

NATIONAL ENGINEERING COLLEGE

(An Autonomous Institution – Affiliated to Anna University Chennai)

K.R.NAGAR, KOVILPATTI – 628 503

www.nec.edu.in

REGULATIONS - 2013



**DEPARTMENT OF
COMPUTER SCIENCE AND ENGINEERING**

**CURRICULUM AND SYLLABI OF
M.C.A – MASTER OF COMPUTER APPLICATIONS**

REGULATIONS - 2013
Curriculum and Syllabi of Full Time
M.C.A. – Master of Computer Applications

SEMESTER - I

| Sl. No. | Course Code | Course Title | L | T | P | C |
|------------------|-------------|--|-----------|----------|----------|-----------|
| Theory | | | | | | |
| 1. | MCC11 | Computer Organization | 3 | 0 | 0 | 3 |
| 2. | MCC12 | Problem Solving and C Programming | 3 | 0 | 0 | 3 |
| 3. | MCC13 | Database Management Systems | 3 | 0 | 0 | 3 |
| 4. | MCC14 | Data Structures | 3 | 0 | 0 | 3 |
| 5. | MCC15 | Mathematical Foundations of Computer Science | 3 | 1 | 0 | 4 |
| Practical | | | | | | |
| 6. | MCC16 | C and Data Structures Laboratory | 0 | 0 | 3 | 2 |
| 7. | MCC17 | Database Management Systems Laboratory | 0 | 0 | 3 | 2 |
| TOTAL | | | 15 | 1 | 6 | 20 |

SEMESTER - II

| Sl. No. | Course Code | Course Title | L | T | P | C |
|------------------|-------------|--|-----------|----------|----------|-----------|
| Theory | | | | | | |
| 1. | MCC21 | Object Oriented Programming | 3 | 1 | 0 | 4 |
| 2. | MCC22 | Design and Analysis of Algorithms | 3 | 1 | 0 | 4 |
| 3. | MCC23 | System Software | 3 | 0 | 0 | 3 |
| 4. | MCC24 | Operating Systems | 3 | 0 | 0 | 3 |
| 5. | MCC25 | Software Engineering | 3 | 0 | 0 | 3 |
| Practical | | | | | | |
| 6. | MCC26 | Object Oriented Programming Laboratory | 0 | 0 | 3 | 2 |
| 7. | MCC27 | System Programming Laboratory | 0 | 0 | 3 | 2 |
| 8. | MCC28 | Communication Skills Laboratory | 1 | 0 | 2 | 2 |
| TOTAL | | | 16 | 2 | 8 | 23 |

SEMESTER - III

| Sl. No. | Course Code | Course Title | L | T | P | C |
|------------------|-------------|-------------------------------------|-----------|----------|----------|-----------|
| Theory | | | | | | |
| 1. | MCC31 | Java Programming | 3 | 0 | 0 | 3 |
| 2. | MCC32 | Object Oriented Analysis and Design | 3 | 0 | 0 | 3 |
| 3. | MCC33 | Computer Graphics | 3 | 0 | 0 | 3 |
| 4. | MCC34 | Computer Networks | 3 | 0 | 0 | 3 |
| 5. | MCC35 | Resource Management Techniques | 3 | 0 | 0 | 3 |
| Practical | | | | | | |
| 6. | MCC36 | Java Programming Laboratory | 0 | 0 | 3 | 2 |
| 7. | MCC37 | Case Tools Laboratory | 0 | 0 | 3 | 2 |
| 8. | MCC38 | Graphics Laboratory | 0 | 0 | 3 | 2 |
| TOTAL | | | 15 | 0 | 9 | 21 |

SEMESTER - IV

| Sl. No. | Course Code | Course Title | L | T | P | C |
|------------------|-------------|--------------------------------|-----------|----------|----------|-----------|
| Theory | | | | | | |
| 1. | MCC41 | Network Programming | 3 | 0 | 0 | 3 |
| 2. | MCC42 | Web Programming | 3 | 0 | 0 | 3 |
| 3. | MCC43 | Compiler Design | 3 | 0 | 0 | 3 |
| 4. | | Elective - I | 3 | 0 | 0 | 3 |
| 5. | | Elective - II | 3 | 0 | 0 | 3 |
| Practical | | | | | | |
| 6. | MCC44 | Network Programming Laboratory | 0 | 0 | 3 | 2 |
| 7. | MCC45 | Web Programming Laboratory | 0 | 0 | 3 | 2 |
| 8. | MCC46 | Compiler Design Laboratory | 0 | 0 | 3 | 2 |
| TOTAL | | | 15 | 0 | 9 | 21 |

SEMESTER – V

| Sl. No. | Course Code | Course Title | L | T | P | C |
|------------------|-------------|---------------------------------|-----------|----------|----------|-----------|
| Theory | | | | | | |
| 1. | MCC51 | .NET Programming and Scripts | 3 | 0 | 0 | 3 |
| 2. | MCC52 | XML and Web Services | 3 | 0 | 0 | 3 |
| 3. | | Elective – III | 3 | 0 | 0 | 3 |
| 4. | | Elective – IV | 3 | 0 | 0 | 3 |
| 5. | | Elective – V | 3 | 0 | 0 | 3 |
| Practical | | | | | | |
| 6. | MCC53 | XML and Web Services Laboratory | 0 | 0 | 3 | 2 |
| 7. | MCC54 | .NET Programming Laboratory | 0 | 0 | 3 | 2 |
| 8. | MCC55 | Mini Project Work | 0 | 0 | 3 | 2 |
| TOTAL | | | 15 | 0 | 9 | 21 |

SEMESTER – VI

| Sl. No. | Course Code | Course Title | L | T | P | C |
|------------------|-------------|--------------|----------|----------|-----------|-----------|
| Practical | | | | | | |
| 1. | MCC61 | Project Work | 0 | 0 | 24 | 12 |
| TOTAL | | | 0 | 0 | 24 | 12 |

TOTAL CREDITS TO BE EARNED FOR THE AWARD OF THE DEGREE - 118

LIST OF ELECTIVES OF IV SEMESTER

| Sl. No. | Course Code | Course Title | L | T | P | C |
|---------|-------------|-----------------------------------|---|---|---|---|
| 1. | MCE4A | Numerical and Statistical Methods | 3 | 0 | 0 | 3 |
| 2. | MCE4B | Electronic Commerce | 3 | 0 | 0 | 3 |
| 3. | MCE4C | Information Systems | 3 | 0 | 0 | 3 |
| 4. | MCE4D | Web Graphics | 3 | 0 | 0 | 3 |
| 5. | MCE4E | Advanced Databases | 3 | 0 | 0 | 3 |
| 6. | MCE4F | Software Quality Management | 3 | 0 | 0 | 3 |
| 7. | MCE4G | TCP/IP Design and Implementation | 3 | 0 | 0 | 3 |
| 8. | MCE4H | Distributed Systems | 3 | 0 | 0 | 3 |
| 9. | MCE4J | Unix Internals | 3 | 0 | 0 | 3 |
| 10. | MCE4K | Visual Programming | 3 | 0 | 0 | 3 |

LIST OF ELECTIVES OF V SEMESTER

| Sl. No. | Course Code | Course Title | L | T | P | C |
|---------|-------------|--|---|---|---|---|
| 1. | MCE5A | Human Resource Management | 3 | 0 | 0 | 3 |
| 2. | MCE5B | Data Mining and Data Warehousing | 3 | 0 | 0 | 3 |
| 3. | MCE5C | Component Based Technology | 3 | 0 | 0 | 3 |
| 4. | MCE5D | Managerial Economics | 3 | 0 | 0 | 3 |
| 5. | MCE5E | Mobile Computing | 3 | 0 | 0 | 3 |
| 6. | MCE5F | Digital Imaging | 3 | 0 | 0 | 3 |
| 7. | MCE5G | Enterprise Resource Planning | 3 | 0 | 0 | 3 |
| 8. | MCE5H | Agent Based Intelligent Systems | 3 | 0 | 0 | 3 |
| 9. | MCE5J | Natural Language Processing | 3 | 0 | 0 | 3 |
| 10. | MCE5K | Software Agents | 3 | 0 | 0 | 3 |
| 11. | MCE5L | Supply Chain Management | 3 | 0 | 0 | 3 |
| 12. | MCE5M | Healthcare for IT Services | 3 | 0 | 0 | 3 |
| 13. | MCE5N | Portfolio Management | 3 | 0 | 0 | 3 |
| 14. | MCE5P | Artificial Intelligence | 3 | 0 | 0 | 3 |
| 15. | MCE5Q | Parallel and Distributed Computing | 3 | 0 | 0 | 3 |
| 16. | MCE5R | Soft Computing | 3 | 0 | 0 | 3 |
| 17. | MCE5S | Software Project Management | 3 | 0 | 0 | 3 |
| 18. | MCE5T | Professional Ethics | 3 | 0 | 0 | 3 |
| 19. | MCE5V | Mobile Engineering | 3 | 0 | 0 | 3 |
| 20. | MCE5W | Infrastructure Administration and Management | 3 | 0 | 0 | 3 |

MCC12 PROBLEM SOLVING AND C PROGRAMMING

L T P C
3 0 0 3

OBJECTIVES

- To learn and analyze problems and formulate algorithms.
- To learn the fundamentals of C.
- To understand the usage of arrays, functions and structures.
- To study the importance of pointers and files.

UNIT I INTRODUCTION TO PROGRAMMING

9

Introduction to computing – Building blocks for simple programs – Problem to Program – Problem Solving with Decision Structures – Problem Solving with Loop Structures – Problem Analysis – Programming Style – Documentation and Testing – Procedural – Functional – Recursive – Rule-based – Structured programming.

UNIT II C PROGRAMMING BASICS

9

Introduction to C programming – Constants – Variables – Data Types – Storage classes – Operators – Managing Input and Output Operations – Decision Making and Branching – Looping Statements – Solving Simple Scientific and Statistical Problems.

UNIT III ARRAYS AND FUNCTIONS

9

Arrays – One dimensional and two dimensional arrays - String – String operations – String Arrays – Functions – Call by value – Call by reference – Recursion.

UNIT IV STRUCTURES AND UNIONS

9

Introduction – Need for structure – Structure Declaration – Structure Definition – Nested Structures – Unions – Programs using Structures and Unions – Pre-processor Directives.

UNIT V POINTERS AND FILE MANIPULATION

9

Pointers – Definition – Initialization – Pointer Arithmetic – Pointers with Arrays – Dynamic Memory Allocation – FILE Pointers – File Operation: Creation, Copy, Delete, Update – File Type: Text File and Binary File.

TOTAL: 45

TEXT BOOKS

1. Ashok N. Kamthane, “Computer programming”, 1st Edition, Pearson Education, 2007.
2. Yashavant P. Kanetkar, “Let Us C”, 12th Edition, BPB Publications, 2012.
3. Kernigan Brian W, Dennis M. Ritchie, “The C Programming Language”, 2nd Edition, Prentice Hall, 2006.

REFERENCES

1. Maureen Sprankle, “Problem Solving and Programming Concepts”, 7th Edition, Pearson Education, 2009.
2. Deitel and Deitel, “C How to program”, 2nd Edition, Prentice Hall, 1994.
3. Cormen, Leiserson, Rivest, Stein “Introduction to algorithms”, 2nd Edition, McGraw Hill publishers, 2002.
4. Stephen G.Kochan “Programming in C”, 3rd Edition, Pearson Education, 2008.

MCC13 DATABASE MANAGEMENT SYSTEMS

L T P C
3 0 0 3

OBJECTIVES

- To understand the basics of Database Management System.
- To use Standard Query Language.
- To understand normalization techniques.
- To understand importance of backup and recovery techniques.

UNIT I INTRODUCTION 8

Purpose of Database Systems – View of Data – Relational Databases – Database Design – Database Architecture – Database users and Administrators – Database Schema – Keys – Relational algebra – Tuple Relational Calculus – Domain Relational Calculus.

UNIT II SQL, PROGRAMMING AND TRIGGERS 11

SQL Data Definition – Basic Structure of SQL Queries – Basic Operations – Set Operations – Aggregate Functions – Nested Subqueries – Modification of the Database – Join Expressions – Views – Transactions – Integrity Constraints – Authorization – Functions and Procedures – Triggers.

UNIT III NORMAL FORMS, STORAGE AND FILE STRUCTURE 9

Introduction to Normal Forms – Normalization using Functional and Multivalued Dependencies – Overview of Physical Storage Media – Magnetic Disk and Flash Storage – RAID – File Organization – Organization of Records in Files – Ordered Indices – B⁺ Tree Index Files.

UNIT IV HASHING, QUERY PROCESSING AND TRANSACTION 7

Static and Dynamic Hashing – Overview of Query Processing and Query Optimization – Measures of Query cost. Transaction: Transaction concepts – Transaction state – Serializability.

UNIT V CONCURRENCY CONTROL AND RECOVERY SYSTEM 10

Concurrency control: Lock-Based Protocols - Deadlock Handling – Multiple granularity – Timestamp-Based Protocols – Thomas' Write Rule – Validation-Based Protocols. Recovery System: Failure Classification – Storage structure – Recovery and Atomicity – Log-Based Recovery – Shadow Paging – Recovery with Concurrent Transactions.

TOTAL : 45

TEXT BOOK

1. Abraham Silberschatz, Henry. F. Korth and S. Sudharshan, "Database system Concepts", 6th Edition, McGraw-Hill Publishers, 2010.

REFERENCES

1. Raghu RamaKrishnan, Johannes Gehrke, "Database Management Systems", 3rd Edition, McGraw Hill Publishers, 2003.
2. C. J. Date, "An Introduction to Database Systems", 7th Edition, Addison Wesley Publishers, 1997.

MCC14

DATA STRUCTURES

L T P C
3 0 0 3

OBJECTIVES

- To learn about the basic linear data structures, their implementations and applications.
- To make the students to study about non linear data structures.
- To learn about various sorting types and its efficiency.
- To make the students to learn about hashing techniques.

UNIT I LINEAR DATA STRUCTURES

9

Elementary Data Structures – ADT – List ADT: Array based Implementation – Doubly and Circularly Linked Lists – Cursor based Linked List – Applications of List – The stack ADT: Model – Implementation – Applications – The Queue ADT: Model – Implementation – Applications.

