### M.C.A. (MASTER OF COMPUTER APPLICATIONS)
#### II TO VI SEMESTERS (FULL TIME) CURRICULUM AND SYLLABUS

#### SEMESTER II

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Total No of Credits to be earned for the Award of Degree 23+21+22+19+12 = 97
# LIST OF ELECTIVES FOR M.C.A.

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MA9221 MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE    LT P C
                                           3 1 0 4

UNIT I  MATRIX ALGEBRA          12
Matrices, Rank of Matrix, Solving System of Equations-Eigen Values and Eigen Vectors-
Inverse of a Matrix - Cayley Hamilton Theorem

UNIT II  BASIC SET THEORY            12
Basic Definitions - Venn Diagrams and set operations - Laws of set theory - Principle of
inclusion and exclusion - partitions- Permutation and Combination - Relations-
Properties of relations - Matrices of relations - Closure operations on relations -
Functions - injective, surjective and bijective functions.

UNIT III  MATHEMATICAL LOGIC               12
Propositions and logical operators - Truth table - Propositions generated by a set,
Equivalence and implication - Basic laws- Some more connectives- Functionally
complete set of connectives- Normal forms - Proofs in Propositional calculus - Predicate
calculus.

UNIT IV  FORMAL LANGUAGES              12
Languages and Grammars-Phrase Structure Grammar-Classification of Grammars-
Pumping Lemma For Regular Languages-Context Free Languages.

UNIT V  FINITE STATE AUTOMATA            12
Finite State Automata-Deterministic Finite State Automata(DFA), Non Deterministic
Finite State Automata (NFA)-Equivalence of DFA and NFA-Equivalence of NFA and
Regular Languages.

TOTAL : 60 PERIODS

REFERENCES:
  Fourth Edition, 2002 (Unit 1,2 & 3).
2. Hopcroft and Ullman, “Introduction to Automata Theory, Languages and
  Computation”, Narosa Publishing House, Delhi, 2002. ( Unit 4,5)

MC9222 OBJECT ORIENTED PROGRAMMING    LT P C
                                           3 0 0 3

UNIT I    FUNDAMENTALS                9
Program Structure – Enumeration Types — Functions and Pointers – Function
Invocation – Overloading Functions – Scope and Storage Class – Pointer Types –
**UNIT II IMPLEMENTING ADTS AND ENCAPSULATION**

Aggregate Type struct – Structure Pointer Operators – Unions – Bit Fields – Data Handling and Member Functions – Classes – Constructors and Destructors – Static Member – this Pointer – reference semantics – implementation of simple ADTs.

**UNIT III POLYMORPHISM**


**UNIT IV TEMPLATES**


**UNIT V INHERITANCE**


**TOTAL: 45 PERIODS**

**REFERENCES:**

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**MC9223 DESIGN AND ANALYSIS OF ALGORITHMS**

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UNIT IV  BACKTRACKING AND BRANCH AND BOUND  14

UNIT V  NP-HARD AND NP-COMPLETE PROBLEMS  12

REFERENCES:
UNIT V OTHER SYSTEM SOFTWARE

TOTAL : 45 PERIODS

TEXT BOOK:

REFERENCES:

MC9225 OPERATING SYSTEMS

UNIT I INTRODUCTION
Introduction – Operating Systems and services – Processes – CPU Scheduling approaches
9

UNIT II PROCESS SYNCHRONIZATION
Process synchronization – Semaphores – Deadlocks – Handling deadlocks – Multithreading
9

UNIT III MEMORY MANAGEMENT
Memory management – Paging – Segmentation – Virtual Memory – Demand paging – Replacement Algorithms
9

UNIT IV DISK SCHEDULING
Disk Scheduling approaches – File systems – Design issues – User interfaces to file systems – I/O device management.
9

UNIT V CASE STUDIES
9

TOTAL : 45 PERIODS

REFERENCES:
MC9226  OBJECT ORIENTED PROGRAMMING LAB  L T P C
0 0 3 2
1. Write a C++ Program to illustrate Enumeration and Function Overloading
2. Write a C++ Program to illustrate Scope and Storage class
3. Implementation of ADT such as Stack and Queues
4. Write a C++ Program to illustrate the use of Constructors and Destructors and Constructor Overloading
5. Write a Program to illustrate Static member and methods
6. Write a Program to illustrate Bit fields
7. Write a Program to overload as binary operator, friend and member function
8. Write a Program to overload unary operator in Postfix and Prefix form as member and friend function
9. Write a Program to illustrate Iterators and Containers
10. Write a C++ Program to illustrate function templates
11. Write a C++ Program to illustrate template class
12. Write C++ Programs and incorporating various forms of Inheritance
13. Write a C++ Program to illustrate Virtual functions
14. Exception Handling

TOTAL : 45 PERIODS

MC9227  SYSTEM SOFTWARE LAB  L T P C
0 0 3 2
1. Assemblers.
2. Linkers.
3. Loaders.
4. Features of text editors.
5. Basic UNIX commands.
7. Grep, sed, awk.
8. File system related system calls.
10. Message queues.
11. Pipe, FIFO’s.
12. Signals.
13. Shared memory.

