

MCA 401 OPERATIONS RESEARCH

Module I

Linear programming problems - Mathematical formulation, graphical method of solution, simplex method

Module II

Duality in linear programming problems, dual simplex method, sensitivity analysis, transportation and assignment problems, Traveling salesman Problem.

Module III

Game theory Introduction, two-person zero-sum games, some basic terms, the maxmini-minimax principle, games without saddle points-Mixed Strategies, graphic solution of $2 \times n$ and $m \times 2$ games, dominance property.

CPM & PERT- project scheduling, critical path calculations, Crashing.

Module IV

Queueing theory -basic structure of queueing systems, roles of the Poisson and exponential distributions, classification of queues basic results of M/M/1: FIFO systems, extension to multi-server queues.

Module V

Simulation: simulation concepts, simulation of a queueing system using event list,pseudo random numbers, multiplication congruential algorithm, inverse transformation method, basic ideas of Monte-Carlo simulation.

References

- Taha.H.A ,operation Research : An Introduction, McMilan publishing Co., 1982. 7th ed.
- Ravindran A, Philips D.T & Solbery.J.J, Operations Research: Principles and practice, John Wiley & Sons, New York, 1987.
- Frank S. Budnick, Dennis Mcleavey and Richard Mojena, Principles of Operations Research for Management. All India Traveler Book seller, Delhi.
- Gillet.B.E., Introduction to Operations Research - A Computer oriented algorithmic approach, McGraw Hill, 1987.
- Joseph.G.Ecker & Michael Kupper Schimd, Introduction to operations Research, John Wiley & Sons, 1988.
- Hillier.F.S & Liberman.G.J, operation Research, Second Edition, Holden Day Inc, 1974.
- Kanti Swarup, Gupta.P.K. & Man Mohan, operations Research, S.Chand & Sons.

MCA 402 COMPUTER NETWORKS

Module I

Networking Concepts: Simplified network model. Classification of networks: LAN, MAN, WAN and the Internet. Protocols and protocol architecture. The OSI ref. Model, TCP/IP ref. model, its origin, the Internet layer, the TCP layer, the application layer. Comparison of the OSI and TCP/IP ref. models. A critique of the OSI model and protocols, A critique of the TCP/IP ref. model, Novel Network.

Data Link Layer: Need for data link control, Frame synchronization - flag fields, bit stuffing, flow control - stop and wait, sliding window protocol, error detection - parity check, CRC, Error control - Stop and wait ARQ, Go back-N ARQ, HDLC protocol, other data link protocols - LAPB, LAPD.

Module II

Local Area Networks: LAN protocol architecture (IEEE - 802 reference model), Topologies - Bus, tree, ring and star. Logic link control. Medium access control:-Random access- Aloha, CSMA, CSMA/CD, Exponential Back off algorithm, CSMA/CA, controlled access-Reservation, Polling, Token Passing.

LAN systems: Traditional Ethernet:-MAC sub layer access method(CSMA/CD), IEEE 802.3 MAC frame, Addressing physical layer, Physical Layer, Physical Layer Implementation, Bridged Ethernet, Switched Ethernet, Full-Duplex Ethernet. FAST ETHERNET:- Mac Sublayer, Physical Layer, Physical Layer Implementation, GIGABIT ETHERNET:- MAC Sublayer, Physical Layer, Physical Layer Implementation.

LAN Connecting Devices-Repeaters, Hubs, Bridges:- filtering, Transparent Bridges, Spanning Tree Algorithm.Two-Layer Switch.

Backbone Networks- Bus Backbone, Star Backbone, Connecting Remote LANs.

Module III

Wireless LAN Technology:-Overview-Wireless LAN Applications, Wireless LAN Requirements, Wireless LAN Technology. Infrared LANs-Strengths and Weakness, Transmission Techniques. Spread Spectrum LANs- Configuration, Transmission Issues. Narrowband Microwave LANs.