UNIT II TREE STRUCTURES AND BALANCED TREES

9

Trees - Preliminaries – implementation of Tree – Tree Traversals – Binary tree Implementation – Expression Tree – The Search Tree ADT – Binary Search Tree Operations – AVL tree – Splay tree – B-Tree – Binary Heap: Structure Property – Heap Order Property – Heap Operations – d-heaps.

UNIT III GRAPH

9

Graph - Representation of Graphs – Bi-connectivity – Topological sort – Graph Traversal: Breadth-First Traversal – Depth-First Traversal – Shortest path Algorithms: Minimum Spanning Tree – Prim's and Kruskal's Algorithms – Applications of Graph.

UNIT IV SORTING

9

Sorting – Lower Bound for Simple Sorting Algorithms – Internal and External Sorting: Bubble Sort – Insertion Sort – Shell Sort – Merge Sort – Heap Sort – Quick Sort – Bucket Sort – Radix Sort – Distribution Sort – Shuffle Sort.

UNIT V HASHING AND SET

9

Hashing: Hash function – Open hashing – Closed hashing – Double hashing – Extendible hashing – Rehashing. The Disjoint set ADT: Equivalence Relations – Dynamic Equivalence Problem – Smart Union Algorithms – Path compression – Applications of Set.

TOTAL: 45

TEXT BOOK

1. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C”, 2nd Edition, Pearson Education, 2012.

REFERENCES

1. Clifford A. Shaffer, “Data Structures and Algorithm Analysis”, 3rd Edition, Dover Publications, 2013.
2. Richard F. Gilberg, Behrouz A. Forouzan, “Data Structures: A Pseudocode Approach with C”, 2nd Edition, Cengage Learning, 2004.
3. Narasimha Karumanchi, “Data Structures and Algorithms Made Easy”, 2nd Edition, Career Monk Publications, 2011.

MCC15 MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE L T P C
3 1 0 4

OBJECTIVES

- To learn about the basic linear algebra concepts.
- To understand the relations and logics of computer science.
- To make the students to understand the basics of network theory using graph.

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 SETS, RELATIONS AND FUNCTIONS 12

Sets – Basic Definitions – Set operations – Laws of set theory – Principles of inclusion and exclusion – Relations – Properties of relations – Matrices of relations – Closure operations on relations – Functions: injective - surjective – bijective.

UNIT III MATHEMATICAL LOGIC 12

Propositions and logical operators – Truth table – Propositions generated by a set – Equivalences and implications – Basic laws – Some more connectives – Functionally complete set of connectives – Normal forms – Proofs in Propositional 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 GRAPH THEORY 12

Graph – Special types of graphs – Sub graph – Graph isomorphism – Euler graph – Hamiltonian graph.

TOTAL: 60

TEXT BOOKS

1. Kenneth H.Rosen, “Discrete Mathematics and Its Applications”, 4th Edition, Tata McGraw Hill, 2002
2. J.P.Trembly, R.Manohar “Discrete Mathematical Structures with Applications to Computer Science”, Tata McGraw-Hill, 1997

REFERENCES

1. Hopcroft, Ullman, “Introduction to Automata Theory, Languages and Computation”, Narosa Publishing House, 2002.
2. Narsingh Deo, “Graph Theory with applications to Engineering and Computer Science”, Reprint, Prentice-Hall of India Pvt.Ltd, 2006.
3. A.Tamilarasi, A.M.Natarajan, “Discrete Mathematics and its Application”, 2nd Edition, Khanna Publishers, 2005.
4. M.K.Venkataraman “Engineering Mathematics”, Volume II, 2nd Edition, National Publishing Company, 1989.

MCC16 C AND DATA STRUCTURES LABORATORY

L T P C
0 0 3 2

OBJECTIVES

- To implement various operations on linear data structures.
- To perform the various tree traversals in binary tree.
- To implement various internal and external sorting techniques.
- To implement shortest path algorithms using Floyd's algorithm and Warshall's algorithm.
- To implement minimum spanning tree of graph using Prim's algorithm and Kruskals algorithm.

List of Experiments:

1. Write a program to perform the following operations on single linked list:
i) Creation ii) Insertion iii) Deletion iv) Reversal v) Sorting vi) Traversal
2. a) Write a program that uses functions to perform the following operations on Double linked list:
i) Creation ii) Insertion iii) Deletion iv) Traversal
b) Write a program to create and traverse a circular single linked list
3. a) Write a program to create a stack using array and linked list and perform the following operations:
i) push ii) pop iii) display
b) Write a program to create a queue using array and linked list and perform the following operations:
i) insert ii) delete iii) display
4. Write a program to perform the following stack applications:
i) Convert infix expression into postfix expression
ii) Evaluation of postfix expression
5. Write the program to perform the following traversal in Binary tree
i) Inorder traversal ii) Preorder traversal iii) Postorder traversal
6. Write a program to perform the following operations in Binary Search Tree (BST):
i) Creation ii) Insertion iii) Deletion iv) Traversal
7. Write a program that implement the following sorting techniques:
i) Bubble sort ii) Insertion sort iii) Selection sort
8. Write a program that implement the following sorting techniques:
i) Quick sort ii) Merge sort iii) Heap sort
9. Write a program to perform following Traversal in Graph
i) Breadth First Search, ii) Depth first search
10. Write a program to find out the shortest path between every vertex in Graph using the following algorithms
i) Floyd's algorithm ii) Warshall's algorithm
11. Write a program to find out the shortest path in Graph using the following algorithms
i) Prim's algorithm ii) Kruskal's Algorithm
12. Write a program to implement Huffman's Algorithm.

Required Software: C/C++

MCC17 DATABASE MANAGEMENT SYSTEMS LABORATORY L T P C
0 0 3 2

OBJECTIVES

- To implement the Basic Queries.
- To implement the SQL program.
- To implement the GUI program.

List of Experiments

1. Execute DDL commands for tables like Bank Management System.
2. Execute DML commands for table for Student Processing System.
3. Execute and manipulate the views for Bank Management System.
4. Apply different joins like equi-join and outer join by relating two or more tables in Payroll processing system.
5. Manipulate student processing system using SET operations and Aggregate functions.
6. Execute Built-in functions for Characters, Numbers and Date.
7. Write basic PL/SQL programming for the following:
 - a) Write a programme to find the factorial of a number.
 - b) Find odd and even numbers from 100 to 1000.
 - c) Write a program to input 2 numbers if the 1st no >2nd no then swap it, else if 1st no < 2nd no doubles it else multiply 10 with both numbers?
 - d) Write a program to input 2 numbers and an operator, and display the result.
 - e) Print multiplication table from 1 to a given Number.
8. Do Advanced PL/SQL programming using
 - a) Cursors b) Procedures c) Triggers
9. Create Forms, Menus and Report for
 - a) Payroll Processing System
 - b) Bank Management System
 - c) Library Management System

Required Software: Oracle, Visual Basic.

MCC21 OBJECT ORIENTED PROGRAMMING

L T P C
3 1 0 4

OBJECTIVES

- To understand the fundamentals of OOP's Concepts.
- To understand the C++ Concepts.
- To understand the file operations in C++.

UNIT I FUNDAMENTALS

10

Object Oriented Programming Concepts: Objects - Classes – Methods – Messages – Abstraction and Encapsulation – Inheritance – Abstract Classes – Polymorphism. Introduction to C++: Classes – Access Specifiers – Function and Data Members – Default Arguments – Static Members – Class Objects – Pointers and Objects – Constant Objects – Nested Classes – Local Classes.

UNIT II FUNCTIONS, CONSTRUCTORS AND DESTRUCTORS

15

Function: Inline Function – Difference between member and non-member function – Call by reference and Return by reference – Function Overloading – Friend Function – Const and Volatile Functions – Static Function – Private and Public functions – Function Pointer. Constructor: Default and Explicit Constructors – Parameterized Constructors – Constructor Overloading – Dynamic Constructor – Copy Constructor – Destructors.

UNIT III INHERITANCE AND POLYMORPHISM

15

Need of Inheritance - public, private, and protected derivations – Access control. Types of inheritance: Single inheritance, Multilevel inheritance, Multiple inheritance, Hierarchical inheritance and Hybrid inheritance – Virtual base classes – Constructors in derived class. Pointers – Pointers to Objects – this Pointer – Pointers to derived classes - Virtual and Pure Virtual Functions – Virtual Constructors and Destructors.

UNIT IV I/O FORMATTING AND FILE HANDLING

9

Streams and Formatted I/O: C++ stream for console I/O operations – Classes Hierarchy – Formatted and unformatted I/O – Formatting I/O. File handling: Classes for file stream operations - Opening and Closing a file – End of file detection – File Pointers and their manipulations - Random access – Error handling during file operations.

UNIT V TEMPLATES

11

Drawbacks of Macros - Function Templates – Function Templates with Multiple / Two Generic Arguments – Overloading of Template Function – Member Function Templates – Class Templates – Class Template with Multiple Arguments – Exception Handling.

L : 45 T : 15 TOTAL : 60

TEXT BOOKS

1. Bhushan Trivedi, “Programming with ANSI C++- A Step-by-Step Approach”, 4th Impression, Oxford University Press, 2012.
2. E.Balagurusamy, “Object Oriented Programming with C++”, 5th Edition, McGraw Hill Education, 2012.

REFERENCES

1. Robert Lafore, “Object oriented Programming in C++”, 4th Edition, Sams Publishing, 2002.
2. Stanley B. Lippman, Josee Lajoie, Barbara E. Moo, “C++ Primer”, 4th Edition, Addison Wesley Professional Publisher, 2005.

MCC23 SYSTEM SOFTWARE

L T P C
3 0 0 3

OBJECTIVES

- To discuss the machine architecture of SIC & SIC/XE.
- To elaborate the functionality of an assembler, loader and linker with necessary data structures.
- To differentiate between machine dependent and machine independent assembler features.
- To design assemblers, loaders, linkers and text editors.
- To describe the functionality of macro processors.

UNIT I INTRODUCTION 9

Introduction – System software and machine architecture – The Simplified Instructional Computer (SIC) – Machine Architectures (SIC and SIC/XE) – Data and Instruction Formats – Addressing Modes – Instruction sets – I/O.

UNIT II ASSEMBLERS 9

Basic assembler functions – A simple SIC assembler – Assembler algorithms and Data Structures – Machine dependent assembler features: Instruction formats and addressing modes – Program relocation. Machine independent assembler features: Literals – Symbol-defining statements – Expressions – Program Blocks – Control Sections and Program Linking. One-Pass Assembler and Multi-pass Assembler – Implementation examples: MASM assembler.

UNIT III LOADERS AND LINKERS 9

Basic loader functions: Design of an Absolute Loader – A Simple Bootstrap Loader - Machine dependent loader features: Relocation – Program Linking – Algorithm and Data Structures for Linking Loader. Machine-independent loader features: Automatic Library Search – Loader Options - Loader design options: Linkage Editors – Dynamic Linking – Bootstrap Loaders - Implementation example: MSDOS linker.

UNIT IV MACRO PROCESSORS 9

Basic macro processor functions – Macro Definition and Expansion – Macro Processor Algorithm and Data Structures – Machine independent macro processor features: Concatenation of Macro Parameters – Generation of Unique Labels – Conditional Macro Expansion – Keyword Macro Parameters. Macro Processor Design Options: Recursive Macro Expansion – General Purpose macro Processors – Macro Processing within Language Translators - Implementation examples: MASM Macro Processor – ANSI C macro language.

UNIT V TEXT EDITOR AND DEBUGGER 9

Text editors – Overview of Editing Process – User Interface – Editor Structure – Interactive Debugging Systems – Debugging functions and capabilities – User Interface Criteria.

TOTAL: 45

TEXT BOOK

1. Leland L. Beck, “System Software – An Introduction to Systems Programming”, 3rd Edition, Pearson Education, 1999.

REFERENCE

1. D. M. Dhamdhare, “Systems Programming and Operating Systems”, 1st Edition, Tata McGraw-Hill Education, 2011.

MCC24 OPERATING SYSTEMS

L T P C
3 0 0 3

OBJECTIVES

- Understand how the operating system abstractions can be used in the development of application programs or to build higher level abstractions.
- Understand how the operating system abstractions can be implemented.
- Understand the principles of concurrency and synchronization, and apply them to write correct concurrent programs/software.
- Understand basic resource management techniques and principles and how they can be implemented. These also include issues of performance and fairness objectives, avoiding deadlocks, as well as security and protection.

UNIT I INTRODUCTION 9

Definition and types of operating systems – Batch Systems – multi programming – Time-sharing – parallel – Distributed and real-time systems – Operating system structure – Operating system components and services – System calls – System programs – Virtual machines.

UNIT II PROCESS MANAGEMENT 9

Process concept – Process scheduling – Cooperating processes – Threads – Interprocess communication – CPU scheduling criteria – Scheduling algorithms – Multiple-processor scheduling.

UNIT III PROCESS SYNCHRONIZATION AND DEADLOCKS 9

The Critical-Section problem – Synchronization hardware – Semaphores – Classical problems of synchronization – Critical regions – Monitors – Deadlocks – System model – Characterization – Deadlock prevention – Avoidance – Detection – Recovery from deadlock – Combined approach to deadlock handling.

UNIT IV STORAGE MANAGEMENT 9

Memory Management – Logical and Physical Address Space – Swapping – Contiguous Allocation – Paging – Segmentation – Virtual Memory – Demand paging and its performance – Page replacement algorithms – Thrashing – Demand segmentation – File systems – File concept – Access methods – Directory implementation – Efficiency and performance – Recovery – Disk structure – Disk scheduling methods.

UNIT V CASE STUDY 9

Case study – Introduction – Process – File system – Storage management (WINDOWS, UNIX and LINUX).

TOTAL: 45

TEXT BOOK

1. Abraham Siberschatz, Peter Baer Galvin, “Operating System Concepts”, 7th Edition, John Wiley & Sons, Reprint 2009.

REFERENCES

1. Richard Peterson, “Linux: The Complete Reference”, 6th Edition, McGraw-Hill, 2003.
2. Maurice J. Bach, “Design of the Unix Operating System”, Pearson Education, 1996.
3. William Stallings, “Operating systems: internals and design principles”, 6th Edition, Prentice Hall, 2008.