TOTAL : 45 PERIODS
MC9228  ALGORITHMS LAB  LT P C  0 0 3 2

1. Quick Sort
2. Binary Search
3. Binary Tree Traversal
4. Warshall's Algorithm
5. Dijkstra's Algorithm
6. Prim's Algorithm
8. Subset Sum Problem – Backtracking
9. Travelling salesperson problem – Branch and Bound
10. Strassen's matrix multiplication

TOTAL : 45 PERIODS

MC9231  COMPUTER NETWORKS  LT P C  3 0 0 3

UNIT I  INTRODUCTION  9

UNIT II  NETWORK FUNDAMENTALS  9

UNIT III  NETWORK LAYER  9

UNIT IV  TRANSPORT LAYER  9

UNIT V  APPLICATIONS  9

TOTAL : 45 PERIODS

REFERENCES:
UNIT I THE 8086 PROCESSOR - SOFTWARE ASPECTS 11
Evolution of Microprocessors - 8086 architecture – Addressing modes– Assembly language programming – Interrupts and interrupt service routines.

UNIT II 8086 SYSTEM DESIGN 10
8086 signals description – Basic configurations - System bus timing –System design using 8086 – Minimum mode /Maximum modes 8086 system and timings.

UNIT III INTERFACING CONCEPTS 10
Memory Interfacing and I/O interfacing - Parallel communication interface – Serial communication interface – Timer – Keyboard /display controller – Interrupt controller – DMA controller – Programming and applications.

UNIT IV ADVANCED PROCESSORS 7

UNIT V BUILDING SYSTEMS 7

TOTAL : 45 PERIODS

REFERENCES:
5. Websites of latest processors.
UNIT I  INTRODUCTION

UNIT II  SOFTWARE DESIGN

UNIT III  SOFTWARE METRICS

UNIT IV  SOFTWARE TESTING AND MAINTENANCE

UNIT V  SOFTWARE CONFIGURATION MANAGEMENT (SCM) & CASE TOOLS

TOTAL : 45 PERIODS

REFERENCES:

UNIT I  BASIC CONCEPTS

UNIT II  3D GRAPHICS
UNIT III VISUAL COMMUNICATION

UNIT IV PRESENTATION

UNIT V INTERACTIVE 3D ILLUSTRATED WITH IMAGES AND TEXT
Generating Illustrated Documents – Consistency of Rendered Images and their Textual Labels – Architecture – Zoom Techniques for Illustration Purpose – Interactive handling of Images and Text – Figure Captions for Anatomical Illustrations.

TOTAL: 45 PERIODS

REFERENCES:

MC9235 WEB PROGRAMMING

UNIT I BASIC INTERNET CONCEPTS
Connecting to the Internet – Domain Name System - Exchanging E-mail – Sending and Receiving Files - Fighting Spam, Sorting Mail and avoiding e-mail viruses – Chatting and Conferencing on the Internet – Online Chatting - Messaging – Usenet Newsgroup – Internet Relay chat (IRC) – Instant Messaging - Voice and Video Conferencing.

UNIT II WORLD WIDE WEB

UNIT III JAVA FUNDAMENTALS

UNIT IV PACKAGES
UNIT V  ADVANCED JAVA PROGRAMMING


TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:

MC9236   GRAPHICS LAB

1. TWO DIMENSIONAL TRANSFORMATIONS:
Creation of two dimensional objects and applying simple transformations like Translation, Scaling, Rotation and applying Composite transformations.

2. THREE DIMENSIONAL TRANSFORMATIONS:
Creation of simple three dimensional objects like cube, cone and cylinder and applying simple transformations like Translation, Scaling, Rotation and applying Composite transformations.

3. VISIBLE SURFACE DETECTION:
Finding out visible surfaces and removal of hidden surfaces in simple objects using object space and image space algorithms.