IEEE 802.11 Wireless LAN Standard:- IEEE 802.11 Architecture and Services, Medium Access Control-CSMA/CA, Physical Layer-IEEE-802.11 FHSS, IEEE-802.11 DSSS, IEEE-802.11a OFDM, IEEE-802.11b HR-DSSS, IEEE-802.11g OFDM. IEEE-802.11 Addressing Mechanism.

Blue Tooth:- Architecture, Bluetooth Layers, Radio Layer, Baseband Layer, L2CAP, Other Upper Layers.

VIRTUAL LANS:- VLAN Technology, Membership, Configuration, Communication Between Switches, IEEE Standard, Advantages.

Module IV

Network Layer: Services of NW layer, Routing: Characteristics, performance criteria, routing strategies: fixed routing, flooding, random routing, Adaptive routing, congestion control,

Switched WAN – Virtual Circuit Switching, Global addressing, Virtual circuit identifier, Connection Setup:- Permanent Virtual Circuit, Switched Virtual Circuit, X.25 WAN, X.25 layers and protocols.

Module V

High Speed Switched WANs.

Frame Relay:- Back ground, Architecture, Frame Relay Layers, Frame Relay frame – LAPF core, LAPF control.

ATM :- design goals, Cell Network, Asynchronous TDM, ATM Architecture, Identifiers, ATM Layers:- ATM layer, ATM Headers, ATM Adaptation Layer:- AAL1, AAL2, AAL3/4, AAL5.

Transport Layer: Services, elements of transport protocol, simple transport protocol.

References

- Behrouz A. Forouzan – Data Communications and Networking- Fourth Edition- Tata McGraw Hill
- William Stallings- Data and computer communications- PHI- Seventh Edition.
- Andrew S Tanenbaum- Computer Networks - Fourth Edition- PHI.
- William Stallings – Wireless Communications and Networks- Pearson Education.
- William Stallings- ISDN and BROADBAND ISDN WITH FRAME RELAY AND ATM-Fourth Edition - Pearson Education.
- Gerd Keiser – Local Area Networks- Second Edition - Tata McGraw Hill

MCA 403 LINUX AND SHELL PROGRAMMING

Module I

Introduction to Linux - History, Architecture, Comparison with UNIX, Features and Facilities of Linux, Basic commands in Linux, Files and File Structure - Linux File System, Boot block, Super block, Inode table, Data blocks, Linux standard directories. File naming Conventions, Path, Types of file names and Users, File Commands in Linux, file comparisons, Directory Commands, Text Editors-Functions of a Text Editor, vi Editor, Locating Files, File Access Permissions [FAP], Viewing and Changing FAPs, Redirection, Filters, Pipes.

Module II

Basics of shell programming, various types of shell available in Linux, comparisons between various shells, shell programming in bash - Conditional and looping statements, Iterations, Command Substitution - expr command, arithmetic expansion, parameter passing and arguments, Shell variables, system shell variables, shell keywords, Creating Shell programs for automating system tasks.

Module III

Common administrative tasks, identifying administrative files configuration and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disabling of users accounts, creating and mounting file system.

Module IV

Checking and monitoring system performance - file security & Permissions, becoming super user using su. Getting system information with uname, host name, disk partitions & sizes, users, kernel. Installing and removing packages. Backup, restore and Compress utilities - tar, cpio, dump,rsync and restore utilities,

Module V

Communication in Linux - mesg, who- T, talk, write, wall, finger, chfn, ping, traceroute utilities, email facilities . Configuration of servers- Telnet, FTP, DHCP,NFS, SSH, Proxy Server(Squid), Web server (Apache), Samba. Daemons- init, crond, atd, xinetd, inetd, the services file. named, sshd, httpd.