MCC25 SOFTWARE ENGINEERING

L T P C
3 0 0 3

OBJECTIVES

- To gain knowledge of basic software engineering methods and practices, and their appropriate application.
- A general understanding of software process models such as the waterfall and evolutionary models.
- An understanding of the role of project management software requirements SRS document, implementation issues, verification and validation reviews, software testing approaches, software evolution, version management and how to ensure good quality software.

UNIT I INTRODUCTION

9

Introduction to Software Engineering – Software Components – Software Characteristics – Software Crisis – Software Engineering Processes – Similarity and Differences from Conventional Engineering Processes – Software Quality Attributes. Software Development Life Cycle (SDLC) Models: Water Fall Model – Prototype Model – Spiral Model – Evolutionary Development Models – Iterative Enhancement Models.

UNIT II SOFTWARE REQUIREMENT SPECIFICATIONS (SRS)

9

Requirement Engineering Process: Elicitation – Analysis – Documentation – Review and Management of User Needs – Feasibility Study – Information Modeling – Data Flow Diagrams – Entity Relationship Diagrams – Decision Tables – SRS Document – IEEE Standards for SRS. Software Quality Assurance (SQA): Verification and Validation – SQA Plans – Software Quality Frameworks – ISO 9000 Models – CMM Model.

UNIT III SOFTWARE DESIGN

9

Basic Concept of Software Design – Architectural Design – Low Level Design: Modularization – Design Structure Charts – Flow Charts – Coupling and Cohesion Measures – Design Strategies: Function Oriented Design – Object Oriented Design – Top-Down and Bottom-Up Design. Software Measurement and Metrics: Various Size Oriented Measures – Halstead's Software Science – Function Point (FP) Based Measures – Cyclomatic Complexity Measures – Control Flow Graphs.

UNIT IV SOFTWARE TESTING

9

Testing Objectives – Unit Testing – Integration Testing – Acceptance Testing – Regression Testing – Testing for Functionality and Testing for Performance – Top-Down and Bottom-Up Testing Strategies: Test Drivers and Test Stubs – Structural Testing (White Box Testing) – Functional Testing (Black Box Testing) – Test Data Suit Preparation – Alpha and Beta Testing of Products. Static Testing Strategies: Formal Technical Reviews (Peer Reviews) – Walk Through – Code Inspection – Compliance with Design and Coding Standards.

UNIT V SOFTWARE MAINTENANCE

9

Need for Maintenance – Categories of Maintenance: Preventive – Corrective and Perfective Maintenance – Cost of Maintenance – Software Re-Engineering – Reverse Engineering. Software Configuration Management Activities – Change Control Process – Software Version Control – An Overview of CASE Tools.

TOTAL: 45

TEXT BOOK:

1. R. S. Pressman, "Software Engineering - A Practitioners Approach", 7th Edition, McGraw Hill, 2009.

REFERENCES:

1. K. K. Aggarwal and Yogesh Singh, "Software Engineering", 3rd Edition, New Age International Publishers, 2008.
2. Ian Sommerville, "Software Engineering", 9th Edition, Addison Wesley, 2010.

MCC26

OBJECT ORIENTED PROGRAMMING LABORATORY

L T P C

0 0 3 2

OBJECTIVES

- To implement the basic concepts of C++.
- To implement the polymorphism and template concepts.
- To implement the file operations.

List of Experiments:

1. Write a program to perform a student's internal mark calculation.
2. Write a program to calculate the area of circle, rectangle and triangle using function overloading
3. Write a class Square which has a field for side. It must have a constructor to initialize the side. Add methods to the Square class to calculate area and perimeter.
4. Write a class Circle which has a field for radius. It must have a constructor to initialize the radius. Add methods to the Circle class to calculate area and perimeter.
5. Write a class CheckoutCalculator which behaves somewhat like the machine at the checkout counter in supermarkets. This calculator should ask for the number of items for which the total is to be calculated and then allow you to enter the price for every item. After entering all the items it displays all the prices entered and the total amount. (Hint: Here you need to use dynamic memory allocation since you do not know how many items will be there. Use an array to store the prices of items)
6. Write a class Results which stores all the results in an array. Assume that we need to store only the results of a single semester which is four results. Each result will be final marks for a course between 0-100 and is stored in an integer array. Use dynamic memory allocation and the four methods mentioned above. Add separate methods to calculate the total marks for all courses and the average marks. Add a field for student ID.
7. Modify the Circle class which you have written earlier to overload the + operator so that you can add two Circle objects. Adding two Circle object should give another Circle whose radius is the sum of the radius of the two Circle objects.
8. Modify the Rectangle class which you have written earlier to overload the + operator so that you can add two Rectangle objects. Adding two Rectangle objects should give another Rectangle object whose length is the sum of the lengths of the two Rectangle objects and whose breadth is the sum of the breadths of the two Rectangle objects.
9. Write a class Time which represents time. The class should have three fields for hours, minutes and seconds. It should have constructor to initialize the hours, minutes and seconds. A method printTime() to print the current time. Overload the following operators: plus operator (+) (add two time objects based on 24 hour clock) and < (compare two time objects)
10. Modify the Rectangle class which you have written earlier to overload the < (less than) operator so that you can compare two Rectangles as to which is bigger (or smaller). The logic you will use is to compare the areas of the Rectangle objects and decide which is bigger.

11. Modify the Circle class which you have written earlier to overload the > (greater than) operator so that you can compare two Circles as to which is bigger (or smaller). The logic you will use is to compare the radii of the Circle objects and decide which is bigger.
12. Write a program to perform Stack and Queue operations using template.
13. Write a function calculateAverage() which takes four int arguments which are marks for four courses in the semester and returns their average as a float. The calculateAverage() function should take only valid range for marks which is between 0 - 100. If the marks are out of range throw an OutOfRangeException - define this exception as a class.
14. Write a program to perform a bank management system using file.

Required Software: C++

MCC27 SYSTEM PROGRAMMING LABORATORY

**L T P C
0 0 3 2**

OBJECTIVES

- To develop and analyze the data structures needed for developing an assembler, loader and linker.
 - To perform file handling using file manipulation system calls
 - To implement process management
 - To implement IPC techniques
 - To analyze scheduling algorithms and demonstrate page replacement policies
1. Write a C program to create symbol table and intermediate file using the algorithm for pass1 of the two pass assembler.
 2. Write a C program to create object file and list file with the output of the previous program using the algorithm for pass2 of the two pass assembler.
 3. Write a C program to implement the absolute loader.
 4. Write a C program to implement relocating loader.
 5. Write a C Program to implement the pass1 of the linking loader.
 6. Write a C program to implement the pass2 of the linking loader.
 7. Develop a text editor with features like insertion / deletion of a character, word, and sentence.
 8. Write a C program to perform file management tasks using file manipulation system calls in UNIX creat(), open(), read(), write(), close()
 9. Write a C program to create a new process using fork(). Make the child process to execute a new program using exec(). Terminate the execution of the child process using exit(). Make the parent to read the termination status of the child process using wait() / waitpid().
 10. Write a C program to implement IPC using pipe().
 11. Write a C program to implement IPC using message queue for unrelated process.
 12. Write a program to implement the following process scheduling algorithms
 - a. First Come First Serve
 - b. Shortest Remaining Job First (preemptive & non preemptive)
 - c. Round Robin
 - d. Priority Scheduling
 13. Write a program that demonstrates how two processes can share a variable using semaphore.
 14. Write a program to implement producer consumer problem using semaphore.
 15. Write a program to demonstrate page replacement policies like
 - a. Optimal
 - b. Least Recently Used (LRU)
 - c. First-In-First-Out

Required Software: LINUX & C

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Perform pixel-based processing to create simple geometric figures upon a screen.
- Implement transformations of graphical objects in two and three dimensions, project such objects from three to two dimensions and perform hidden-surface removal on faceted models.
- Understand the principles of color models and animation.
- Understand the use of fractal geometry and ray tracing to the problem of improving visual realism.
- Demonstrate practical competence in the use of graphics.

UNIT I INTRODUCTION 9

I/O devices – I/O primitives – Attributes of output primitives – DDA – Bresenham technique – Circle drawing algorithms – Interactive input methods.

UNIT II 2D GRAPHICS 9

2D Transformations – Clipping – Window – View Port Mapping – Graphical User Interfaces and Interactive Input Methods – Picture Construction Techniques – Virtual Reality Environment.

UNIT III 3D GRAPHICS 9

3D Transformation – 3D Viewing – Visible Surface Detection – Back Face Detection – Depth Buffer Method – Scan Line Method.

UNIT IV GRAPHICS PROGRAMMING 9

Color Models – RGB, YIQ, CMY, HSV – Animations – General Computer Animation, Key frame – Graphics programming using OpenGL – Basic graphics primitives – Drawing three dimensional objects – Drawing three dimensional scenes.

UNIT V FRACTALS 9

Fractals and Self similarity – Creating image by iterated functions – Mandelbrot sets – Random Fractals – Overview of Ray Tracing – Intersecting rays with other primitives – Adding Surface texture – Reflections and Transparency – Boolean operations on Objects.

TOTAL: 45 PERIODS

TEXT BOOKS

1. Donald D. Hearn, M. Pauline Baker, Warren Carithers, “Computer Graphics with Open GL”, 4th Edition, Prentice Hall, 2011.
2. Donald Hearn, Pauline Baker, “Computer Graphics – C Version”, 2nd Edition, Pearson Education, 2008 (7th Impression).
3. F.S. Hill, “Computer Graphics using OPENGL”, 3rd Edition, Pearson Education, 2007.

REFERENCES

1. Apurva.D.Desai, “Computer Graphics”, PHI learning Private Limited, 2008.
2. James D. Foley, Andries Van Dam, Steven K. Feiner, John F. Hughes, “Computer Graphics - Principles and Practice in C”, 2nd Edition, Pearson Education, 2007.

MCC34

COMPUTER NETWORKS

L T P C
3 0 0 3

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Analyze and solve the data transmission medium oriented numerical problems.
- Construct a network with different topologies.
- Analyze the difference between reliable and unreliable secure data delivery service.

UNIT I INTRODUCTION 9

Communication model – Data Communications – Data Transmission: analog and digital data transmission, Transmission impairments, channel capacity – Transmission media: Guided Transmission, Wireless Transmission, Wireless Propagation, Line-of-Sight Transmission – Data Link Control Protocols: Flow Control, Error Control, High-Level Data Link Control (HDLC).

UNIT II NETWORK FUNDAMENTALS 9

Need for protocol architecture – Reference models: OSI Reference Model, TCP/IP Reference Model, Comparison of the OSI and TCP/IP Reference Models – LAN Protocol Architecture: Topologies and Transmission media, Medium Access Control (MAC) and Logical Link Control (LLC) – Bridges: Functions of a Bridges, Bridge Protocol Architecture, Fixed Routing and Spanning Tree Approach.

UNIT III NETWORK LAYER 9

Circuit switching network – Packet-Switching Principles – X.25 – Routing Protocols: Characteristics, Routing Strategies, BGP and OSPF Protocol – Congestion control – Internet Protocol: IP Services, IPv4, IP Addresses, Subnets, ICMP, ARP and RARP.

UNIT IV TRANSPORT LAYER 9

Connection-Oriented Transport Protocol Mechanism: Reliable Sequencing Network Service, Unreliable Network Service – Transmission Control Protocol (TCP) – TCP Congestion Control: Additive Increase/Multiplicative Decrease, Slow Start and, Fast Retransmit and Fast Recovery – User Datagram Protocol (UDP).

UNIT V APPLICATIONS 9

Security: Requirements and Attacks, Message Authentication and Secure Hash Algorithm, RSA Public Key Encryption and Digital Signature – DNS – SNMP – Electronic mail: Architecture and Services, User agent, Message Format (MIME) and Message Transfer (SMTP, E-mail Gate way and Final Delivery) – World Wide Web (WWW): HTTP and URLs.

TOTAL: 45 PERIODS

TEXT BOOKS

1. William Stallings, “Data and Computer Communications”, 8th Edition, PHI, 2011.
2. Andrew S. Tanenbaum, David J. Wetherall, “Computer Networks”, 5th Edition, Pearson Education Inc., 2011.

REFERENCES

1. Larry L. Peterson and Bruce S. Davie, “Computer Networks – A Systems Approach”, 5th Edition, Harcourt Asia / Morgan Kaufmann, 2011.

MCC36

JAVA PROGRAMMING LABORATORY

L T P C

0 0 3 2

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Implement, compile, test and run Java program.
- Make use of hierarchy of Java classes to provide a solution to a given set of requirements found in the Java API.
- Understand the components and patterns that constitute a suitable development for GUI application and event handling.
- Demonstrate systematic knowledge of backend and front end by developing an appropriate application.

LIST OF EXPERIMENTS

1. Writing Java programs by making use of class, interface, package, etc for the following:
 - a. Simple programs using control structures
 - b. Stack / Queue implementation using Array.
 - c. Constructor
 - d. Method overloading
 - e. Types of inheritance
 - f. Overriding and interfaces
 - g. Creation of user specific packages
 - h. User specific exception handling
2. Write a java program to read the contents of a file and copy to destination file.
3. Write a java multithread program to synchronize the producer consumer problem using Inter Process Communication.
4. Design an applet program to create a color pallet using 5 radio buttons and one Choice box. Provide appropriate event handling to change the background color using radio button and change the foreground color by choice.
5. Design a banner Applet program to scroll the Text “Java programming Lab” using Thread.
6. Design an applet to implement Digital clock using Thread
7. Design an Applet program to create Email registration Form using different awt components. (Minimum 5 components). Write an event handling procedure to validate each field and display appropriate message.
8. Design an applet program to create a Calculator with Grid of Buttons. Write an event handling procedure to activate the buttons with required functionality. Make the contents of text field should not be editable.
9. Design a java GUI Frame to Manipulate the Student details in a database using JDBC. The frame contains the select, insert, delete buttons to do the database activity. The results of database queries are displayed into a Text Area component. The inputs to the queries are collected by using Input Dialog control. Write an event handling procedure to do the above work. Use MS Access to create a student database.
10. Design a Text Editor using java Frame class and the editor must support for creation of new file, open an exiting file and save the contents of Editor area using Menu components. Write an event handling procedure to accomplish the above task.
11. Write a java program to implement the Chat application using Sockets.
12. Write a Java GUI Application to display the content of web page using URL Class.