4. IMAGE EDITING:
Image enhancement, Image transformation from color to gray scale and vice versa, Image manipulation and Image optimization for web - Usage of editing tools, layers, filters, special effects and color modes. Creation of simple Gif animated images with textual illustrations.

TOTAL : 45 PERIODS

MC9237   MICROPROCESSOR LAB

1. Study of BIOS and DOS function calls for keyboard & Display interfacing

2. Assembly Language Programming with 8086 to perform the following operation
   a. Arithmetic & Logical Operation
   b. String Manipulation Operation
   c. File Manipulation Operation
d. Terminate and Stay Resident (TSR) Program

3. Using Assembly Language with C/C++

4. Perform the following interfacing concepts with a microprocessor chip
   a. Traffic signal controller using 8255 PPI
   b. Stepper Motor controller using 8255 PPI
   c. ADC/DAC interface
   d. Waveform generation using 8253/8254 Timers
   e. DC Motor Speed Controller
   f. Keyboard/Display Controller using 8279

TOTAL : 45 PERIODS

REFERENCES:
1. IBM PC Assembly Language and Programming by Peter Abel, fifth edition

MC9238 WEB PROGRAMMING LAB L T P C
0 0 3 2

1. Studying internet connection procedures
2. Sending and receiving mails from one or more email clients
3. Video Conference demonstration
4. Downloading and installing softwares (Example: Java) and setting up path and class path
5. Using FTP
6. Creation of web site with forms, frames, links, tables etc with any web page editors and using images and audio files as part of web pages
7. Writing Java programs by making use of class, interface, package, etc for the following
   (a) Different types of inheritance study
   (b) Uses of 'this' keyword
   (c) Polymorphism
   (d) Creation of user specific packages
   (e) Creation of jar files and using them
   (f) User specific exception handling
8. Writing window based GUI applications using frames and applets such as Calculator application, Fahrenheit to Centigrade conversion etc
9. Application of threads examples
10. Reading and writing text files
11. Reading image files and manipulating them with image related classes and methods
12. Writing an RMI application to access a remote method
13. Writing a Servlet program with database connectivity for a web based application such as students result status checking, PNR number enquiry etc
14. Creation and usage of Java bean

TOTAL : 45 PERIODS
MC9241 NETWORK PROGRAMMING

UNIT I INTRODUCTION

UNIT II ELEMENTARY TCP SOCKETS

UNIT III APPLICATION DEVELOPMENT

UNIT IV SOCKET OPTIONS, ELEMENTARY UDP SOCKETS

UNIT V ADVANCED SOCKETS

TOTAL : 45 PERIODS

REFERENCES:
UNIT II TRANSPORTATION AND ASSIGNMENT MODELS 9
Mathematical formulation of transportation problem - Methods for finding initial basic feasible solution - optimum solution - degeneracy - Mathematical formulation of assignment models - Hungarian Algorithm - Variants of the Assignment problem

UNIT III INTEGER PROGRAMMING MODELS 9
Formulation - Gomory's IPP method - Gomory's mixed integer method - Branch and bound technique.

UNIT IV SCHEDULING BY PERT AND CPM 9
Network Construction - Critical Path Method - Project Evaluation and Review Technique - Resource Analysis in Network Scheduling

UNIT V QUEUEING MODELS 9
Characteristics of Queuing Models - Poisson Queues - (M / M / 1) : (FIFO / ∞ / ∞), (M / M / 1) : (FIFO / N / ∞), (M / M / C) : (FIFO / ∞ / ∞), (M / M / C) : (FIFO / N / ∞) models.

TOTAL : 45 PERIODS

TEXT BOOK:

REFERENCES:

MC9243 VISUAL PROGRAMMING LT P C
3 0 0 3

UNIT I WINDOWS PROGRAMMING 8
The windows programming Model - Event driven programming - GUI concepts - Overview of Windows programming - Creating and displaying the window - Message Loop - windows procedure - WM_PAINT message - WM_DESTROY message - Data types - Resources - An Introduction to GDI - Device context - Text output - Scroll Bars - Keyboard - Mouse - Menus.

UNIT II VISUAL BASIC PROGRAMMING 10
Visual Basic Applications - Form and properties - Variables and Constants - Variant type - Procedure scope - Main - Control statements - control arrays - Creating and using Controls - Menus and Dialogs - Programming fundamentals - Objects and instances - Debugging - Responding to mouse events - Drag and Drag drop events - Responding to keyboard events - keypress, keyup, keydown events - Using grid control - Graphics controls - shape and line control - File system controls - Common dialog controls - Processing files - Accessing databases with the data controls.