References

- Operating System - Linux, NUT Press, PHI Publisher, 2006 Edition
- Red Hat Linux Bible, Cristopher Negus, Wiley Dreamtech India
- UNIX Shell Programming by YeswantKanetkar, BPB
- Linux Administration Handbook, EviNemeth,Garth Snyder, Trent KHein - Pearson Education.
- Beginning Linux Programming by Neil Mathew & Richard Stones, Wiley Dreamtech India

MCA 404 OBJECT ORIENTED MODELING AND DESIGN

Module I Introduction and Inception

Object – Oriented Analysis and Design, Iterative Development, Inception , Evolutionary Requirements ,Use Cases and Other Requirements Artifacts

Module II Elaboration - Iteration 1

Iteration 1 Basics, Domain Models , System Sequence Diagrams , Operation Contracts Requirements to design, Logical Architecture and UML Package Diagrams, Object Design , UML Interaction Diagrams ,UML Class Diagrams

Module III Design Patterns and Elaboration - Iteration 1 continued

Objects and Responsibilities - Grasp , Object Design Examples , Visibility and Design , Mapping Designs to Code , Test Driven Development and Refactoring

Module IV Elaboration - Iteration 2 and Patterns continued

Iteration 2 Basics , UML Tools and UML as Blueprint , Quick Analysis Update , GRASP : More Object Design ,GoF Patterns

Module V Elaboration - Iteration 3

Iteration 3 Basics, Activity Diagrams and Modeling , State Machine Diagrams and Modeling , Relating Use Cases , Domain Model Refinement , Architectural Analysis , Logical Architecture Refinement, UML deployment and component diagrams

References

- Larman, Craig, Applying UML and Patterns: An Introduction to Object-Oriented Analysis, Pearson Education, 3rd Ed., 2004.
- Michael Bleha, James Rumbaugh, Object-Oriented Modelling & Design with UML, Pearson, 2nd Ed., 2005.
- Bahrami A., Object Oriented Systems Development using Unified Modeling Language, McGraw Hill, 1999.
- Grady Booch et al., Unified Modeling Language User Guide, Pearson Education, 1999
- Martin Fowler et al., UML Distilled, Pearson Education, 2002
- Bruegge B., Object-Oriented Software Engineering, Pearson, 2000.
- The Unified Modeling Language Reference Manual., Rumbaugh, Jacobson and Booch., Addison-Wesley

MCA 406 Linux Lab

Installation of Linux, network based installation

Basic Overview of various commands- cal, pwd, cd, ls, mv, cp, rm, mkdir, rmdir, more, less, touch. Creating and viewing files using cat, file comparisons, disk related commands, checking disk free spaces. Batch commands, kill, ps, who, Printing commands, find, sort, touch, file, file processing commands- wc, cut, paste etc - mathematical commands - expr, factor etc. Filter commands- pr, head, tail, cut, sort, uniq, tr - Filter using regular expression grep, egrep, sed, awk

Shell Programming -Shells, Scripting Rationale Creating a bash Script, bash Start up Files, A Script's Environment, Exporting Variables, Exit Status, Programming the Shell, Parameter Passing, Operators, looping, Input and Output.

Process Management with Linux, File System management, User Administration, Linux Start up and Shutdown, Software package Management

Network Administration

LAN Card configuration, Server Configuration- DHCP, DNS, FTP, Telnet, SSH, NFS, Web Server, SQUID Proxy server.

References

- Operating System - Linux, NUT Press, PHI Publisher, 2006 Edition
- Red Hat Linux Bible, Cristopher Negus, Wiley Dreamtech India
- UNIX Shell Programming by YeswantKanetkar, BPB
- Linux Administration Handbook, EviNemeth, Garth Snyder, Trent KHein - Pearson Education.
- Beginning Linux Programming by Neil Mathew & Richard Stones, Wiley Dreamtech India

MCA 407(A) Open Source Lab - Python

1. Data Types and Data Structures :

Introduction to Python: - using the Python interpreter, Overview of programming in Python, Python built-in types, Arithmetic in Python, Program input and Program output, Variables and assignment.