TOTAL: 45 PERIODS

Softwares Required: Java / Netbeans IDE

MCC37

CASE TOOLS LABORATORY

L T P C

0 0 3 2

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Analyze the functional requirements for a system
- Design, implement and test the programs that make appropriate use of advanced object-oriented facilities.

Mini-Project - I: A Point-of-Sale (POS) System

Develop a computerized application for recording sales and handling payments for a retail store.

Mini-Project - II: Online Bookshop Example

Develop a model like amazon.com or bn.com, design and implement an online bookstore.

Mini-Project - III: A Simulated Company

Simulate a small manufacturing company. The resulting application will enable the user to take out a loan, purchase a machine, and monthly production runs, follow the performance of the company.

Mini-Project - IV: A Multi-Threaded Airport Simulation

Simulate the operations in an airport. Your application should support multiple aircrafts using several runways and gates avoiding collisions/conflicts. Landing: an aircraft uses the runway, lands, and then taxis over to the terminal. Take-Off: an aircraft taxis to the runway and then takes off.

Mini-Project -V: An Automated Community Portal

Develop enterprise intranet portals for sharing information.

Mini-Project -VI: A Content Management System

The goal is to enable non-technical end users to easily publish, access, and share information over the web, while giving administrators and managers complete control over the presentation, style, security, and permissions.

Mini-Project-VII: An Auction Application

Design and implement an auction application that provides auctioning services. It should clearly model the various auctioneers, the bidding process, auctioning etc.

Mini-Project -VIII: A Notes and File Management System

Develop personal notes and documents.

Mini-Project - IX: A Customizable Program Editor

Develop an editor for user interaction.

Mini-Project - X: A Graphics Editor

Design and implement graph editing applications, i.e., applications that include the ability to draw structured and unstructured diagrams.

TOTAL: 45 PERIODS

Softwares Required: Agro UML, Visual paradigm UML, Visual basic, Java

MCC38

GRAPHICS LABORATORY

L T P C
0 0 3 2

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Create simple geometric figures upon a screen.
- Implement transformations of graphical objects in two and three dimensions.
- Employ clipping operations through various algorithms.
- Create image editing applications and animation.
- Apply the use of fractal geometry.

LIST OF EXPERIMENTS

1. Drawing Algorithms
 - a. Write a program to draw a line using DDA Algorithm
 - b. Write a program to draw a line using Bresenham Algorithm
 - c. Write a program to draw a circle using Bresenham Algorithm
 - d. Write a program to draw an ellipse using Bresenham Algorithm
2. 2D transformations
 - a. Draw a square object. Write a program in C for moving the object diagonally or turn the object clockwise by the user choices.
 - b. Draw a circle object. Write a program in C for moving an object vertically or enlarge the object by the user choices.
 - c. Draw a triangle object. Write a program in C for moving an object horizontally or turn the object counterclockwise by the user choices.
 - d. Draw an oval object. Write a program in C for enlarging an object or spin the object counterclockwise by the user choices.
 - e. Draw a polygon object. Write a program in C for shrinking an object or spin the object clockwise by the user choices.
 - f. Draw an ellipse object. Write a program in C for resizing or changing the position of the object.
3. 2D composite transformations
 - a. Draw a star object. Write a program in C for moving an object diagonally and rotating the object using composite transformation.
 - b. Draw a diamond object. Write a program in C for enlarging and rotating the object using composite transformation.
4. Reflection and Shear
 - a. Write a program in C for getting the mirror image of an object in X and Y direction
 - b. Write a program in C for changing the square to rhombus shape in X and Y direction.
5. Cohen Sutherland line clipping algorithm
 - a. Write a line clipping program in C which involves logical operations,
 - b. Write a line clipping program in C which has encoding operations.
6. Liang Barsky line clipping algorithm
 - a. Write a line clipping program in C which involves clip-test operation.
 - b. Write a line clipping program in C which has less multiplications and only one division.
7. Sutherland – Hodgeman Polygon clipping Algorithm

8. 3D transformations
 - a. Draw a cylinder object. Write a program in C for moving the object diagonally or turn the object clockwise by the user choices.
 - b. Draw a cube object. Write a program in C for moving an object vertically or enlarge the object by the user choices.
 - c. Draw a cone object. Write a program in C for moving an object horizontally or shrink the object by the user choices.
 - d. Draw a cube object. Write a program in C for rotating the object in X and Y direction.
 - e. Draw a hexagon object. Write a program in C for rotating the object in X or Z direction.
 - f. Draw a pyramid object. Write a program in C for rotating the object in Y or X direction
9. 3D composite transformations
 - a. Draw a cube object. Write a program in C for moving and resizing the object.
10. Create an application for image editing, enhancement, manipulation by using editing tools, layers, filters, special effects and color modes using photoshop.
 - a. Create an effect such that one image overlaps another.
 - b. Create a selective color change effect..
 - c. Type your name in caps. Apply an image into that.
 - d. Open a flower. Copy it and paste it four times. Give different colors to each
 - e. Open two people's images. Cut one's head and paste it into another
 - f. Design a greeting card atleast using 3 effects
 - g. Create a mirror image of an object
 - h. Print a watermark effect
 - i. Create an effect such that a baby's face smiling inside a flower
 - j. Adjust the features of a person's face
 - k. Open an Image, try to bring the effect of painting
 - l. Repaint the damaged images
 - m. Make an image glowing
 - n. Blur and sharpen an image.
 - o. Take a grayscale image. Change the color only in the face
11. Create an animation using Image Ready.
 - a. Two people walking from opposite side handshaking.
 - b. Changing colors of a rose
 - c. Printing our college name one letter by another
 - d. Rising a sun slowly from sea
 - e. Blinking of an eye of a child.
12. Fractal Images
 - a. Generating fractal images with self-similarity
 - b. Generating fractal images with iterated functions.

TOTAL: 45 PERIODS

Software Required: C, Photoshop, Image Ready.

MCC41

NETWORK PROGRAMMING

L T P C

3 0 0 3

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Develop client-server communication using TCP and UDP sockets.
- Develop iterative and concurrent server using TCP.
- Implement I/O multiplexing using select and poll functions.
- Implement concurrent server using threads.
- Develop connection less client-server communication using Java.

UNIT I ELEMENTARY TCP SOCKETS

9

Introduction to Socket Programming – Introduction to Sockets – Socket address Structures – Byte ordering functions – Address conversion functions – Elementary TCP Sockets – Socket, connect, bind, listen, accept, read, write, close functions – TCP Echo Server – TCP Echo Client.

UNIT II APPLICATION DEVELOPMENT

9

Process control – Posix Signal handling – Server with multiple clients – Iterative Server – Concurrent Server – Boundary conditions: Server process Crashes, Server host Crashes, Server Crashes and reboots, Server Shutdown – I/O multiplexing – I/O Models – Select function – Shut down function – TCP echo Server (with multiplexing) – Poll function – TCP echo Client (with Multiplexing).

UNIT III SOCKET OPTIONS, ELEMENTARY UDP SOCKETS

9

Socket options – getsockopt and setsockopt functions – generic socket options – IP socket options – ICMP socket options – TCP socket options – fcntl function – Elementary UDP sockets – UDP echo Server – UDP echo Client – Multiplexing TCP and UDP sockets – Domain name system – gethostbyname function – IPv6 support in DNS – gethostbyadr function – getservbyname and getservbyport functions.

UNIT IV ADVANCED SOCKETS

9

IPv4 and IPv6 interoperability – Threaded servers – thread creation and termination – TCP echo server using threads – Mutexes – Condition variables – raw sockets – raw socket creation – raw socket output – raw socket input – ping program – trace route program.

UNIT V NETWORK PROGRAMMING IN JAVA

9

Introduction to networked Java – Internet Addresses: InetAddress class, NetworkInterface class – Sockets for Clients – Sockets for Servers – UDP Datagrams and Sockets – Remote Method Invocation.

TOTAL: 45 PERIODS

TEXT BOOKS

1. W. Richard Stevens, Bill Fenner, Andrew M. Rudoff, “Unix Network Programming, Volume 1: The Sockets Networking API”, 3rd Edition, Addison-Wesley Professional, 2003.
2. Elliotte Rusty Harold, “Java Network Programming”, 3rd Edition, O'Reilly Media, 2004.

REFERENCES

1. W. Richard Stevens, “Advanced Programming in the UNIX Environment”, Addison Wesley, 1999.
2. Behrouz A.Forouzan, “TCP/IP Protocol Suite”, 4th Edition, Tata McGraw-Hill, 2010.

MCC42

WEB PROGRAMMING

L T P C
3 0 0 3

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Design and implement complete applications over the web using client and server side scripting languages.
- Interconnect clients and server using interconnectivity techniques.
- Retrieve data from a database and present it in a web page.
- Modify, add, and delete data in a database through a web page.

UNIT I INTRODUCTION 9

Client and Server concepts, Tiered architecture, WWW, IP Address, URL, URI, URN, Domain Name System, Internet protocols and applications: TCP, UDP, FTP, SMTP, POP, ICMP, SNMP; Types of Networks and applications, HTML.

UNIT II DYNAMIC HTML 9

Dynamic HTML – Introduction – Cascading style sheets – Z-Index – Visibility – Positioning – Object model and collections – Event model – Filters and transition – Data binding – Data control.

UNIT III SCRIPTS and APPLETS 9

JavaScript – Introduction – Control Structures – Functions – Arrays – Objects – Simple Web Applications – Applets – Life Cycle – Events – Layouts.

UNIT IV SERVLETS 9

Servlets – Deployment of simple servlets – Web server (Java web server / Tomcat / Web logic) – HTTP GET and POST requests – Session Tracking – Cookies – JDBC – Development of web applications.

UNIT V ASP and JSP 9

ASP basics – ASP objects – ASP applications – JSP Programming – JSP objects – Applications – PHP – MySQL.

TOTAL: 45 PERIODS

TEXT BOOKS

1. Deitel, Deitel and Nieto, “Internet and World Wide Web - How to program”, Pearson Education Publishers, 5th Edition, 2011.
2. Herbert Schildt, “The Complete Reference - Java2”, Tata McGraw-Hill, 8th Edition, 2011.

REFERENCES

1. Chris Bates, “Web Programming – Building Internet Applications”, Wiley India, 3rd Edition, 2006.
2. Krishnamoorthy R. & Prabhu S, “Internet and Java Programming”, New Age International Publishers, 1st Edition, 2004.
3. Thomas A. Powell, “The Complete Reference HTML and CSS”, 5th Edition, Tata McGraw Hill, 2010.
4. Jeffrey C Jackson, “Web Technology – A computer Science perspective”, Pearson Education, 2nd Edition, 2007.

MCC43

COMPILER DESIGN

L T P C
3 0 0 3

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Distinguish formal and practical properties of different approaches to parsing.
- Understand and implement various techniques to parse source code.
- Implement a basic compiler.
- Analyze the optimization technique on the intermediate representation.

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 Automata.

UNIT II SYNTAX ANALYSIS

9

Introduction – Context-free grammar and structure of language – Parser and its types – Top-down parser – Bottom-up parser – Implementation – Parser generator tool (Yacc) – Error handling.

UNIT III INTERMEDIATE CODE GENERATION

9

Introduction – Need for Intermediate code – Types of Intermediate code – Representation of all language constructs by three-address code – Grammar symbols and attributes – Semantic analysis – Semantic routines for intermediate code generation.

UNIT IV CODE OPTIMIZATION

9

Introduction – Hints on writing optimized code at user level – Construction of basic blocks and processing – Data-flow analysis using flow graph – Data-flow equations for blocks with backward flow control – Principal sources of optimization and transformations – Alias – Procedural optimization – Loops in flow graph – Loop optimization.

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 BOOK

1. K.Muneeswaran, “Compiler Design”, 1st Edition, Oxford University Press 2013.

REFERENCES

1. Alfred Aho, Monica S.Lam, Ravi Sethi and Jeffrey D.Ullman, “Compiler Principles, Techniques and Tools”, 2nd Edition, Addison Wesley 2007.
2. Steven S.Muchnick, “Advanced Compiler Design Implementation”, Morgan Kaufmann, 2009.

MCC44 NETWORK PROGRAMMING LABORATORY

L T P C

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Analyze and develop client/server communication using connection oriented and connection less protocols.
- Demonstrate domain name system.
- Competent with application development and debugging in Unix environments.
- Demonstrate remote method invocation and remote procedure call.

LIST OF EXPERIMENTS

1. Implement a client/server user-level application using TCP sockets in C. The Server application has to accept string from client and echo the received string. For example, when client sends “Welcome to Network programming Lab”, Server replies with “Welcome to Network programming Lab.
2. Implement a client/server user-level application using TCP sockets in C. The Server application has to support ‘n’ number of clients, but one by one. The Server application has to accept string from client and replies with received string. For example, when client sends “Iterative Sever”, Server replies with “Iterative server”.
3. Implement a client/server user-level application using TCP sockets in C. The Server application has to support ‘n’ number of clients simultaneously. The Server application has to accept string from client and replies with received string. For example, when client sends “concurrent sever”, Server replies with “concurrent server”.
4. Implement a client/server user-level application using TCP sockets in C. The Server application must be able to chat with ‘n’ number of clients simultaneously.
5. Implement a client/server user-level application using UDP sockets in C. The Server application must be able to chat with ‘n’ number of clients simultaneously.
6. Implement a client/server user-level application using UDP sockets in C. The Server application has to accept string from client and echo the received string. For example, when client sends “Welcome to Network programming Lab”, Server replies with “Welcome to Network programming Lab.
7. Implement a client/server user-level application using UDP sockets in C. The Server application has to support ‘n’ number of clients, but one by one. The Server application has to accept string from client and replies with received string. For example, when client sends “Iterative Sever”, Server replies with “Iterative server”.
8. Implement a client/server user-level application using UDP sockets in C. The Server application has to support ‘n’ number of clients simultaneously. The Server application has to accept string from client and replies with received string. For example, when client sends “concurrent sever”, Server replies with “concurrent server”.
9. Write a client/server program wherein the client sends the name of a command to be executed at the server. The server then sends the result back to the client. Implement the above using connection less service.