UNIT III VISUAL C++ PROGRAMMING 9
Visual C++ components - Introduction to Microsoft Foundation Classes Library - Getting started with AppWizard - Class Wizard - Event handling - Keyboard and Mouse events - WM_SIZE, WM_CHAR messages - Graphics Device Interface - Pen, Brush, Colors, Fonts - Single and Multiple document interface - Reading and Writing documents - Resources - Bitmaps creation, usage of BMP and displaying a file existing as a BMP.
UNIT IV  CONTROLS  9

UNIT V  ADVANCED CONCEPTS  9

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:

MC9244  OBJECT ORIENTED ANALYSIS AND DESIGN  L T P C
3 1 0 4

UNIT I  INTRODUCTION  12

UNIT II  METHODOLOGY AND UML  12

UNIT III  OBJECT ORIENTED ANALYSIS  12
Identifying Usecase – Business object analysis – Usecase driven object oriented analysis – Usecase model – Documentation – Classification – Identifying object, relationships, attributes, methods – Super-sub class – A part of relationships Identifying attributes and methods – Object responsibility
UNIT IV  OBJECT ORIENTED DESIGN  12
Design process – Axions – Colollaries – Designing classes – Class visibility – Refining attributes – Methods and protocols – Object storage and object interoperability – Databases – Object relational systems – Designing interface objects – Macro and Micro level processes – The purpose of a view layer interface

UNIT V  SOFTWARE QUALITY  12

L : 45 T : 15 TOTAL : 60 PERIODS

TEXT BOOK:

REFERENCES:

MC9245 VISUAL PROGRAMMING LAB  L T P C
VB
1. Form Design – Keyboard & Mouse events
2. Programs on usage of data types - variant, Control arrays
3. Simple applications using file system controls
4. Database applications using data control.

VC++
1. SDK type programs for creating simple windows with different window styles
2. SDK type programs code for keyboard and mouse events, GDI objects.
3. Simple Dialog Based application – eg. Calculator, interest computation, money conversions, etc.
5. Programming for reading and writing into documents.
7. Creating static and dynamic splitter windows
8. Creating DLLs and using them.
9. Winsock and WinInet & Internet Explorer common controls.
10. Data access through ODBC – Cdatabase, Crecordset.
11. Creating ActiveX control and using it.

TOTAL : 45 PERIODS
MC9246  NETWORK PROGRAMMING LAB  L T P C
0 0 3 2

1. Socket Programming  
   a. TCP Sockets  
   b. UDP Sockets  
   c. Applications using Sockets
2. Simulation of Sliding Window Protocol
3. Simulation of Routing Protocols
4. RPC
5. Development of applications such as DNS/ HTTP/ Email/ Multi-user Chat

TOTAL : 45 PERIODS

MC9247  CASE TOOLS LAB  L T P C
0 0 3 2

1. Practicing the different types of case tools such as (Rational Rose & other Open Source) used for all the phases of Software development life cycle.
2. Data modeling
3. Semantic data modeling
4. Source code generators
5. Re-engineering
6. Experimenting CASE Environments  
   a. Toolkits  
   b. Language-centered  
   c. Integrated  
   d. Fourth generation  
   e. Process-centered
7. Implementation of the following using CASE Workbenches:  
   a. Business planning and modeling  
   b. Analysis and design  
   c. User-interface development  
   d. Programming  
   e. Verification and validation  
   f. Maintenance and reverse engineering  
   g. Configuration management  
   h. Project management

TOTAL : 45 PERIODS
UNIT I INTRODUCTION
Emergence of Middleware – Objects, Web Services – Middleware Elements – Vendor
Architecture – Interoperability – Middleware in Distributed Applications – Types of
Middleware – Transaction-Oriented Middleware – MOM – RPC.

UNIT II OBJECT ORIENTED MIDDLEWARE
OOM – Developing with OOM – Heterogeneity – Dynamic Object Request – Java RMI –
COM+.

UNIT III COMPONENT OBJECT RESOURCE BROKER ARCHITECTURE (CORBA)

UNIT IV WEB SERVICES
Introduction – XML Web Services standards – Creating Web Services – Extending Web

UNIT V OTHER TYPES OF MIDDLEWARE
Real-time Middleware – RT CORBA – Multimedia Middleware – Reflective Middleware
– Agent-Based Middleware – RFID Middleware.