Strings and string operations, List basics, List operations, Dictionaries, Dictionary basics and Tuples,

(a) Simple programs using elementary data items, lists, dictionaries and tuples.

2. Control Structures:

Control Statements:-if statements, while statement, for statements, functions, formal arguments, variable-length arguments, Exceptions, detecting and handling exceptions.

(a) Programs using conditional branches, loops.

(b) Programs using functions

(c) Programs using exception handling

3. Classes ,files and modules

Introduction to Classes and Objects:-classes, class attributes, instances, instance attributes, binding and method invocation, inheritance, polymorphism, Built-in functions for classes and instances.

Files and input/output, reading and writing files, methods of file objects, using standard library functions, dates and times

(a) Programs using classes and objects

(b) Programs using inheritance

(c) Programs using polymorphism

(d) Programs to implement file operations.

(e) Programs using modules.

4. Database and web programming

Python database application programmer's interface (DB- API), connection and cursor objects, Type objects and constructors, python database adapters.

Creating simple web clients, introduction to CGI, CGI module, building CGI applications, python web application frameworks: django .

(a) Programs using python database API.

(b) Programs for creating simple web pages.

(c) Programs for creating dynamic and interactive web pages using forms.

5. Development of sample web applications using python.

Sample applications may include

i) Web based polling

ii) Social networking site

iii) Online transaction system

iv) Content management system

References

1. Core Python Programming by Wesley J. Chun, 2nd Edition , Pearson Education
2. An Introduction to Python by Guido Van Russom, Fred L.Drake, Network Theory Limited.
3. Beginning Python: From Novice To Professional By Magnus Lie Hetland, Second Edition Apress
4. Programming in Python 3 by Mark Summerfield, Pearson Education

Websites :

Online version of An Introduction To Python

<http://www.network-theory.co.uk/docs/pytut/>

online python tutorials

<http://docs.python.org/tutorial/>

<http://zetcode.com/tutorials/pythontutorial/>

<http://www.sthurlow.com/python/>

<http://www.tutorialspoint.com/python/>

A site for django resources

<http://www.djangoproject.com/>

Online book on django Framework

<http://www.djangobook.com/>

MCA 407(B) Open Source Lab- PHP

PHP Basics- Syntax, Operators, Variables, Constants, Control Structures, Language Constructs and Functions.

Functions- Syntax, Arguments, Variables, References, Returns, Variable Scope

Arrays- Enumerated Arrays, Associative Arrays, Array Iteration, Multi-Dimensional Arrays, Array Functions, SPL.

Object Oriented Programming- Instantiation, Modifiers/Inheritance, Interfaces, Exceptions, Static Methods & Properties, Autoload, Reflection, Type Hinting, Class Constants.

Strings and Patterns- Quoting, Matching, Extracting, Searching, Replacing, Formatting

Web Features- Sessions, Forms, GET and POST data, Cookies, HTTP Headers

Databases and SQL - SQL, Joins, Analyzing Queries, Prepared Statements, Transactions. **Streams and Network Programming-** Files, Reading, Writing, File System Functions, Streams

Sample web applications using PHP

References

- Professional PHP 6 EdcLecky –Thompson, Steven D. Nowicki,Thomas Myer
Wrox Publishers
- PHP6 and MySQL Bible – Steve Suehring,TimConverse,and Joyce Park
Wiley India Pvt.Ltd

MCA 405(1) VISUAL PROGRAMMING

Module I

Parts of Visual C++ program - application object – main window object, view object document object. Event oriented window programming , device context. Elements of GUI & Visual design, Designing and Creating a Visual C++ Program, Project work spaces, Debug and Release Targets, Cleaning up.

Exception handling and Debugging .

Module II

Basics of MFC & MFC-based executables. Event Handling : Reading keystrokes, handling mouse , creating menus, tool bars, buttons, status bar prompts, dialog box, check box, radio buttons, list boxes, combo boxes, sliders, serialization , file handling, multiple documents.