10. Write a client/server program wherein the client the name of a program to be executed at the server. The server then sends the result back to client. Implement the above using connection oriented service and concurrent server.
11. Write a client server program wherein the client when connects to the server, the server then sends the system data and time to the client. Implement the above using RMI.
12. Develop a client / server communication program in Java using connection less protocol.
13. Write a client / server program wherein the client sends the IP – address and the server responds by sending the corresponding host's name. Use connection less service to implement the above.
14. Write a client / server program wherein the client sends the name of a file and the server returns the contents of the file. Use connection oriented service to implement the above. Implement the server as an iterative server.
15. Write a client / server program wherein the client sends two numbers, the server finds its gcd and returns to the client. Use RPC to implement above.
16. Write client / server program wherein the client sends a Unix Command (like 'ls') and the server returns the result of execution of the command. Use RPC to implement the above.
17. Write a program to implement the following interaction between client and server. User supplies the filename to the client program. Client program in turn sends it to the server; the server reads the contents of a text file and then sends the contents to the client, then the client displays it on the screen. Implement with concurrent TCP server.

TOTAL: 45 PERIODS

Software Required: Unix, C and Java

MCC45

WEB PROGRAMMING LABORATORY

L T P C
0 0 3 2

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Design Web Pages using Client Side Scripting and DHTML.
- Implement server side languages like Servlets, JSP and ASP.
- Develop web services and E-business applications.

LIST OF EXPERIMENTS

1. Design of image mapping for an image using HTML. Link the documents using an image and mark the hot spots in the image.
2. Development of web page using cascading Style Sheets (CSS) and implement its types.
3. Create a registration form and do the validation using HTML and Java Script.
4. Design of color palette using java and change the background and foreground of web pages.
5. Implement the types of layouts for different application and develop a simple calculator using grid layout.
6. Design and develop an application using servlets and interconnect client and server.
7. Invoke HTML form using servlets and create interactivity.
8. Develop a real time application using applets.
9. Implement an Employee payroll processing application using ASP and connect client and server.
10. Develop an Online examination using JSP and display the marks.
11. Implement a web system using JDBC and interconnect client and server using servlets.
12. Design an online shopping web page using JSP and design an interactive online shopping web site.

TOTAL: 45 PERIODS

Software Required: Java, XML, HTML, Scripting languages, ASP, JSP, Servlets.

MCC46

COMPILER DESIGN LABORATORY

L T P C
0 0 3 2

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Understand the language translation peculiarities by designing complete translator for mini language.
- Understand the design aspect of various phases of compiler.

LIST OF EXPERIMENTS

1. Implement a lexical analyzer in “C”.
2. Use LEX tool to implement a lexical analyzer.
3. Write a C Program to convert a grammar into finite automata
4. Write a C Program to convert a Regular expression into finite automata
5. Implement a recursive descent parser for an expression grammar that generates arithmetic expressions with digits, + and *.
6. Implement LL (1) parser using C Program.
7. Write semantic rules to the YACC program in problem 5 and implement a calculator that takes an expression with digits, + and * and prints its value.
8. Implement the front end of a compiler that generates the three address code for a simple language with: one data type integer, arithmetic operators, relational operators, variable declaration statement, one conditional construct, one iterative construct and assignment statement.
9. Implement the back end of the compiler which takes the three address code generated in problems 7 and 8, and produces the 8086 assembly language instructions that can be assembled and run using a 8086 assembler. The target assembly instructions can be simple move, add, sub, and jump.
10. Implement code optimization technique to improve the quality of the program.

TOTAL: 45 PERIODS

Software Required: TURBO C, LEX, YACC

MCE4B ELECTRONIC COMMERCE L T P C
3 0 0 3

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Explore basic Internet Transactions features
- Apply the Security Technologies in Electronic Commerce
- Acquire knowledge about the strategies to develop Electronic Commerce web sites and Payment Systems
- Acquire knowledge about the environment of Electronic commerce , Techniques and Tools of Electronic Data Interchange

UNIT I INTRODUCTION 6

Networks and Commercial Transactions – Internet and Other Novelties – Electronic Transactions – Commercial Transactions – Establishing Trust – Internet Environment – Internet Advantage – E-Commerce Infrastructure – Internet, Web and Mobile Platforms.

UNIT II SECURITY TECHNOLOGIES 9

Unsecured Internet – Internet Security Holes – Cryptography: Objective – Codes and Ciphers – Breaking Encryption Schemes – Data Encryption Standard – Trusted Key Distribution and Verification – Cryptographic Applications – Encryption – Digital Signature – Non repudiation and Message Integrity.

UNIT III ELECTRONIC PAYMENT METHODS 9

Planning electronic commerce initiatives – Strategies for developing electronic commerce web sites – Managing electronic commerce implementations – Traditional Transactions : Updating – Offline and Online Transactions – Secure Web Servers – Required Facilities – Digital Currencies and Payment Systems – Protocols for the Public Transport – Security Protocols – SET – Credit Card Business Basics.

UNIT IV ELECTRONIC COMMERCE PROVIDERS 9

Online Commerce Options – Functions and Features – Payment Systems: Electronic, Digital and Virtual Internet Payment System – Account Setup and Costs – Virtual Transaction Process – Info Haus – Security Considerations – Cyber Cash: Model – Security – Customer Protection – Client Application – Selling through Cyber Cash.

UNIT V ONLINE COMMERCE ENVIRONMENTS 12

Environment of electronic commerce – Legal, Ethical and Tax issues – Commercial Environments – Payment Methods – Server Market Orientation – Netscape Commerce Server – Microsoft Internet Servers – Digital Currencies – DigiCash – Using Ecash – Ecash Client Software and Implementation – Smart Cards – The Chip – Electronic Data Interchange – Internet Strategies, Techniques and Tools.

TOTAL: 45 PERIODS

TEXT BOOK

1. Pete Loshin, “Electronic Commerce”, 4th Edition, Firewall media, An imprint of laxmi publications Pvt. Ltd., New Delhi, 2004.

REFERENCES

1. Gary P. Schneider, “Electronic Commerce”, 8th Edition, Cengage Learning, 2008.
2. Jeffrey F.Rayport and Bernard J. Jaworski, “Introduction to E-Commerce”, 2nd Edition, Tata McGraw Hill Private Limited., 2006.
3. Greenstein, “Electronic Commerce”, Tata McGraw Hill Private Limited, 2004.

MCE4C

INFORMATION SYSTEMS

L T P C
3 0 0 3

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Identify and analyze Information System Management and requirements in Decision Making
- Communicate to both business and IT professionals
- Implement practical applications of Information Systems in Business and Society

UNIT I INFORMATION SYSTEM AND ORGANIZATION 9

Organizations and Information Systems – Types of Information Systems – Challenges of Information Systems – The Role of Information Systems in Business Today – Impact of Information Systems on Organizations – Ethical and Social Issues related to information Systems

UNIT II INFORMATION TECHNOLOGY INFRASTRUCTURE 9

IT Infrastructure – Components Hardware Platform Trends – Contemporary Software Platform Trends – Organizing data in Traditional File Environment and its Problems – Groupware, Team ware, and Electronic Conferencing – Supply Chain Management Systems

UNIT III INFORMATION SYSTEMS AND DECISION MAKING 9

Decision Making and Decision Support Systems – Systems for Decision Support – Group Decision Support Systems – Enterprise Systems – Securing Information Systems – Mobile Digital Platform and Mobile E-Commerce

UNIT IV SYSTEM DEVELOPMENT APPROACHES 9

System Analysis and Design – System Development Life Cycle (SDLC) – Different SDLC Models and Technical challenges – Prototyping – End User Development – Building Information Systems – Managing Projects – Managing Global Systems

UNIT V INFORMATION SYSTEM DEVELOPMENT TOOLS AND APPLICATIONS 9

Computer-Aided System Engineering (CASE) Tools – Business – Accounting – Health – Academic and Social Services

TOTAL: 45 PERIODS

TEXT BOOKS

1. Kenneth C. Laudon and Jane P. Laudon, “Management Information Systems: Managing the Digital Firm”, 12th Edition, Prentice Hall, 2012.
2. James O’ Brien and George Maracas, “Management Information Systems”, 10th Edition, McGraw-Hill Higher Education, 2010.

REFERENCES

1. Laudon Kenneth C., Laudon Jane P., “Management Information Systems: Managing the Digital Firm”, 9th Edition, Prentice Hall, 2005.
2. Efraim Turban, R. Kelly Rainer, Richard E. Potter., “Introduction to Information Technology”, 3rd Edition, Wiley, 2004.

MCE4D

WEB GRAPHICS

L T P C
3 0 0 3

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Design the web sites and create images and animated pictures.
- Design logo, brochure and images.
- Develop animations, graphics and movies using Windows Media Player.

UNIT I INTRODUCTION 9

Basic web graphics – Web designing, Image maps – Pixels, Resolutions, Principles of Graphic design, Raster Graphics Vs Vector Graphics, Introduction to CorelDraw – Basic Drawing Skills – Using Text – Working with Objects – Adding Special Effects – Creating Output.

UNIT II RASTER IMAGE EDITING SOFTWARE 9

Introduction – Image Basics – File Formats – GIF – JPEG – Color Palette – Color models –Layers – Creating new Images – Brushes – Grids and Guides – Gradients – Scaling Images – Moving and Merging Layers – Tool Palette – Dialogs – Masking – Filters – Adding text to images – Designing icons and background images.

UNIT III VECTOR IMAGE HANDLING 9

Introduction – Creating Simple Vector graphics – Creating banners – Images – Working with layers – Tweening – Motion guide – Masking – Frame by Frame animation – Onion Skin Effect – Creating special effects – Text effects and animation – Action scripts.

UNIT IV MULTIMEDIA 9

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 9

Development of interactive web applications with a particular theme using vector graphics and raster graphics concepts – Animations and Interaction.

TOTAL: 45 PERIODS

TEXT BOOKS

1. Tavmjong Bah, Inkscape, “Guide to Vector Drawing Program”, 2nd Edition, 2011.
2. James L. Mohler, “Flash 5.0 Graphics, Animation & Interactivity”, Macromedia 2000.

REFERENCES

1. Adobe creative team, “Adobe Photoshop Elements 7 and Adobe Premiere Elements classroom in a book collection”, Adobe Press, 2009.
2. Richard Schrand, “Photoshop 6 Visual Jumpstrat”, Adobe Press 2001.
3. Adobe creative team, “Action Script 3.0 Adobe Flash CS4 professional classroom in a book”, Adobe Press, 2010.

MCE4E

ADVANCED DATABASES

L T P C

3 0 0 3

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Explain and evaluate the fundamental theories and requirements that influence the design of modern database systems.
- Assess and apply database functions and packages suitable for distributed database development.
- Critically evaluate alternative designs and architectures for databases and data warehouses.
- Analyze the background processes involved in queries and transactions, and explain how these impacts on spatial and temporal database operation and design.

UNIT I DATA WAREHOUSING 8

Introduction to Data warehousing – Multidimensional data model – Architecture – Types of Schemas – concept Hierarchies – OLAP operations – Indexing – OLAP queries & Tools.

UNIT II DISTRIBUTED DATABASES 9

Distributed Database Concepts – Distributed Data Storage – Distributed Transactions – Commit Protocols – Concurrency Control – Distributed Query Processing – Three Tier Client Server Architecture.

UNIT III OBJECT ORIENTED DATABASES 10

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.

UNIT IV SPATIAL AND TEMPORAL DATABASES 9

Spatial Databases: Introduction – Spatial representation – data types – relationships – access methods – Indexing – Temporal Databases: Motivation – Indexing – Snapshot Index – spatiotemporal databases.

UNIT V RESEARCH TRENDS 9

Mobile Databases – Semi structured database – Column store – Web database – Multimedia database – Data in the Cloud – Google File System.

TOTAL: 45 PERIODS

TEXT BOOKS

1. Henry F Korth, Abraham Silberschatz, S. Sudharshan, “Database System Concepts”, 6th Edition, McGraw Hill, 2010.
2. Jiawei Han, Micheline Kamber, “Data Mining: Concepts and Techniques”, 3rd Edition, Morgan Kaufmann Publishers, March 2011.

REFERENCES

1. R. Elmasri, S.B. Navathe, “Fundamentals of Database Systems”, 6th Edition, Pearson Education /Addison Wesley, 2010.
2. Thomas Cannolly and Carolyn Begg, “Database Systems, A Practical Approach to Design, Implementation and Management”, 5th Edition, Pearson Education, 2010.
3. Philippe Rigaux, Michel O. Scholl and Agnes Voisard, “Spatial Databases: with applications to GIS”, 2nd Edition, Morgan Kaufmann, 2002.
4. Serge Abiteboul, Peter Buneman, and Dan Suciu, “Data on the Web: From Relations to Semi structured Data and XML”, 2nd Edition, Morgan-Kaufmann Publishers, 2000.

MCE4H DISTRIBUTED SYSTEMS

L T P C
3 0 0 3

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Articulate relative advantages and drawbacks of the main types of formal models for a distributed system
- Describe algorithms and/or impossibility results for typical abstract problems in distributed computing and Operating system
- Identify appropriate complexity measures and analyze solutions to Fault tolerance in distributed environment

UNIT I COMMUNICATION IN DISTRIBUTED ENVIRONMENT 9

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

UNIT II DISTRIBUTED OPERATING SYSTEMS 11

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

UNIT III DISTRIBUTED RESOURCE MANAGEMENT 11

Distributed Shared Memory – Data-Centric Consistency Models – Client-Centric Consistency Models – Distributed Scheduling – Distributed File Systems – Sun Network File Systems.

UNIT IV FAULT TOLERANCE AND CONSENSUS 7

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

UNIT V CASE STUDIES 7

Ivy – Munin – CORBA – COM+ – Distributed Coordination – Based System – JINI.

