, P.Rastogi, 2nd Edition, PHI.

5th SEMESTER MCA

F.M.- 70

MCA-305 **DATA MINING AND WARE HOUSING (3-1-0)Cr.-4**

1. Data Mining Functionalities – What Kinds of Patterns Can Be Mined? Classification of DataMining Systems, Major Issues in Data Mining, Summary.

2. Data Warehouse and OLAP Technology for Data Mining – What is a Data Warehouse? Differences between Operational Database Systems and Data Warehouses, But, Why have a separate Data Warehouse, A Multidimensional Data Model, Data Warehouse Architecture, Steps for the Design and Construction of Data Warehouses, A Three-Tier Data Warehouse Architecture, Types of OLAP Servers: ROLAP versus MOLAP versus HOLAP, Data Warehouse Implementation, Efficient Computation of Data Cubes, Indexing OLAP Data, Efficient Processing of OLAP Queries, Metadata Repository, Data Warehouse Back-Eng Tools and Utilities, Further Development of Data Cube Technology, Discovery-Driven Exploration of Data Cubes, Complex Aggregation at Multiple Granularities: Multifeature Cubes, Other Developments, From Data Warehousing to Data Mining.
3. Data Preprocessing – Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

4. Data Mining Primitives, Languages, and System Architectures – Data Mining Primitives: What Defines a Data Mining Task? Task-Relevant Data, The Kind of Knowledge to be Mined, Background Knowledge: Concept Hierarchies, Interestingness Measures, Presentation and Visualizatioin of Discovered Patterns, A Data Mining Query Language, Syntax for Task-Relevant Data Specification, Syntax for Specifying the Kind of Knowledge to be Mined, Syntax for Concept Hierarchy Specification, Syntax for Interestingness Measure Specification, Syntax for Pattern Presentation and Visualization Specification, Putting it All Together-An Example of a DMQL Query, Architectures of Data Mining Systems.

5. Concept Description: Characterization and Comparison, What is Concept Description, Data Generalization and Summarization-Based Characterization, Attribute-Oriented Induction, Efficient Implementation of Attribute-Oriented Induction, Presentation of the Derived Generalization, Analytical Characterization: Analysis of Attribute Relevance, Why Perform Attribute Relevance Analysis? Methods of Attribute Relevance Analysis, Analytical Characterization: An Example, Mining Class Comparisons: Discriminating between Different Classes, Class Comparison Methods and Implementations, Presentation of Class Comparison Descriptions, Class Description: Presentation of Both Characterization and Comparison, Mining Descriptive Statistical Measures in Large Database, Measuring the Central Tendency, Measuring the Dispersion of Data, Graph Displays of Basic Statistical Class Descriptions.

6. Mining Association Rules in Large Databases, Association Rule Mining, Market Basket Analysis: A Motivating Example for Association Rule Mining, Basic Concepts, Association Rule Mining A Road Map, Mining Single-Dimensional Boolean Association Rules from Transactional Database, The Apriori Aalgorithm: Finding Frequent Itemsets Using Candidate Generation, Generating Association Rules from Frequent Itemsets, Improving the Efficienty of Apriori, Mining Frequent

Itemsets without Candidate Generation, Iceberg Queries, Mining Multilevel Association Rules from Transaction Databases, Multilevel Association Rules, Approaches to Mining Multilevel Association Rules, Checking for Redundant Multilevel Association Rules, Mining Multidimensional Association Rules for Relational Database and Data Warehouses, Multidimensional Association Rules, Mining Multidimensional Association Rules Using Static Discretization of Quantitative Attributes, Mining Quantitative Association Rules, Mining Distance-Based Association Rules, From Association Mining to Correlation Analysis, Strong Rules Are Not Necessarily Interesting: An Example, From Association Analysis to Correlation Analysis, Constraint-Based Association Mining, Metarule-Guide3d Mining of Association Rules, Mining Guided by Additional Rule Constraints.