TOTAL : 45 PERIODS

TEXT BOOKS
1. Chris Britton and Peter Eye, “IT Architecture and Middleware”, Pearson Education,

REFERENCES
1. Qusay H. Mahmoud, “Middleware for Communications”, John Wiley and Sons,
2004.
2. Gerald Brose, Andreas Vogel, Keith Duddy, “JavaTM Programming with CORBATM:
Advanced Techniques for Building Distributed Applications”, Wiley, 3rd edition,
3. Michah Lerner, “Middleware Networks: Concept, Design and Deployment of Internet
MC9252 SOFTWARE PROJECT MANAGEMENT L T P C 3 0 0 3

UNIT I INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT
Project Definition – Contract Management – Activities Covered By Software Project Management – Overview Of Project Planning – Stepwise Project Planning.

UNIT II PROJECT EVALUATION

UNIT III ACTIVITY PLANNING

UNIT IV MONITORING AND CONTROL

UNIT V MANAGING PEOPLE AND ORGANIZING TEAMS

REFERENCES:

TOTAL : 45 PERIODS

MC9253 MIDDLEWARE TECHNOLOGY LAB L T P C 0 0 3 2

Apply the following to typical application problems:
1. Java rmi
2. CORBA
3. COM
4. C# and .NET

A possible set of applications may be the following:
1. Typical experiment to investigate client-server communication
2. Typical experiment to investigate the workings of RMI
3. Typical experiment to investigate the use of CORBA technology with Java.
4. Chat Room
5. Designing of e-business
6. Online games

TOTAL : 45 PERIODS

MC9254 SOFTWARE DEVELOPMENT LAB LT P C
0 0 3 2

Apply the following to typical application problems:

1. Project Planning
2. Software Requirement Analysis
3. Software Estimation
4. Software Design
5. Data Modelling & Implementation
6. Software Testing
7. Software Debugging

A possible set of applications may be the following:

   a. Library System
   b. Student Marks Analyzing System
   c. Text Editor.
   d. Create a dictionary.
   e. Telephone dictionary.
   f. Simulator Software for Parallel Processing Operation.
   g. Inventory System.

TOTAL : 45 PERIODS

MA9227 NUMERICAL AND STATISTICAL METHODS LT P C
3 1 0 4

UNIT I LINEAR SYSTEM OF EQUATIONS 12
Solution of Systems of equations – Solution of Simultaneous linear equations – Gauss elimination methods – Gauss Jordan methods, Jacobi and Gauss Seidal iterative methods

UNIT II NUMERICAL DIFFERENTIATION AND INTEGRATION 12
Interpolation, Differentiation and integration – difference table – Newton’s forward and backward interpolation –Lagrangian interpolation – Differentiation formulae– Trapezoidal and Simpson rule Gaussian – Quadrature

UNIT III DIFFERENTIAL EQUATIONS 12
UNIT IV PROBABILITY DISTRIBUTIONS 12
Probability axioms - Bayes Theorem - Discrete random variables and Continuous random variables - Density & Distribution functions - Joint and marginal distributions - Conditional distributions - Characteristic function - moment generating function - expectation.

UNIT V SAMPLING DISTRIBUTIONS 12
Small sample, t-test, F-test, $\chi^2$-test, ANOVA one way classification and two way classification

TOTAL : 60 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT V  ONLINE COMMERCE ENVIRONMENTS


TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:

MC9272  INFORMATION SYSTEMS  LT P C
3 0 0 3

UNIT I  INFORMATION SYSTEM AND ORGANIZATION
9

UNIT II  REPRESENTATION AND ANALYSIS OF SYSTEM STRUCTURE 9

UNIT III  SYSTEMS, INFORMATION AND DECISION THEORY 9

UNIT IV  INFORMATION SYSTEM APPLICATION 9

UNIT V  DEVELOPMENT AND MAINTENANCE OF INFORMATION SYSTEMS 9

TOTAL : 45 PERIODS
TEXT BOOKS:

REFERENCES:

MC9273 WEB GRAPHICS

UNIT I INTRODUCTION
HTML coding - Basic web graphics - Web page design and site building - Image maps - Adding multimedia to the web- Vector and Raster graphics.

UNIT II RASTER IMAGE EDITING SOFTWARE

UNIT III VECTOR IMAGE HANDLING

UNIT IV MULTIMEDIA
Creating clippings - Animations with sound effects - Adding audio or Video - Windows Media Player ActiveX Control - Agent control - Embedding VRML in a web page - Real Player ActiveX control.

UNIT V APPLICATIONS
Creating web site with a particular theme using all the utilities - Graphics - Animations and Interaction.