TOTAL: 45 PERIODS

TEXT BOOK

1. George Coulouris, Jean Dollimore, Tim Kindberg, “Distributed Systems Concepts and Design”, 5th Edition, Pearson Education Asia, 2012.

REFERENCES

1. Hagit Attiya and Jennifer Welch, “Distributed Computing: Fundamentals, Simulations and Advanced Topics”, Wiley, 2004.
2. A.S.Tanenbaum, M.Van Steen, “Distributed Systems”, Pearson Education, 2004.
3. M.L.Liu, “Distributed Computing Principles and Applications”, Pearson / Addison Wesley, 2004.

MCE4J

UNIX INTERNALS

L T P C
3 0 0 3

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Work with UNIX shell and file system.
- Develop skills to experience common UNIX programming tools to create UNIX applications.
- Work with UNIX files, processes, signals, sockets, and various other SystemV constructs
- Implement memory allocation in response to specific requests, to manage and reclaim memory.

UNIT I UNIX SYSTEM STRUCTURES 9

Architecture of Unix Operating System – Introduction to system concepts – Kernel – Kernel data structures – Buffer Cache: Buffer Headers – Structure of Buffer Pool – Retrieval of Buffer – Advantages of buffer cache.

UNIT II INTERNAL REPRESENTATION OF FILES 9

Inode – Structure of a regular file – Directories – Conversion of a path names to an Inode – Superblock – Inode assignment to a file – Allocation of disk blocks – Other file types.

UNIT III SYSTEM CALLS FOR THE FILE SYSTEM 9

Open – Read – Write – File and Record locking – Lseek – Close – File creation – Creation of special files – Changing directory and root – Changing Owner and mode – Pipes – Mounting and unmounting file system – Link – Unlink – File system maintenance.

UNIT IV PROCESSES 9

Process states and transitions – Layout of system memory – Context of a process – Saving the context of the process – Manipulation of the process address space – Process Creation – Signals – Process termination – Invoking other programs – Changing the size of a process – System boot and init process – Process Scheduling – Sockets.

UNIT V MEMORY MANAGEMENT 9

Swapping – Application of swap space – File swap – Demand Paging – Data structures for demand paging – Swap process in and out – Page stealing – Page aging and page fault.

TOTAL: 45 PERIODS

TEXT BOOKS

1. Maurice J Bach, “The Design of the UNIX Operating Systems”, Prentice Hall of India, Pearson Education, 2012.
2. Uresh Vahalia, “UNIX Internals: The New Frontiers”, Prentice Hall of India, Pearson Education, 2008.

REFERENCE

1. Richard Stevens, “UNIX Network Programming”, Volume I, Prentice Hall of India, Pearson Education, 2010.

MCE4K

VISUAL PROGRAMMING

LT P C

3 0 0 3

COURSE OUTCOMES

On successful completion of the course, the students will be able to

- Develop Windows Application Programming Interface (API).
- Build well structured GUI programming using Microsoft Foundation Classes.
- Develop simple applications using Visual C++.
- Integrate the media content with the programming environment.

UNIT I WINDOWS PROGRAMMING

10

The windows programming model – A simple windows program – Message processing in windows programming – Creating and displaying the window – Message loop – The window procedure – Painting and repainting – Introduction to GDI – Device context – Child Window controls.

UNIT II VISUAL C++ PROGRAMMING FUNDAMENTALS

9

Application framework – Creating a simple program in VC++ – Visual C++ components - AppWizard – Class Wizard – Introduction to MFC – MFC library – Adding new classes and functions.

UNIT III DOCUMENT VIEW ARCHITECTURE

9

Introduction to API – Event handling – Mapping modes – Modal and modeless dialog – Menus – Single and Multiple document interface – Reading and Writing documents – Splitter window and multiple views.

UNIT IV CONTROLS

9

ActiveX and OLE controls – Installing ActiveX controls – OLE Drag and Drop – Component Object model – Dynamic controls – Windows common controls.

UNIT V ADVANCED CONCEPTS

8

Database management with Microsoft ODBC – Sample database applications – Dynamic Linking Library – VC++ networking issues – Winsock and WinInet – Building a web client – Information server.

TOTAL: 45 PERIODS

TEXT BOOKS

1. Charles Petzold, “Programming Windows”, 6th Edition, Microsoft Press, 2012.
2. Ivor Horton’s, “Beginning Visual C++”, John Wiley Sons, 2010.

REFERENCES

1. David J. Kruglinski, George Shepherd and Scot Wingo, “Programming Visual C++”, Microsoft Press, 5th Edition, 2012.
2. Pappas & Murray, “The Complete Reference - Visual C++”, McGrawHill, 2011.

MCC51 .NET PROGRAMMING AND SCRIPTS L T P C
3 0 0 3

COURSE OUTCOMES

Upon successful completion of this course, the students will be able to

- CO 1: Acquire knowledge about .NET standards and its functionalities.
- CO 2: Apply the detailed concepts of ADO.NET to implement backend connection.
- CO 3: Able to understand the controls that constitute a suitable architecture for a web application using ASP.NET and VB.NET.
- CO 4: Explore the MVC concept of ASP.NET and create interactive web pages.

UNIT I CLR AND .NET FRAMEWORK 9

.NET overview: .NET Platform- .NET Framework Design Goals – The Common Language Run Time (CLR) – CLR Environment – Meta Data – Assemblies – Reflection – Multi Threaded Programming – Thread Synchronization.

UNIT II VB.NET 9

Fundamentals – Development Environment – Elements – Classes – Interfaces – Exception Handling – Data Processing and I/O – Interfacing with End User: Windows Programming, Menus and Dialog boxes – Debugging with VB.NET.

UNIT III ADO .NET 9

Fundamentals – ADO.NET – Connection Oriented Architecture – Data Adapter – Connectionless – Datasets – Typed – Untyped – Transactions and locks – Concurrency – Data source controls – Data binding – Data grid.

UNIT IV ASP.NET 9

Web server concepts – ASP .NET Page – Page Directive – Code Behind – ASP .NET Controls –HTML Controls – Validation Controls – Data Binding – Repeater – Data Grid – Web Configuration File – Request Response Objects – Session Management – Cookies – URL Rewriting.

UNIT V ASP.NET MVC 9

Introduction – Application – Folders – Layout – Controllers – Views – Database – Models – Security.

TOTAL: 45 PERIODS

TEXT BOOKS

1. Hoan Lam ,Thuan L.Thai, “.Net Framework Essentials,” 2nd Edition, O ‘Reilly Media 2002.
2. John Galloway, Phil Haack, Brad Wilson, “Professional ASP.NET MVC 3,” John Wiley & Sons, 2011.
3. Matt.J.Crouch, “ASP.NET and VB.NET Web Programming”, 1st Edition, 2002.
4. Jeffrey.R.Shapiro, “Visual Basic.Net: The Complete Reference,” 1st Edition, McGraw-Hill Education India Private Limited, 2002.
5. Matthew MacDonald, “ASP.NET: The Complete Reference,” 1st Edition, McGraw-Hill Education India Private Limited, 2002.

REFERENCES

1. C. Stephen Perry, Stephen Walther, Atul Kahate , Joseph Mayo, “Essentials of .Net Related Technologies: With a focus on C# , XML, ASP .NET and ADO .NET,” 1st Edition, Pearson Education.
2. Andrew Troelsen, “C# with .NET 3.0,” Special Edition, APress, 2007.
3. Matt Telles, Kogent Solutions Inc. Telles, “C# 2005 Programming, Black book”, Dreamtech Press, 2007.
4. Deitel and Deitel “Internet and World Wide Web – How to program,” 4th Edition, Prentice Hall, 2007.

MCC52

XML AND WEB SERVICES

L T P C

3 0 0 3

COURSE OUTCOMES

Upon successful completion of this course, the students will able to

- CO 1: Develop the XML documents and its DTD.
- CO 2: Validate the XML file against schema and Transform XML into XHTML.
- CO 3: Develop Web Services using .Net.
- CO 4: Program SOAP and apply it in E-Commerce.
- CO 5: Analyze the security concepts in XML.

UNIT I INTRODUCTION 9

Role of XML – XML and the Web – XML Language Basics – Comparison with HTML – XML Documents – Well-Formed XML Document – XML Elements – Types of Elements – Attributes – Elements Vs Attributes – DTD.

UNIT II XML TECHNOLOGY 9

XML – XML Schemas – Validating XML documents using XML Schema – Name Spaces – Structuring with Schemas – Presentation Techniques – Transformation Techniques.

UNIT III WEB SERVICES 9

Overview – Architecture – Key Technologies – UDDI – WSDL – ebXML – SOAP and Web Services in E-Commerce – Overview of .NET and J2EE.

UNIT IV SOAP 9

Overview of SOAP – HTTP – XML – RPC – Message Structure – Intermediaries – Actors – Design Patterns and Faults – SOAP With Attachments – SOAP and Web Services in E-Commerce.

UNIT V XML SECURITY 9

Security Overview – Canonicalization – XML Security Framework – XML Encryption – XML Digital Signature – XKMS Structure – Guidelines for Signing XML Documents – XML in Practice.

TOTAL: 45 PERIODS

TEXT BOOKS

1. Frank. P. Coyle, XML, Web Services And The Data Revolution, Pearson Education, 1st Edition, 2002.
2. Ron Schmalzer, Travis Vandersypen, Jason Bloomberg, et al, “XML and Web Services Unleashed”, 2nd Edition, Pearson Education, 2008.

REFERENCES

1. Deborah Nolan, Duncan Temple Lang, “XML and Web Technologies for Data Sciences with R,” Springer Publications, 2014.
2. Ramesh Nagappan , Robert Skoczylas and Rima Patel Sriganesh, “Developing Java Web Services”, Wiley Technology Publishing, 2nd Edition, 2004.
3. Sandeep Chatterjee, James Webber, “Developing Enterprise Web Services”, Prentice Hall Professional, 1st Edition, 2004.
4. James McGovern, Sameer Tyagi, Michael Stevens, Sunil Mathew, “Java Web Services Architecture”, Morgan Kaufmann Publishers, 2nd Edition, 2005.

MCC53

XML AND WEB SERVICES LABORATORY

L T P C
0 0 3 2

COURSE OUTCOMES

Upon successful completion of this course, the students will able to

- CO 1: Develop the XML and its DTD and verify the structure of XML document.
- CO 2: Validate XML file.
- CO 3: Convert XML file into XHTML file for further processing.
- CO 4: Extract XML elements and query the XML file.
- CO 5: Develop Web Services and convert web application into Web Service.

List of Experiments:

1. Create an XML document for employee information and store employee details and display in table form using Cascading Style Sheets.
2. Create an XML document to store information about books and create its corresponding DTD file.
3. Create an XML schema for the book's XML document from exercise 2.
4. Develop XML document for Online Library and present it using XSL.
5. Develop a program for validating XML document for any real time application.
6. Write an XSLT program to extract book titles, authors, publications, book rating from the book's XML document and use formatting.
7. Implement XSLT filters using Transformation technologies for CD catalog application.
8. Implement Xquery and XPATH for a real time application.
9. Use Microsoft DOM to navigate and extract information from the book's XML document.

10. Use Microsoft DSO to connect HTML form or VB form to the book's XML document and display the information.
11. Create a web service for temperature conversion using .NET.
12. Create a web service for currency conversion (five currencies) with appropriate client program.

TOTAL: 45 PERIODS

Software Required: .NET, Notepad++, XML Editor

MCC54

.NET PROGRAMMING LABORATORY

L T P C
0 0 3 2

COURSE OUTCOMES

Upon successful completion of this course, the students will be able to

- CO 1: Acquire knowledge about .NET environment.
- CO 2: Implement backend connection using ADO.NET.
- CO 3: Develop a web application using ASP.NET and VB.NET.
- CO 4: Create Interactive web pages using ASP.NET.

List of Experiments:

1. Create a website of a company using HTML.
2. Write a program to create a registration form using VBScript and validate it.
3. Implement a VB.NET program to display the Web Controls.
 - a. A List Box
 - b. A Button
 - c. An Image
 - d. A Label
 - e. A TextBox
4. Write a program for data encryption and decryption using VB.NET.
5. Design an application for a library management system using ADO.NET.
6. Design an application using VB.NET and connect with database.
 - a. Employee Detail Management.
 - b. Student Detail Management.
 - c. Dictionary creation.
7. Implement an ASP.NET Application to validate the form using controls.
 - a. Range Validation.
 - b. Required Field Validation.
 - c. Regular Expression Validation.
 - d. Custom Validation.
8. Write a program using ASP.NET.
 - a. Stock Market Exchange.
 - b. Online Quiz.
 - c. Hospital Management system.
9. Write a program to create a web application using ASP.NET with MVC.
10. Write a program to invoke .NET web service from Web form.

TOTAL: 45 PERIODS

Software Required: Visual Studio 2008.

MCE5B

DATA MINING AND DATA WAREHOUSING

L T P C

3 0 0 3

COURSE OUTCOMES

Upon successful completion of this course, the students will able to

- CO 1: Explore data warehousing and OLAP, and devise efficient and cost effective methods for maintaining Data warehousing.
- CO 2: Develop practical work of data mining techniques and design hypothesis based on the analysis to conceptualize a data mining solution to a practical problem.
- CO 3: Evaluate systematically supervised and unsupervised models and algorithms with respect to their accuracy.
- CO 4: Explore recent trends in data mining such as web mining, text, multimedia and spatial-temporal mining.

UNIT I DATA WAREHOUSING

9

An introduction – characteristics of a data warehouse – data marts – other aspects of data mart. Online analytical processing: introduction – OLTP & OLAP systems – data modelling – star schema for multidimensional view – data modelling – multifact star schema or snow flake schema – OLAP TOOLS – State of the market – OLAP TOOLS and the internet.

UNIT II DATA MINING

9

Data Mining Functionalities – Data Preprocessing – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation. 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 CLASSIFICATION AND PREDICTION

9

Issues Regarding Classification and Prediction – Classification by Decision Tree Introduction, Bayesian Classification – Rule Based Classification, Classification by Back propagation, Support Vector Machines – Associative Classification, Lazy Learners – Other Classification Methods, Prediction – Accuracy and Error Measures, Evaluating the Accuracy of a Classifier or Predictor – Ensemble Methods – Model Section.

UNIT IV CLUSTER ANALYSIS

9

Types of Data in Cluster Analysis – A Categorization of Major Clustering Methods, Partitioning Methods – Hierarchical methods – Density-Based Methods – Grid-Based Methods – Model, Based Clustering Methods – Clustering High-Dimensional Data – Constraint, Based Cluster Analysis – Outlier Analysis.

UNIT V MINING OBJECT, SPATIAL, MULTIMEDIA, TEXT AND WEB DATA

9

Multidimensional Analysis and Descriptive Mining of Complex Data Objects – Spatial Data Mining – Multimedia Data Mining – Text Mining – Mining the World Wide Web.

TOTAL: 45 PERIODS

TEXT BOOKS

1. Jiawei Han, Micheline Kamber, and Jian Pei, “Data Mining: Concepts and Techniques”, 3rd Edition, Morgan Kaufmann, 2011.
2. Jiawei Han and Micheline Kamber “Data Mining Concepts and Techniques”, 2nd Edition, Elsevier, Reprinted 2008.

REFERENCES

1. G. K. Gupta “Introduction to Data Mining with Case Studies”, Easter Economy Edition, Prentice Hall of India, 2006.
2. Alex Berson and Stephen J. Smith “Data Warehousing, Data Mining and OLAP”, Tata McGraw Hill Edition, 10th Reprint 2007.

MCE5C

COMPONENT BASED TECHNOLOGY

L T P C
3 0 0 3

COURSE OUTCOMES

Upon successful completion of this course, the students will be able to

- CO 1: Familiarize software components.
- CO 2: Understand java based component technologies.
- CO 3: Study the .NET and CORBA component technologies.
- CO 4: Study the component frameworks and development.

UNIT I INTRODUCTION 9

Software Components – objects – fundamental properties of Component technology – modules – interfaces – callbacks – directory services – component architecture – components and middleware.

UNIT II JAVA BASED COMPONENT TECHNOLOGIES 9

Threads – Java Beans – Events and connections – properties – introspection – JAR files – reflection – object serialization – Enterprise Java Beans – Distributed Object models – RMI and RMI-IIOP.

UNIT III CORBA COMPONENT TECHNOLOGIES 9

Java and CORBA – Interface Definition language – Object Request Broker – system object model – portable object adapter – CORBA services – CORBA component model – containers – application server – model driven architecture.

UNIT IV .NET BASED COMPONENT TECHNOLOGIES 9

COM - Distributed COM – object reuse – interfaces and versioning – dispatch interfaces – connectable objects – OLE containers and servers – Active X controls – .NET components – assemblies – appdomains – contexts – reflection – remoting.

UNIT V COMPONENT FRAMEWORKS AND DEVELOPMENT 9

Connectors – contexts – EJB containers – CLR contexts and channels – Black Box component framework – directory objects – cross-development environment – component-oriented programming – Component design and implementation tools – testing tools – assembly tools.

TOTAL: 45 PERIODS

TEXT BOOK

1. Clemens Szyperski, "Component Software: Beyond Object-Oriented Programming", Pearson Education publishers, 2003.

REFERENCES

1. Ed Roman, "Mastering Enterprise Java Beans", John Wiley & Sons Inc., 2005.
2. Mowbray, "Inside CORBA", Pearson Education, 2003.
3. Freeze, "Visual Basic Development Guide for COM & COM+", BPB Publication, 2001.
4. Hortsamann, Cornell, "CORE JAVA Vol-II" Sun Press, 2002.

MCE5D

MANAGERIAL ECONOMICS

L T P C
3 0 0 3

COURSE OUTCOMES

Upon successful completion of this course, the students will be able to

- CO 1: Approach managerial decision problems using economic reasoning.
- CO 2: Analyze the production costs and set optimal prices for products.
- CO 3: Apply economic principles to decision making within a company and analyze long-term prospects for specific firms and markets.
- CO 4: Estimate demand, segment markets, use quality discrimination, and decide volume discounts.

UNIT I INTRODUCTION TO MANAGERIAL ECONOMICS 9

Managerial Economics Theory – Business decision making Model – Role of Profits – Managerial challenge – Demand Analysis – meaning, determinants and types of demand – Elasticity of demand – Demand function – cross elasticity of demand and curve analysis.

UNIT II FORECASTING, PRODUCTION AND COST ANALYSIS 9

Significance and selection of Forecasting Techniques – The production function – with one and Two variable inputs – determining Cost-Minimizing Production – Meaning and Measurement of Cost – Output relationship: long run and short run – Cobb-Douglas Production Function for Long-Run costs.

UNIT III MARKET STRUCTURE, PRICING AND OUTPUT DECISIONS 9

A Continuum of Market structure – Monopoly Defined – Oligopolistic Market Structure – Conceptual Framework for Proactive, Systematic-Analytical, Value-Based Pricing – Price Discrimination – Optimal Discriminating Price Levels – Pricing of Multiple Products – Pricing in Practice.

UNIT IV RISK AND UNCERTAINTY 9

The Nature and Frame work of Capital Expenditure Decision – The capital Budgeting Process – Estimating the Firm's Cost of Capital – Cost-Benefit analysis – Cost-Effectiveness Analysis Risk and Decision Analysis – Decision making under Uncertainty – Managing Risk and Uncertainty.

UNIT V MACROECONOMIC ISSUE 9

Choice of efficient Organizational Form – Licensing, Patents and Trade Secrets – Government Regulation – Market Structure, conduct and Performance – Command and Control Regulatory Constraints: A Economic Analysis – Governmental Protection of Business.

TOTAL: 45 PERIODS

TEXT BOOK

1. James R. McGuigan, R.Charlles Moyer and Frederick H.deB. Harris “Managerial Economics: Application, Strategy and Tactics”, CENGAGE Learning, India Publications, 2005

REFERENCES

1. G.S.Gupta , “ Managerial Economics”, Tata McGrawHill, 1990.
2. Joel Dean, “Managerial Economics”, Prentice Hall India. 1987..

MCE5F

DIGITAL IMAGING

L T P C

3 0 0 3

COURSE OUTCOMES

Upon successful completion of this course, the students will able to

- CO 1: Design and implement with Matlab algorithms for digital image processing operations such as histogram equalization, enhancement, filtering, and denoising.
- CO 2: Implement segmentation and compression for an image.
- CO 3: Apply image processing issues and techniques for real world problems.

UNIT I FUNDAMENTALS OF IMAGE PROCESSING 9

Elements of digital image processing systems, Elements of visual perception, brightness, contrast, hue, saturation – Color fundamentals and models – Image file formats – Image Acquisition – Sampling and Quantization – Pixel Relationships – Image operations, Morphological Image Processing.

UNIT II IMAGE ENHANCEMENT 9

Spatial Domain Gray level Transformations, Histogram Processing Spatial Filtering – Smoothing and Sharpening. Frequency Domain: Filtering in Frequency Domain – DFT, FFT, DCT, Smoothing and Sharpening filters – Homomorphic Filtering.

UNIT III IMAGE SEGMENTATION AND FEATURE ANALYSIS 9

Detection of Discontinuities – Edge Operators – Edge Linking and Boundary Detection, Thresholding – Region Based Segmentation – Morphological Watersheds, Motion Segmentation, Feature Analysis and Extraction.

UNIT IV MULTI RESOLUTION ANALYSIS AND COMPRESSIONS 9

Multi Resolution Analysis: Image Pyramids – Multi resolution expansion – Wavelet Transforms. Image Compression: Fundamentals – Models – Elements of Information Theory, Error Free Compression – Lossy Compression – Compression Standards.

UNIT V IMAGE REPRESENTATION AND RECOGNITION 9

Image Representation – Boundary Descriptors – Regional Descriptors – Relational Descriptors, Object Recognition – Applications of Image Processing – Video Motion Analysis – Image Fusion – Steganography – Digital Compositing,

TOTAL: 45 PERIODS

TEXT BOOKS

1. Rafael C.Gonzalez, Richard E.Woods, “Digital Image Processing”, 3rd Edition, Pearson Education, 2009.
2. S.Jayaraman, S.Esakkirajan and T.Veerakumar, “Digital Image Processing”, 1st Edition, Tata Mc Graw Hill, 2009.
3. Anil K. Jain, “Fundamentals of Digital Image Processing”, 2nd Edition, Pearson Education, 2003.

REFERENCES

1. Wilhelm Burger, Mark Burge, “Principles of Digital Image Processing: Fundamental Techniques”, 1st Edition, Springer, 2009.
2. Castleman, “Digital Image Processing”, 1st Edition Pearson Education, 2007.

MCE5G

ENTERPRISE RESOURCE PLANNING

L T P C
3 0 0 3

COURSE OUTCOMES

Upon successful completion of this course, the students will able to

- CO 1: Understand the Business Modules in ERP.
- CO 2: Study the different ERP Market.
- CO 3: Study the Future ERP.

UNIT I INTRODUCTION TO ERP 9

Overview – Benefits of ERP – ERP and Related Technologies – Business Process Reengineering – Data Warehousing – Data Mining – On-line Analytical Processing – Supply Chain Management.

UNIT II ERP IMPLEMENTATION 9

Implementation Life Cycle – Implementation Methodology – Hidden Costs – Organizing Implementation – Vendors, Consultants and Users – Contracts – Project Management and Monitoring.

UNIT III BUSINESS MODULES 9

Business Modules in an ERP Package – Finance – Manufacturing – Human Resource – Plant Maintenance – Materials Management – Quality Management – Sales and Distribution.

UNIT IV ERP MARKET 9

ERP Market Place – SAP AG – PeopleSoft – Baan Company – JD Edwards World Solutions Company – Oracle Corporation – QAD – System Software Associates.

UNIT V ERP – PRESENT AND FUTURE 9

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

TOTAL: 45 PERIODS

TEXT BOOK

1. Alexis Leon, “ERP Demystified”, Tata McGraw Hill, 2007.

REFERENCES

1. Hans Van Der Hoeven, “ ERP and Business Process “, Llumina Press, 2011
2. Joseph A. Brady, Ellen F. Monk, Bret J. Wangner, “Concepts in Enterprise Resource Planning”, Thomson Learning, 2001.
3. Vinod Kumar Garg and Venkitakrishnan N K, “Enterprise Resource Planning – Concepts and Practice”, PHI, New Delhi, 2003.
4. Jose Hernandez, Franklin Martinez and James Keogh, “SAP R/3 Handbook.

MCE5J

NATURAL LANGUAGE PROCESSING

LT P C

3 0 0 3

COURSE OUTCOMES

Upon successful completion of this course, the students will be able to

CO 1: Develop a language model using finite state automata and N-grams.

CO 2: Build a simple document indexer.

CO 3: Develop a binary classifier for a set of documents.

CO 4: Build a statistical analyzer for a given document.

UNIT I INTRODUCTION 9

Introduction – Knowledge of Language – Ambiguities – Models and Algorithms – Regular Expressions – Finite State Automata – Morphology and Finite-State Transducers – Dealing with Spelling Errors – Spelling Error Patterns – Detecting New-Word Errors – Probabilistic Model – Bayesian Model – Minimum Edit Distance.

UNIT II LANGUAGE MODELING AND PART-OF-SPEECH TAGGING 9

N-grams: Counting Words in Corpora - Simple N-grams – Smoothing – Backoff – N-grams for Spelling – Context-Sensitive Spelling Error Correction – Entropy. POS Tagging: English Word Classes – Tagsets for Spelling – POS Tagging – Rule Based POS Tagging – Stochastic POS Tagging – Transformation-Based Tagging.

UNIT III CONTEXT-FREE GRAMMARS AND PARSING 9

Constituency – Context-Free Rules and Trees – Sentence Level Construction – The Noun Phrase – Coordination – Agreement – The Verb Phrase and Sub-categorization – Auxiliaries – Parsing: Introduction – Top-Down Parser – Problems with Top-Down Parser – Feature Structures – Unification of Feature Structures – Probabilistic Context-Free Grammar.

UNIT IV MEANING AND TEXT MINING 9

Representing Meaning – Meaning Structure of Language – First Order Predicate Calculus – Representing Linguistically Relevant Concepts – Syntax-Driven Semantic Analysis – Word Sense Disambiguation – Text Categorization: Decision Trees – Maximum Entropy Modeling – Perceptrons – k-Nearest Neighbour Classification. Clustering: Hierarchical Clustering – Non- Hierarchical Clustering.

UNIT V APPLICATIONS 9

Machine Translation – Transfer Metaphor – Interlingua and Statistical Approaches – Discourse Processing – Dialog and Conversational Agents – Natural Language Generation – Surface Realization and Discourse Planning – Information Retrieval.

TOTAL: 45 PERIODS

TEXT BOOKS

1. Daniel Jurafsky and James H. Martin “Speech and Language Processing an Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition”, 2nd Edition, 2009.
2. Christopher D. Manning and Hinrich Schiitze, “Foundations of Statistical Natural Language Processing”, The MIT Press Cambridge, Massachusetts London, England.

REFERENCES

1. James Allen “Natural Language Understanding “, Benjamin/ Cummings Publishing Co. 1995.
2. Tomek Strzalkowski “Natural Language Information Retrieval”, Kluwer academic Publishers, 1999.
3. Stephen Marsland, “Machine Learning: An Algorithmic Perspective”, 2nd Edition, CRC Press, 2009.

MCE5K SOFTWARE AGENTS LT P C
3 0 0 3

COURSE OUTCOMES

Upon successful completion of this course, the students will able to

CO 1: Describe the basic concept techniques and applications of software agents.

CO 2: Design agent based application in java.

CO 3: Apply knowledge for security contemplation in agent.

UNIT I INTRODUCTION 9

Agent Definition – Agent Programming Paradigms – Agent Vs Object – Aglet – Mobile Agents – Agent Frameworks – Agent Reasoning.

UNIT II JAVA AGENTS 9

Processes – Threads – Daemons – Components – Java Beans – ActiveX – Sockets – RPCs – Distributed Computing – Aglets Programming – Jini Architecture – Actors and Agents – Typed and proactive messages.

UNIT III MULTIAGENT SYSTEMS 9

Interaction between agents – Reactive Agents – Cognitive Agents – Interaction protocols– Agent coordination – Agent negotiation – Agent Cooperation – Agent Organization – Self-Interested agents in Electronic Commerce Applications.

UNIT IV INTELLIGENT SOFTWARE AGENTS 9

Interface Agents – Agent Communication Languages – Agent Knowledge Representation – Agent Adaptability – Belief Desire Intension – Mobile Agent Applications.

UNIT V AGENTS AND SECURITY 9

Agent Security Issues – Mobile Agents Security – Protecting Agents against Malicious Hosts – Untrusted Agent – Black Box Security – Authentication for agents – Security issues for Aglets.

TOTAL: 45 PERIODS

TEXT BOOK

1. Joseph P. Bigus and Jennifer Bigus, “Constructing Intelligent agents with Java: Professional Developer's Guide”, 2nd Edition, John Wiley & Sons Inc, 2001.

REFERENCES

1. Stuart Russell and Peter Norvig, “Artificial Intelligence - A Modern Approach”, 3rd Edition, Prentice Hall, 2010.
2. Jeffrey M. Bradshaw, “Software Agents”, MIT Press, 2000.
3. Richard Murch, Tony Johnson, “Intelligent Software Agents”, 2nd Edition, Prentice Hall, 2000.
4. Gerhard Weiss, “Multi Agent Systems – A Modern Approach to Distributed Artificial Intelligence”, 2nd Edition, MIT Press, 2013.

MCE5M

HEALTHCARE FOR IT SERVICES

L T P C

3 0 0 3

COURSE OUTCOMES

On the successful completion of the course, the students will able to

- CO 1: Enrich and apply the knowledge of health care information in a real time system.
- CO 2: Use current technology and security principles in modern health care systems.
- CO 3: Meet IT challenges and initiate a management role of accessing health care information.

UNIT I INTRODUCTION 9

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

UNIT II HEALTH CARE INFORMATION SYSTEMS 9

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 9

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 9

Organizing information technology services – IT alignment and strategic planning – IT governance and management.

UNIT V IT INITIATIVES 9

Management's role in major IT initiatives – Assessing and achieving value in health care information systems.

TOTAL: 45 PERIODS

TEXT BOOK

1. Karen A Wager, Frances Wickham Lee, John P Glaser, “Managing Health Care Information Systems: A Practical Approach for Health Care Executives”, 2nd Edition, Wiley Publishers, 2010.

REFERENCES

1. Rudi Van De Velde and Patrice Degoulet, “Clinical Information Systems: A Component based approach”, Springer 2009.
2. Kevin Beaver, “Health Care Information Systems”, 2nd Edition, Auerbach Publishers, 2006.

MCE5N

PORTFOLIO MANAGEMENT

L T P C
3 0 0 3

COURSE OUTCOMES

Upon successful completion of this course, the students will be able to

- CO 1: Evaluate the characteristics of different financial assets such as money market instruments, bonds, and stocks, and how to buy and sell these assets in financial markets.
- CO 2: Provide a general overview of capital markets, financial instruments, and investment process.
- CO 3: Understand how financial markets work, to analyze securities, and to make intelligent investment decisions based on available evidence and analysis.
- CO 4: Analyze financial articles and news with a critical approach.
- CO 5: Know how to apply different valuation models to evaluate fixed income securities, stocks, and how to use different derivative securities to manage their investment risks.

UNIT I MONEY AND CAPITAL MARKETS 9

Trends of savings and financial flow – Characteristics and Need of The Indian Money Market – Major segments of Money Market – Capital Market – Introduction – Primary market and Secondary market – Recent capital market reforms – New Capital Issue – Instruments and Market Participant.

UNIT II STOCK EXCHANGES 9

Nature and Functions of Stock Exchange in India – Organizational Structure of the Secondary Market – Stock Exchanges and Financial Development in India – Listing of Securities in Stock Exchange – OTCEI Market – New Issue Market – Concepts and Function Underwriting – Role of new Issue Market – Mechanics of Trading in Stock Exchanges.

UNIT III FUNDAMENTAL ANALYSIS 9

Economic Analysis – Economic Forecasting and Stock Investment Decisions – Forecasting Techniques – Industry Analysis – Industry Classifications – Economy and Industry Analysis – Industry Life Cycle – Evaluating Industry Relevant Factors – External Industry Information Sources – Company Analysis: Measuring Earnings – Forecasting Earnings – Applied Valuation Techniques – Graham and Dodds Investor Ratios.

UNIT IV TECHNICAL ANALYSIS 9

Technical Analysis: Fundamental Analysis Vs Technical Analysis – Charting Methods – Market Indicators. Trend – Trend Reversals – Patterns – Moving Average – Exponential Moving Average – Oscillators – ROC – Momentum – MACD – RSI – Stochastic Factors Influencing Share Prices – Forecasting Stock Prices – Efficient Market Theory – Risk and Returns.

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 BOOK

1. V.K.Bhalla, "Investment Management", S.Chand and Company Ltd, New Delhi, 2003.

REFERENCES

1. Punithavathy Pandian, "Security Analysis and Portfolio Management", Vikas Publishing House Private Limited, 2001.
2. V.A.Avadhani, "Securities Analysis and Portfolio Management", Himalaya Publishing House, 1997.

MCE5P

ARTIFICIAL INTELLIGENCE

L T P C
3 0 0 3

COURSE OUTCOMES

On the successful completion of the course, the students will be able to

CO 1: Understand the modern view of AI as the study of agents and apply in real system.

CO 2: Use the searching techniques and build an ontology structure of a problem using knowledge engineering.

CO 3: Assess the techniques presented and apply them to real world problems.

UNIT I INTRODUCTION 9

Intelligent Agents – Agents and environments – Good behavior – The nature of environments – structure of agents – Problem solving agents – Example problems – searching for solutions – Uniformed search strategies – avoiding repeated states – searching with partial information.

UNIT II SEARCHING TECHNIQUES 9

Informed search strategies – heuristic function – local 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.

UNIT III KNOWLEDGE REPRESENTATION 9

Syntax and semantics of First-Order Logic – Using First-Order Logic – Propositional versus First-Order Inference – unification and lifting – forward chaining – backward chaining. Ontological Engineering – Categories and objects – Actions, simulations and events – Mental events and mental objects.

UNIT IV LEARNING 9

Forms of learning – Inductive learning – Learning decision trees – Ensemble learning – A Logical formulation of learning – Knowledge learning – Explanation based learning – Learning using relevant information – Inductive logic programming.

UNIT V APPLICATIONS 9

Communication as action – A Formal grammar for a fragment of English – Syntactic analysis – Augmented grammars – Semantic interpretation – Ambiguity and disambiguation – Discourse understanding – Grammar induction – Probabilistic language models – Information retrieval – Information Extraction – Machine translation.

TOTAL: 45 PERIODS

TEXT BOOK

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

REFERENCES

1. Nils J. Nilsson, “Artificial Intelligence: A new Synthesis”, 2nd Edition, Harcourt Asia Private Limited, 2000.
2. Elaine Rich and Kevin Knight, “Artificial Intelligence”, 2nd Edition, Tata McGraw Hill, 2003.
3. George F. Luger, “Artificial Intelligence-Structures and Strategies for Complex Problem Solving”, 3rd Edition, Pearson Education, 2002

MCE5R

SOFT COMPUTING

L T P C

3 0 0 3

COURSE OUTCOMES

Upon successful completion of this course, the students will be able to

- CO 1: Familiarize soft computing constituents.
- CO 2: Understand the fuzzy logic.
- CO 3: Study the different classifications of neural networks.
- CO 4: Study the applications of Genetic algorithms.

UNIT I SOFTCOMPUTING AND CONVENTIONAL AI 9

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

UNIT II FUZZY SYSTEMS 9

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

UNIT III ARTIFICIAL NEURAL NETWORKS 9

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

UNIT IV NEURO - FUZZY MODELING 9

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

UNIT V GENETIC ALGORITHMS 9

Introduction to Optimization – Genetic Algorithms: Binary and Continuous – Applications of Genetic Algorithms – Simulated Annealing – Particle Swarm Optimization – Ant Colony Optimization – Genetic Programming.

TOTAL: 45 PERIODS

TEXT BOOK

1. Jyh-Shing Roger Jang, Chuen-Tsai Sun, Eiji Mizutani, “Neuro-Fuzzy and Soft Computing”, Prentice-Hall of India, 2003.

REFERENCES

1. James A. Freeman and David M. Skapura, “Neural Networks Algorithms, Applications, and Programming Techniques”, Pearson Edn., 2003.
2. S. N. Sivanandam, S. Sumathi and S. N. Deepa, “Introduction to Fuzzy Logic using MATLAB”, Springer, 2007.
3. S.N.Sivanandam, S.N.Deepa, “ Introduction to Genetic Algorithms”, Springer, 2007.
4. Jacek M. Zurada, “Introduction to Artificial Neural Systems”, PWS Publishers, 1992.

MCE55

SOFTWARE PROJECT MANAGEMENT

L T P C
3 0 0 3

COURSE OUTCOMES

Upon completion of this course, the students will able to

- CO 1: Manage the software project development process.
- CO 2: Monitor the entire software project development process.
- CO 3: Organize the team members and take in to the right direction.

UNIT I INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT 9

Project Definition – Contract Management – Activities Covered By Software Project Management – Overview of Project Planning – Stepwise Project Planning.

UNIT II PROJECT EVALUATION 9

Strategic Assessment – Technical Assessment – Cost Benefit Analysis – Cash Flow Forecasting – Cost Benefit Evaluation Techniques – Risk Evaluation.

UNIT III ACTIVITY PLANNING 9

Objectives – Project Schedule – Sequencing and Scheduling Activities – Network Planning Models – Forward Pass – Backward Pass – Activity Float – Shortening Project Duration – Activity on Arrow Networks – Risk Management – Nature of Risk – Types of Risk – Managing Risk – Hazard identification – Hazard Analysis – Risk Planning and Control.

UNIT IV MONITORING AND CONTROL 9

Creating Framework – Collecting The Data – Visualizing Progress – Cost Monitoring – Earned Value – Prioritizing Monitoring – Getting Project Back To Target – Change Control – Managing contracts – Introduction – Types of contract – Stages in contract placement – Typical terms of a contract – contract management – Acceptance.

UNIT V MANAGING PEOPLE AND ORGANIZING TEAMS 9

Introduction – Understanding Behaviour – Organizational Behaviour: A Background – Selecting the right person for the job – Instruction in the best methods – Motivation – The Oldman – Hackman Job Characteristics Model – Working in groups – Becoming a team – Decision making – Leadership – Organizational structures – Stress – Health and Safety – Case Studies.

TOTAL: 45 PERIODS

TEXT BOOK

1. Bob Hughes and MikeCotterell “Software Project Management”, 4th Edition, Tata McGraw Hill Edition, 2006.

REFERENCES

1. Ramesh, Gopalaswamy, "Managing Global Projects ", Tata McGraw Hill, 2003.
2. P.Jalote “Software Project Management in Practice”, Pearson Education, 2002.

MCE5W INFRASTRUCTURE ADMINISTRATION AND MANAGEMENT

L T P C
3 0 0 3

COURSE OUTCOMES

Upon successful completion of this course, the students will able to

- CO 1: Understand and utilize System Administration and ethics.
- CO 2: Understand Data base Administration using oracle.
- CO 3: Apply the Security Technologies in Network Environment.
- CO 4: Acquire knowledge about the Linux Environment.

UNIT I SYSTEM ADMINISTRATION AND ETHICS 9

Introduction – System Components – Host Management – User Management – Ethics in System Administration: The Law and Ethics – The Corporation’s rights versus User’s rights.

UNIT II DATABASE ADMINISTRATION 9

Data as a Corporate Asset – The Need for the Role of a Database in an Organization – Introduction of a Database: Special Considerations – The Evolution of the Database Administration Function – The Database Environment’s Human Component – Security – Database Administration Tools – Developing a Data Administration Strategy – The DBA at work: using Oracle.

UNIT III SYSTEM INFRASTRUCTURE DESIGN 9

Assigning IP Addresses – Naming Network Devices – Installing Wireless NICs – Measuring Wireless Signal Strength – Implementing Bluetooth – Implementing Ad Hoc Wireless Networking – Using an Analog Modem – Using a DSL Modem – Using a Router as a Frame Relay Switch – Simulating T1 CSU/DSUs.

UNIT IV NETWORK ADMINISTRATION 9

Creating Local User Accounts – Creating Local User Groups – Managing Access to Resources – Disabling Local User Accounts – Setting Password Restrictions – Mitigating the Ping of Death – Securing Links between Routers – Guarding against SYN Flood Attacks – Implementing File – Level Encryption – Establishing Data Encryption between Routers – Creating Data Backups – Running an Antivirus Scan – Running an Anti-Spyware Scan – Searching for Operating System Updates.

UNIT V LINUX FILE SYSTEM MANAGEMENT 9

File System Organizations and File Types – File System Configuration – Optimizing storage and Data access – Logical volume manager.

TOTAL: 45 PERIODS

TEXT BOOKS

1. Mark Burgess, “Principles of network and system administration”, John Wiley and Sons, 2004.
2. Peter Rob, Carlos Coronol, “Database Systems: Design, Implementation and Management”, 8th Edition, Cengage Learning India Private Limited, 2009.
3. Toby S. Kandier, “Network Administrator Street Smarts: A Real World Guide to CompTIA network + Skills”, Wiley Publishing Inc., 4th Edition, 2006.
4. Moshe Bar, “Linux File Systems”, McGraw Hill, 2001.

REFERENCES

1. William Von Hagen, “Linux File Systems”, Sams, 2002.
2. Craig S. Mullins, “Database Administration – The Complete Guide to Practices and Procedures”, Addison Wesley Professional, 1st Edition, 2002.
3. Thomas A. Limoncelli, Christina J.Hogan and Strata R.Chalup, “The Practice of System and Network Administration”, Pearson Education Inc., 2007.