7. Classification and Prediction – What is Classification? What Is Prediction? Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Decision Tree Induction, Tree Pruning, Extracting Classification Rules from Decision Trees, Enhancements to Basic Decision Tree Induction, Scalability and Decision Tree Induction, Integrating Data Warehousing Techniques and Decision Tree Induction, Bayesian Classification, Bayes Theorem, Naïve Bayesian Classification, Bayesian Belief Networks, Training Bayesian Belief Networks, Classification by Backpropagation, A Multilayer Feed-Forward Neural Network, Defining a Network Topology, Classification Based of Concepts from Association Rule Mining, Other Classification Methods, k-Nearest Neighbor Classifiers, Case-Based Reasoning, Genetic Algorithms, Rough Set Approach, Fuzzy Set Approachs, Prediction, Linear and Multiple Regression, Nonlinear Regression, Other Regression Models, Classifier Accuracy, Estimating Classifier Accuracy, Increasing Classifier Accuracy, Is Accuracy Enough to judge a Classifier.

8. Cluster Analysis – What Is Cluster Analysis, Types of Data in Cluster Analysis, Interval-Scaled Variables, Binary Variables, Nominal, Ordinal, and Ratio-Scaled Variables, Variables of Mixed Types, A Categorization of Major Clustering Methods, Classical Partitioning Methods: k-Means and k-Medoids, Partitioning Methods in Large Databases: From k-Medoids to CLARANS, Hierarchical Methods, Agglomerative and Divisive Hierarchical Clustering, BIRCH: Balanced Iterative Reducting and Clustering Using Hierarchies, CURE: Clustering Using Representatives, Chameleon: A Hierarchical Clustering Algorithm Using Dynamic Modeling, Density-Based Methods, DBSCAN: A Density-Based Clustering Method Based on Connected Regions with Sufficiently High Density, OPTICS: Ordering Points To Identify the Clustering Structure, DENCLUE: Clustering Based on Density Distribution Functions, Grid-Based Methods, STING: Statistical Information Grid, WaveCluster: Clustering Using Wavelet Transformation, CLIQUE: Clustering High-Dimensional Space, Model-Based Clustering Methods, Statistical Approach, Neural Network Approach.

9. Multidimensional Analysis and Descriptive Mining of Complex Data Objects – Generalization of Structured Data Aggregation and Approximation in Spatial and Multimedia Data Generalization of Object Identifiers and Class/Subclass Hierarchies, Generalization of Class Composition Hierarchies, Construction and Mining of Object Cubes, Generalization-Based Mining of Plan Databases by Divide-and-Conquer, Mining Spatial Databases, Spatial Data Cube Construction and Spatial OLAP, Spatial Association Analysis, Spatial Clustering Methods, Spatial Classification and Spatial Trend Analysis, Mining Multimedia Databases, Similarity Search in Multimedia

Data, Multidimensional Analysis of Multimedia Data, Classification and Prediction Analysis of Multimedia Data, Mining Time-Series and Sequence Data, Mining Text Databases, Mining the World Wide Web.

10. Applications and Trends in Data Mining – Data Mining Applications, Data Mining System Products and Research Prototypes, Additional Themes on Data Mining, Social Impacts of Data Mining, Trends in Data Mining.

BOOKS:

1. Data Mining: – Concepts and Techniques by Jiawei Han and Micheline Kamber, -- Morgan Kaufmann Publisher (Elseviers)
2. Data Mining Techniques: - by A.K. Pujari,, Tenth Edition, Universities Press.

5th SEMESTER MCA

SESSIONALS

MCA-391 **ENTERPRISE WEB BASED COMPUUTING WITH JAVA LAB. (0-0-3)Cr.-2**

1. Web page designing using HTML (Table, Forms, Frameset, clickable map, images list etc.)
2. Client side scripting through Java script (simple script, Java script object, Model working with properties and methods, event handling, Form validation etc.)
3. Server side scripting through Perl, Servlet, JSP (Simple Server Side Programming)

5th SEMESTER MCA

SESSIONALS

MCA-392 **NETWORK PROGRAMMING USING SOCKET (C / JAVA) (0-0-6)Cr.-4**

1. Connection oriented socket (TCP)
2. Connection less socket (UDP)
3. Socket system calls

Bind ()_ Send ()

Listen () Send to () Recv () Recvform () Accept () etc.

Examples :

Echo server and client using TCP & UDP
Connect Server client using TCP & UDP
Iterative Server client using TCP & UDP
File transfer client using TCP & UDP