TOTAL : 45 PERIODS

REFERENCES:
MC9274  HUMAN RESOURCE MANAGEMENT  LT P C  3 0 0 3

UNIT I  PERSPECTIVES IN HUMAN RESOURCE MANAGEMENT  9

UNIT II  THE CONCEPT OF BEST FIT EMPLOYEE  9

UNIT III  TRAINING AND EXECUTIVE DEVELOPMENT  9
Types of training, methods, purpose, benefits and resistance. Executive development programmes – common practices - benefits – self development – knowledge management.

UNIT IV  SUSTAINING EMPLOYEE INTEREST  9

UNIT V  PERFORMANCE EVALUATION AND CONTROL PROCESS  9

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:

MC9276  ADVANCED DATABASES  LT P C  3 0 0 3

UNIT I  PARALLEL AND DISTRIBUTED DATABASES  9
UNIT II  OBJECT AND OBJECT RELATIONAL DATABASES  9
Concepts for Object Databases: Object Identity – Object structure – Type Constructors –
Encapsulation of Operations – Methods – Persistence – Type and Class Hierarchies –
Inheritance – Complex Objects – Object Database Standards, Languages and Design:
ODMG Model – ODL – OQL – Object Relational and Extended – Relational Systems:
Object Relational feature in SQL/Oracle – Case Studies.

UNIT III  XML DATABASES  9
Databases – JDBC – Information Retrieval – Data Warehousing – Data Mining

UNIT IV  MOBILE DATABASES  9
Mobile Databases: Location and Handoff Management - Effect of Mobility on Data
Management - Location Dependent Data Distribution - Mobile Transaction Models -
Concurrency Control - Transaction Commit Protocols - Mobile Database Recovery
Schemes

UNIT V  MULTIMEDIA DATABASES  9
Multidimensional Data Structures – Image Databases – Text/Document Databases-
Video Databases – Audio Databases – Multimedia Database Design.

TOTAL : 45 PERIODS

REFERENCES:
4. C.J.Date, A.Kannan and S.Swamynathan,”An Introduction to Database Systems”,
UNIT III  QUALITY MANAGEMENT SYSTEM  9

UNIT IV  PRINCIPLES AND PRACTICES IN QMS  9

UNIT V  MEASURES AND METRICS IN PROCESS AND PROJECT DOMAINS  9

REFERENCES:

MC9278  TCP/IP DESIGN AND IMPLEMENTATION  LT P C
3 0 0 3

UNIT I  INTRODUCTION  9

UNIT II  TCP  9

UNIT III  IP IMPLEMENTATION  9
IP global software organization – routing table– routing algorithms–fragmentation and reassembly– error processing (ICMP) –Multicast Processing (IGMP).
UNIT IV TCP IMPLEMENTATION I
Data structure and input processing – transmission control blocks – segment format – comparison – finite state machine implementation – Output processing – mutual exclusion – computing the TCP data length.

UNIT V TCP IMPLEMENTATION II

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:
REFERENCES:

MC9280 DATA MINING AND DATA WAREHOUSING LT P C
30 0 3

UNIT I

UNIT II
Association Rule Mining: - Efficient and Scalable Frequent Item set Mining Methods – Mining Various Kinds of Association Rules – Association Mining to Correlation Analysis – Constraint-Based Association Mining.

UNIT III

UNIT IV

UNIT V

TOTAL : 45 PERIODS
REFERENCES

MC9281 COMPONENT BASED TECHNOLOGY LT P C
UNIT I INTRODUCTION

UNIT II JAVA COMPONENT TECHNOLOGIES

UNIT III CORBA TECHNOLOGIES

UNIT IV COM AND .NET TECHNOLOGIES

UNIT V COMPONENT FRAMEWORKS AND DEVELOPMENT

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT I  INTRODUCTION TO MANAGERIAL ECONOMICS  9

UNIT II  SUPPLY, PRODUCTION AND COST ANALYSIS  9

UNIT III  MARKET STRUCTURE AND PRICE DETERMINATION  9

UNIT IV  PROFIT AND INVESTMENT ANALYSIS  9

UNIT V  MACROECONOMIC ISSUE  9

TOTAL : 45 PERIODS

TEXT BOOK:

REFERENCES:
UNIT I  WIRELESS COMMUNICATION FUNDAMENTALS  9

UNIT II  TELECOMMUNICATION SYSTEMS  11

UNIT III  WIRELESS NETWORKS  9

UNIT IV  NETWORK LAYER  9

UNIT V  TRANSPORT AND APPLICATION LAYERS  7

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT II  IMAGE ENHANCEMENT  9

UNIT III  IMAGE SEGMENTATION AND FEATURE ANALYSIS  9

UNIT IV  MULTI RESOLUTION ANALYSIS AND COMPRESSIONS  9

UNIT V  APPLICATIONS OF IMAGE PROCESSING  9

TOTAL : 45 PERIODS

REFERENCES:

MC9285  ENTERPRISE RESOURCE PLANNING  LT P C
3 0 0 3

UNIT I  INTRODUCTION TO ERP  9

UNIT II  ERP IMPLEMENTATION  9

UNIT III  BUSINESS MODULES  9

UNIT IV  ERP MARKET  9
UNIT V ERP – PRESENT AND FUTURE

Turbo Charge the ERP System – EIA – ERP and E-Commerce – ERP and Internet – Future Directions in ERP.

REFERENCES:

MC9286 AGENT BASED INTELLIGENT SYSTEMS

UNIT I INTRODUCTION

UNIT II KNOWLEDGE REPRESENTATION AND REASONING
Logical Agents-First order logic-First Order Inference-Unification-Chaining- Resolution Strategies-Knowledge Representation-Objects-Actions-Events

UNIT III PLANNING AGENTS

UNIT IV AGENTS AND UNCERTAINTY

UNIT V HIGHER LEVEL AGENTS
Knowledge in Learning-Relevance Information-Statistical Learning Methods-Reinforcement Learning-Communication-Formal Grammar-Augmented Grammars-Future of AI.

REFERENCES:
## MC9287  NATURAL LANGUAGE PROCESSING  
### L T P C  3 0 0 3  

### UNIT I  INTRODUCTION  

### UNIT II  INFORMATION RETRIEVAL  

### UNIT III  TEXT MINING  
Categorization – Extraction based Categorization- Clustering- Hierarchical Clustering- Document Classification and routing- finding and organizing answers from Text search – use of categories and clusters for organising retrieval results – Text Categorization and efficient Summarization using Lexical Chains – Pattern Extraction.

### UNIT IV  GENERIC ISSUES  

### UNIT V  APPLICATIONS  

## TOTAL : 45 PERIODS  

### TEXT BOOKS:  

### REFERENCES:  

36
UNIT I AGENTS – OVERVIEW
Agent Definition – Agent Programming Paradigms – Agent Vs Object – Aglet – Mobile Agents – Agent Frameworks – Agent Reasoning.

UNIT II JAVA AGENTS

UNIT III MULTIAGENT SYSTEMS

UNIT IV INTELLIGENT SOFTWARE AGENTS
Interface Agents – Agent Communication Languages – Agent Knowledge Representation – Agent Adaptability – Belief Desire Intension – Mobile Agent Applications.

UNIT V AGENTS AND SECURITY

TOTAL : 45 PERIODS

REFERENCES:

UNIT I BUILDING BLOCKS, PERFORMANCE MEASURES, DECISIONS

UNIT II SUPPLY CHAIN INVENTORY MANAGEMENT
Economic Order Quantity Models – Reorder Point Models – Multichelon Inventory Systems.

UNIT III MATHEMATICAL FOUNDATIONS OF SUPPLY CHAIN SOLUTIONS
UNIT IV     INTERNET TECHNOLOGIES AND ELECTRONIC COMMERCE IN SCM

UNIT V     CASE STUDIES
Digital Equipment Case Study – IBM Case Study.

REFERENCES:

MC9290     HEALTHCARE SYSTEMS

UNIT I     INTRODUCTION
Introduction to health care information – Health care data quality – Health care information regulations, laws and standards.

UNIT II     HEALTH CARE INFORMATION SYSTEMS
History and evolution of health care information systems – Current and emerging use of clinical information systems – System acquisition – System implementation and support.

UNIT III     INFORMATION TECHNOLOGY
Information architecture and technologies that support health care information systems – Health care information system standards – Security of health care information systems.

UNIT IV     MANAGEMENT OF IT CHALLENGES
Organizing information technology services – IT alignment and strategic planning – IT governance and management.

UNIT V     IT INITIATIVES
Management’s role in major IT initiatives – Assessing and achieving value in health care information systems.