Module III

Understanding Message maps and message loops, Events and Event handling, Mouse events, Keyboard events, Dynamic data Exchange and verification, creating Menus, Modeless dialog boxes. Device contexts, working with images, bitmaps and icons, creating bitmap buttons, creating and using Pens, Brushes, and Fonts.

Module IV

Document - View Architecture basics, the document class and view class, creating SDI applications, Multitasking, creating MDI Applications, Working with menu in documents, Toolbar and status bar.

Module V

Multi threaded Programming- Worker threads , user interface threads, thread synchronization. Basics of COM- ActiveX Technology, The component Object Model, Real COM with

MFC Library, Containment and Aggregation vs. Inheritance

References

- Yeshwant Kanetkar , Visual C++ Programming , BPB
- David Kruglinski, George Shepherd & Scot Wingo, Programming Visual C++, Microsoft Press
- Indian Reprint, 2000
- Holzner Steven, “Visual C++ 6 in record time”, BPB publications
- Jeff Prosise, Programming Windows with MFC, Microsoft Press, 2000
- Charles Petzold, “Programming Windows”, 5th Edition, Microsoft Press, 1999.
- Mickey Williams , David Bennett, Visual C++ 6 Unleashed (Hardcover) , SAMS
- Yeshwant Kanetkar, Visual C++ Projects.
- David Kruglinski, George Shepherd & Scot Wingo, Programming Visual C++, Microsoft Press
- Indian Reprint, 2000
- Chuck Sphar, Learn Visual C++ Now, Microsoft Press/Phi, 1999
- Ivor Horton, Programming Visual C++ Standard Edition, Wrox Press, 1999
- Herbert Schildt, MFC Programming for the GROUND UP, Second Edition, Tata McgrawHill, 2000
- Richard.C.Leinecker and Tom Archer, Visual C++ Programming Bible, Wiley Dream Tech, 2005

MCA 405(2) SOFTWARE QUALITY MANAGEMENT

Module I Quality Concepts

Basic Quality Concepts, Companywide Assessment of Quality, Quality Improvement and Cost Reduction, Quality Control

Module II Basic Quality Management concepts

Process Management, Organization for Quality, Strategic Quality Management, Developing a Quality Culture, Understanding Customer Needs

Module III Software Quality Management

Software Quality in Business Context, Managing Software Quality in an Organization, Planning for Software Quality Assurance, Product Quality and Process Quality

Module IV Metrics and Audits

Software Measurement and Metrics, Walkthroughs and Inspections, Software Configuration Management, Quality Assurance Audits

Module V Techniques for Quality Improvement

ISO 9001, Software CMM and Other Process Improvement Models, Software Testing, Quality Related Additional topics - SQC and SPC, Software Maintenance Models, Maintainability in OO and e-Business Era

References

- Frank Gryna, Richard Chua, Joseph Defeo, "Juran's Quality Planning and Analysis for Enterprise Quality", Fifth Edition, Tata McGraw Hill
- Nina S Godbole, "Software Quality Assurance", 2004, Narosa
- Stephen H.Kan, "Metrics and Models in Software Quality Engineering", Second Edition, Pearson, 2003.
- Jeff Tian, "Software Quality Engineering", 2005, Wiley Student Edition
- Pankaj Jalote, "Software Project Management in Practice", 2002, Pearson
- Roger S. Pressman, "Software Engineering - A Practitioner's Approach", Seventh Edition, McGraw Hill, 2010.
- Humphrey Watts, "Managing the Software Process", Addison Wesley, 1986.

MCA 405(3) BUSINESS DATA PROCESSING AND COBOL PROGRAMMING

Module I

INTRODUCTION

Business Data Processing, Types of COBOL, Mainframe COBOL, Transaction Files, Master Files, File Processing, Coding Format for Cobol Program, Structure of a Cobol Program, Character set, Cobol words, Data names and identifiers, Literal, Figurative Constants, Continuation of lines and notations. IDENTIFICATION , ENVIRONMENT DIVISION AND DATA DIVISION :General formats, Configuration section, Input-output section, Level Structure, Data description entries, Picture clause, Value clause, File section, Working - Storage Section, Editing characters of different data and examples, special-names paragraph, Classes and categories of data.

Module II

PROCEDURE DIVISION, VERBS AND CLAUSES

Structure of procedure division, Data movement verb and other options of move statements, Arithmetic verbs, Sequence control verbs, Input & Output verbs, conditional verb : simple IF, Categories of COBOL statements. Usage Clause, Synchronized clause, Justified clause, Redefines clause and Renames clause, qualification of data names, sign clause, Elementary and Group moves, corresponding option : Move Corresponding, Add Corresponding & Subtract Corresponding, Rounded option, On size error option, compute verb.

Module III

COMPUTATION AND DECISION MAKING

Interactive processing using screen sections, Intrinsic Functions, Conditions: Relational, class, Condition-name, compound, sign, IF statements, Alter statements, Perform statements, Exit statements.

Module IV

ARRAY PROCESSING AND TABLE HANDLING

Occurs clause, subscripting, Assigning values to table elements, Multidimensional tables, Perform & table handling, Indexed tables & Indexing. Set verb, search verb, Occurs depending clause, Index data item.

Module V

SEQUENTIAL,INDEXED & RELATIVE FILE PROCESSING, REPORT WRITER AND SUBROUTINES

File characteristics, file control entries, file description. Statements for sequential files, Sequential file with variable length records, I/O control paragraph, Simple sort verb, file updation, variation of updation, Simple merge verb, input and output procedure in sort statements, Merge verb with output procedure. File control paragraph, for relative files, Procedure division statements for relative files, Indexed sequential files, General format of a report, File section, Report clause, Outline of a report section, Report section - report description entry, report group, procedure division statements, Sample program, Structure of COBOL subroutine, Calling of a Subroutine, State of subroutine and cancel statement, Advantages and Disadvantages of cobol subroutines.

References

- M.K Roy and d Ghosh Dastigar, COBOL Programming, including MS COBOL and COBOL 85, Tata McGraw Hill 1997
- 2.Nancy Stern and Robert a Stern, Structered COBOL Programming, 8th Edition, john Wiley 1997
- 3. Structured Cobol Programming , Shelly Cashman , Thomson aLearning 2Edn.

MCA 405(4) ENTERPRISE RESOURCE PLANNING

Module I

ERP Overview - Definition, History, Benefits, Enterprise Applications. ERP Life Cycle, Implementation Methodology. Costs of ERP Implementation. Selecting Consulting Partner. ERP package Selection, Project Team and Organizational Structure.

Module II

ERP Project Management, Requirements, Business Process Re-engineering - re-engineering phases, role of IT in BPR, benchmarking, Business Process Modeling and Business Modeling, Gaps, Gap management Strategy, Configuration and Testing

Module III

ERP Security, Data Migration, Cut-over Planning and Go Live Preparation, Training, Change management, ASAP Methodology, Success/failure of an ERP implementation, Application Support-Support Cycle, Transition Cycle, Service levels and SLAs, Support Models.

Module IV

ERP functional Modules- Human capital management, financial Management, Procurement and Inventory Management, Supplier Relationship Management, supply Chain Planning, Sales and Service, CRM, Quality Management, Product Life Cycle management, Logistics.

Module V

Technology for ERP- Portal, Content Management System, Business Intelligence, Data warehousing. Emerging trends in ERP.

Case Studies-ITC, Nestle, Maruti Suzuki, Airtel, Asian Paints.

References

- Enterprise Resource Planning, Rajesh Ray, 1st Edition, McGraw Hill Publications
- Enterprise Resource Planning, Alexis Leon, Tata McGraw Hill Publications
- Enterprise Resource Planning, Jagan Nathan Vaman, Tata McGraw Hill Publications
- Enterprise Resource Planning, Sumner, Pearson Publications

MCA 405(5) MULTIMEDIA SYSTEMS

Module I

Media and data streams – Medium, Properties of a multimedia system, Traditional data streams, Continuous data stream, Information Units. Sound concepts, Music – MIDI, MIDI Devices, MIDI and SMPTE timing standards, MIDI software. Speech – Generation, Analysis, Transmission.

Module II

Images and Graphics – Concepts, Image processing. Video and Animation – Concepts, television , Computer based animation. Data compression – Coding, JPEG-Image preparation, Lossy DCT based Mode, Hierarchical mode, H.261- Image Preparation, Coding Algorithms, Data Stream, MPEG-Video/Audio Encoding, Data stream, MPEG-2, MPEG-4, DVI.

Module III

Multimedia OS – Realtime, Resource Management, Process Management, File Systems, OS Issues, System Architecture. Multimedia Communication Systems – application Subsystem, Transport Subsystem, QoS and Resource Management.

Module IV

Multimedia DBMS- Characteristics, Data Structure, Operations, Database Model. Hypertext and Hypermedia, SGML, ODA, MHEG.

Module V

Synchronization – Notion of synchronization, Presentation requirements, Reference model for synchronization, Synchronization Specifications, Synchronization Case Studies – MHEG, HyTime, MODE, ACME.

References:

- Multimedia: Computing, Communications and Applications, Steinmetz & Nahrstedt, Pearson Education
- Multimedia communications, Fred Halsall, Pearson Education
- Multimedia Systems, Koegel Buford, Pearson Education

MCA 405(6) NEURAL NETWORKS AND FUZZY LOGIC

Module I

Neural Networks:- Basic Concepts of Neural Networks, Characteristics - Human Brain – Artificial Neural Network – Terminologies, Model of an Artificial Neuron –Architectures – Learning Methods, Some Application Domains .

Module II

Functional Units for Pattern Recognition :- Pattern recognition problem, Basic functional units, Pattern recognition tasks by functional units.

Module III

Feedforward Neural Networks:-Analysis of pattern classification networks: Pattern Classification problem, Perceptron- Learning Law, Convergence Theorem, Representation problem.

Linear inseparability : - Hard problems, Geometrical Interpretation of Hard problems: Multilayer perceptrons. Back propagation- Learning: Features, Performance, Limitations.

Module IV

Fuzzy Logic:- Fuzzy Versus Crisp – Crisp sets – Operations on Crisp Sets, Properties of Crisp Sets , Fuzzy Sets, Basic Fuzzy Set Operations, Properties of Fuzzy Sets – Crisp Relations, Operations on Crisp Relations - Fuzzy Relations – Operations on Fuzzy Relations , Properties, Membership Functions, Fuzzification, Defuzzification Methods.

Module V

Fuzzy Systems:- Fuzzy Rule Base- Fuzzy Reasoning, Fuzzy Inference systems , Fuzzy Logic Control Systems, Applications.

References

- Yegnanarayana B , Artificial Neural Networks, Prentice-Hall of India Pvt.Ltd
- Haykin S, *Neural Networks – A Comprehensive Foundation*, Second Edition, Pearson Education Asia, 1999.
- S. N. Sivanandan and S. N. Deepa , Principles of Soft Computing , Wiley India 2nd Ed, 2011.
- John Yen, Reza Langari , Fuzzy Logic –Intelligence, Control and Information, Pearson Education,2005.
- Anderson J A, *An Introduction to Neural Networks*, Prentice-Hall of India, 1995.

- S. Rajasekaran and G.A Vijayalakshmi Pai, *Neural Networks, Fuzzy Logic, and Genetic Algorithms Synthesis and Applications*, Prentice-Hall of India Pvt.Ltd ,2004.
- Bose N K, *Neural Network Fundamentals with Graphs, algorithms, and Applications*, Tata McGraw-Hill, 2001.

MCA 405(7) ARTIFICIAL INTELLIGENCE

Module I

Introduction to Artificial Intelligence – Architecture of Artificial Intelligence Systems- problem solving : Problems and problem spaces. Problem Definition – production systems – control strategies – search strategies, problem characteristics – production system characteristics.

Module II

Knowledge Representation Schemes:- Proposition and predicate logic – Syntax and semantics- Properties of WFFS – Conversion to clausal form – Inference rules – Resolution – Non Deductive Inference Methods – Representation using Rules. Associative Network, Frames and Object Oriented Repn. of knowledge. Associative Networks – Frame Structure, conceptual dependencies and scripts.

Module III

Search and control strategies – examples of search problem – Uniformed or Blind search problem – Informed search – searching And OR graphs. Matching Techniques – Structures used for Matching – Measures for Matching, knowledge organization and management – indexing and retrieval techniques.

Module IV

General concepts in knowledge Acquisition – Types of learning, Difficulty in knowledge Acquisition, General Learning model. Early work in Machine Learning – Analogical and Explanation based learning – Analogical Reasoning and Learning – Examples, Explanation based learning. Expert System Architectures – Rule based system, Non production system, Dealing with uncertainty.

Module V

Natural language Processing – Overview of Linguistics, Grammers and Languages, Basic Parsing Techniques, Semantic analysis and Repn structures Natural language system. Pattern Recognition – Recognition and classification process – classification patterns recognizing and understanding speech. Perception – solving perceptual problem.

References

- Introduction to A.I and Expert system – D.W. Patterson, Prentice Hall of India.

- Artificial Intelligence – Elaine Rich, Mc Graw Hill.
- Principles of Artificial Intelligence – Nilson N. J, Springer Verlag.
- Introduction to Artificial Intelligence – Charvanak. E and Mc dermoit D, Addison Wesley

MCA 405(8) MANAGEMENT INFORMATION SYSTEMS

Module I

Digital Firm- Concepts, Definition, Role, Control System, Management Support, Management Effectiveness, Digital Firm. E-Business and E-Commerce, System Concepts, Feedback and Control, Corporate Planning, Types of strategies, Business Planning, Balance Score Card, Strategic Business Planning. Security Challenges- threats and vulnerabilities, controlling threats, disaster management, information security.

Module II

DSS, Decision Analysis, Organizational Decision Making, concepts on information, Information Classification, Knowledge and Knowledge management. Business Intelligence, Expert Systems. System Analysis, General Model of MIS, Need and role of System Analysis, System development Model, OOA, SSAD, OOSAD Development Life Cycle. Development process of MIS, Process Model.

Module III

Business Process Re-engineering, Value Stream Model, MIS and BPR. DSS, GDSS, Knowledge Management Systems, DSS in E-enterprises, Enterprise Management System, ERP, SCM, CRM, EMS and MIS.

Module IV

Technology of IS – Data Processing, Transaction Processing, OLAP, TQM, Networks – Topology, Data Communication, Unified Communications, Components of UC, WiMAX. Database- Database Models, Database Design, RDBMS, Client-Server Architecture and implementation strategies. Data Warehouse, Architecture of Data Warehouse, Implementation.

Module V

E-Business, Internet and WWW, E-Commerce, categories of E-Commerce, Electronic payment Systems, Content Management Systems, Enterprise Portal, Security in e-business, privacy issues, Tools for security management, Systems Control and Audit, Global MIS – Outsourcing and Off shoring, Global Business strategies.

References

- Management Information Systems, Waman S Jawadekar, 4th Edition, McGraw Hill
- Management Information Systems, O'Brien, Marakas and Behl, 9th Edition, Tata Mcgraw Hill Publication.
- Management Information System, Laudon, Laudon & Dass, 11th Edition, Pearson Education
- Management Information System, Davis & Olson, Tata McgrawHill Publication.
- Information system for Modern management, Murdick, Rose & Cloggett, PHI Publications.