TOTAL : 45 PERIODS

38
MC9291 PORTFOLIO MANAGEMENT LT P C 3 0 0 3

UNIT I MONEY AND CAPITAL MARKETS 8
Trends of saving and financial flow, the Indian Money market, introduction, characteristics of money market, need for money market, major segments of money market, money market instruments and Capital market, introduction, primary market and secondary market, recent capital market reforms, new capital issue, instruments and market participant

UNIT II STOCK EXCHANGES 10

UNIT III FUNDAMENTAL ANALYSIS 8

UNIT IV TECHNICAL ANALYSIS 10

UNIT V PORTFOLIO ANALYSIS 9
Portfolio theory - Markowitz theory, Sharpe index model, CAPM, Portfolio investment model- basic principles, planning, implementation, portfolio objective and types, Portfolio evaluation - measures of return, formula plans, types of formula plans, Risk adjusted measure of performance - Sharpe's measure, Treynor's measure and Jensen's measure

TOTAL : 45 PERIODS

TEXT BOOKS:
REFERENCES:
1. Punithavathy Pandian, Security Analysis & Portfolio Management – Vikas Publishing
2. V.A.Avadhani – Securities Analysis & Portfolio Management – Himalaya Publishing

MC9292        UNIX INTERNALS    LT P C
              3 0 0 3

UNIT I  OVERVIEW
General Overview of the System : History – System structure – User perspective –
Operating system services – Assumptions about hardware. Introduction to the Kernel :
Architecture of the UNIX operating system – Introduction to system concepts. The Buffer
Cache: Buffer headers – Structure of the buffer pool – Scenarios for retrieval of a buffer –
Reading and writing disk blocks – Advantages and disadvantages of the buffer cache.

UNIT II  FILE SUBSYSTEM
Internal representation of files: Inodes – Structure of a regular file – Directories –
Conversion of a path name to an Inode – Super block – Inode assignment to a new file –
Allocation of disk blocks.

UNIT III  SYSTEM CALLS FOR THE FILE SYSTEM
Open – Read – Write – File and record locking – Adjusting the position of file I/O –
link – unlink.

UNIT IV  PROCESSES
Process states and transitions – Layout of system memory – The context of a process –
Saving the context of a process – Manipulation of the process address space - Sleep.
Process Control : Process creation – Signals – Process termination – Awaiting process
termination – Invoking other programs – user id of a process – Changing the size of a
process - Shell – System boot and the INIT process– Process Scheduling.

UNIT V  MEMORY MANAGEMENT AND I/O
Memory Management Policies : Swapping – Demand paging. The I/O Subsystem :
Driver Interface – Disk Drivers – Terminal Drivers– Streams – Inter process
communication.

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:
MC9293                          COMPILER DESIGN                          LT P C
                                                                                         3 0 0 3

UNIT I  LEXICAL ANALYSIS  9
Compilers – Analysis of Source Program – Phases of Compiler – Compiler Construction
Tools – Role of a Lexical Analyzer – Specification and Recognition of Tokens – Finite
Automata – Regular Expression to Finite Automation.

UNIT II  SYNTAX ANALYSIS  9
Role of a Parser – Context Free Grammars – Top-Down Parsing – Bottom-Up Parsing –
LEX and YACC.

UNIT III  INTERMEDIATE CODE GENERATION  9
Intermediate Languages – Declaration – Assignment Statements – Boolean Expressions
– Flow Control Statements – Back Patching.

UNIT IV  CODE OPTIMIZATION  9
Introduction to Code Optimization – Principal Sources of Optimization – Basic Blocks

UNIT V  CODE GENERATION  9
Issues in the Design of a Code Generator – Run-Time Storage Management – Next Use
Information – A Simple Code Generator – DAG Representation of Basic Blocks –
Peephole Optimization – Code Generation from DAG.

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:

MC9294                          ARTIFICIAL INTELLIGENCE                          LT P C
                                                                                         3 0 0 3

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 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 – 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

UNIT IV LEARNING 9

UNIT V APPLICATIONS 8

TOTAL : 45 PERIODS

REFERENCES
UNIT IV  FAULT TOLERANCE AND DISTRIBUTED FILE SYSTEMS  10

UNIT V  CASE STUDIES  9

TOTAL : 45 PERIODS

TEXT BOOKS:

MC9296  SOFT COMPUTING  LT P C
3 0 0 3

UNIT I  INTRODUCTION TO SOFT COMPUTING AND NEURAL NETWORKS  9
Evolution of Computing - Soft Computing Constituents – From Conventional AI to Computational Intelligence - Machine Learning Basics

UNIT II  GENETIC ALGORITHMS  9
Introduction to Genetic Algorithms (GA) – Applications of GA in Machine Learning - Machine Learning Approach to Knowledge Acquisition.

UNIT III  NEURAL NETWORKS  9

UNIT IV  FUZZY LOGIC  9

UNIT V  NEURO-FUZZY MODELING  9

TOTAL : 45 PERIODS
TEXT BOOKS:

REFERENCES: