

ANNA UNIVERSITY TIRUCHIRAPPALLI
Tiruchirappalli - 620 024

MASTER OF COMPUTER APPLICATIONS
Regulations 2007
Curriculum

SEMESTER I

S.No	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	CA5101	Computer Organization	3	0	0	100
2	CA5102	Problem Solving and Programming	3	1	0	100
3	CA5103	Business Processes	3	0	0	100
4	CA5104	Data Structures	3	1	0	100
5	CA5105	Accounting and Financial Management	3	1	0	100
Practical						
6	CA5106	Data Structures Laboratory	0	0	3	100
7	CA5107	Programming Laboratory	0	0	3	100

SEMESTER II

S.No	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	CA5151	Mathematical Foundations of Computer Science	3	1	0	100
2	CA5152	Object Oriented Programming	3	0	0	100
3	CA5153	Design and Analysis of Algorithms	3	1	0	100
4	CA5154	Database Management Systems	3	0	0	100
5	CA5155	Operating Systems	3	0	0	100
Practical						
6	CA5156	Object Oriented Programming Laboratory	0	0	3	100
7	CA5157	DBMS Laboratory	0	0	3	100
8	CA5158	Algorithms Laboratory	0	0	3	100

SEMESTER III

S.No	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	CA5201	Computer Networks	3	0	0	100
2	CA5202	Microprocessors and its Applications	3	1	0	100
3	CA5203	Software Engineering	3	0	0	100
4	CA5204	Computer Graphics and Multimedia Systems	3	1	0	100
5	CA5205	Internet Programming	3	0	0	100
Practical						
6	CA5206	Graphics and Multimedia Laboratory	0	0	3	100
7	CA5207	Microprocessor Laboratory	0	0	3	100
8	CA5208	Internet Programming Laboratory	0	0	3	100

SEMESTER IV

S.No	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	CA5251	UNIX and Network Programming	3	0	0	100
2	CA5252	Resource Management Techniques	3	0	0	100
3	E1***	Elective I	3	0	0	100
4	CA5253	Object Oriented Analysis and Design	3	1	0	100
5	CA5254	Middleware Technologies	3	0	0	100
Practical						
6	CA5255	Visual Programming Laboratory	2	0	3	100
7	CA5256	Unix and Network Programming Laboratory	0	0	3	100
8	CA5257	Middleware Laboratory	0	0	3	100

SEMESTER V

S.No	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	CA5301	XML and Web Services	3	0	0	100
2	E2***	Elective II	3	0	0	100
3	E3***	Elective III	3	0	0	100
4	E4***	Elective IV	3	0	0	100
5	CA5302	Software Project Management	3	0	0	100
Practical						
6	CA5303	XML and Web Services Laboratory	0	0	3	100
7	CA5304	Software Development Laboratory	0	0	3	100

SEMESTER VI

S.No	Subject Code	Subject	L	T	P	Max. Marks
1	CA5351	Project Work	0	0	24	400

ELECTIVES

S.No	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	CA5001	Numerical and Statistical Methods	3	1	0	100
2	CA5002	Electronic Commerce	3	0	0	100
3	CA5003	Management Information Systems	3	0	0	100
4	CA5004	Web Graphics	3	0	0	100
5	CA5005	Human Resource Management	3	0	0	100
6	CA5006	Advanced Databases	3	0	0	100
7	CA5007	Software Quality Management	3	0	0	100
8	CA5008	TCP/IP Protocol Suite	3	0	0	100
9	CA5009	Distributed Computing	3	0	0	100
10	CA5010	Data Warehousing and Data Mining	3	0	0	100
11	CA5011	Component Based Technologies	3	0	0	100
12	CA5012	Managerial Economics	3	0	0	100
13	CA5013	Mobile Computing	3	0	0	100
14	CA5014	Digital Imaging	3	0	0	100
15	CA5015	Enterprise Resource Planning	3	0	0	100
16	CA5016	Agent Based Intelligent Systems	3	0	0	100
17	CA5017	Natural Language Processing	3	0	0	100
18	CA5018	Software Agents	3	0	0	100
19	CA5019	Supply Chain Management	3	0	0	100
20	CA5020	Embedded Systems	3	0	0	100
21	CA5021	Portfolio Management	3	0	0	100
22	CA5022	Unix Internals	3	0	0	100
23	CA5023	Database Tuning	3	0	0	100
24	CA5024	Multi-Core Programming	3	0	0	100
25	CA5025	Service Oriented Architecture	3	0	0	100

ANNA UNIVERSITY TIRUCHIRAPPALLI
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Syllabus
SEMESTER I

CA5101 COMPUTER ORGANIZATION

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UNIT I FUNDAMENTALS OF DIGITAL DESIGN 9

Data Representation – Data Types – Complements – Arithmetic Operations – Representations – Fixed – Point – Floating – Point – Decimal Fixed – Point – Binary Codes – Logic Gates – Boolean Algebra – Map Simplification – Combinational Circuits: Half-Adder – Full Adder – Flip Flops – Sequential Circuits

UNIT II DIGITAL COMPONENTS REGISTERTRANSFER & MICROOPERATIONS 9

ICs – Decoders – Multiplexers – Registers – Shift Registers – Binary Counters – Memory Unit – Register Transfer Language – Register Transfer – Bus And Memory Transfers – Arithmetic – Logic And Shift Micro Operations – Arithmetic Logic Shift Unit

UNIT III COMPUTER ORGANIZATION AND PROGRAMMING 9

Instruction Codes – Computer Registers – Computer Instructions – Timing And Control – Instruction Cycle – Memory Reference Instructions – I/O And Interrupt – Machine Language – Assembly Language – Assembler – Program Loops – Programming Arithmetic And Logic Operations – Subroutines – I/O Programming

UNIT IV INPUT - OUTPUT ORGANIZATION 9

Peripheral Devices – Input – Output Interface – Asynchronous Data Transfer – Modes Of Transfer – Priority Interrupt – DMA – IOP – Serial Communication

UNIT V MEMORY ORGANIZATION AND CPU 9

Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory – Memory Management Hardware – CPU: General Register Organization – Control Word – Stack Organization – Instruction Format – Addressing Modes – Data Transfer And Manipulation – Program Control

Total: 45 hrs.

TEXT BOOK

1. M.Morris Mano, “Computer System Architecture”, Third Edition, Pearson Education, 2007.

REFERENCES

1. John P. Hayes, “Computer Architecture and Organization”, Third Edition Tata McGraw Hill, 1998.
2. V.C.Hamacher et al, “Computer Organization”, Fifth Edition, Tata Mcgraw Hill, 2002.

CA5102 PROBLEM SOLVING AND PROGRAMMING

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3 1 0

UNIT I PROBLEM SOLVING AND ALGORITHMS 9

The Problem Solving Aspect – Top Down Design – Implementation of Algorithms – Program Verification – Efficiency of Algorithms – Analysis of Algorithms – Exchanging the values – Counting – Factorial Computation – SINE Computation – Base Conversion

UNIT II PROBLEM SOLVING TECHNIQUES 9

Factoring Methods – Array Techniques – Merging – Sorting – Searching

UNIT III FUNDAMENTALS OF C LANGUAGE 9

Overview of C – Constants – Variables and Data Types – Operators and Expressions – Managing Input/Output Operations – Formatted I/O – Decision Making – Branching – IF – Nested IF – Switch – Goto – Looping Statements

UNIT IV ARRAYS - FUNCTIONS - STRUCTURES AND UNIONS 9

Arrays – Dynamic and multi dimensional arrays – Character arrays and Strings – String handling Functions – User defined Functions – Categories of Functions – Recursion – Structures and Unions – Array of Structures – Structures and Functions

UNIT V POINTERS AND FILE MANAGEMENT 9

Pointers – Declaration – Accessing a variable – Character Strings – Pointers to Functions and Structures – File Management in C – Dynamic Memory Allocation – Linked Lists – Preprocessors

L: 45 T: 15 Total: 60 hrs.

TEXT BOOKS

1. R.G. Dromey, “How to Solve it by Computer”, Pearson Education, 2007.
2. Deitel and Deitel, “C How to Program”, Addison Wesley, 2001.

REFERENCE

1. Brian W.Kernighan and Dennis Ritchie, “C Programming Language”, Pearson Education, 1998.

UNIT I ORGANIZATIONAL STRUCTURE 9

Types of Business Organizations – Organizational Structures – Definition – Complexity – Formulization – Size – Technology – Culture – Forms and Outcomes – Explanations of Structures – IT Industry and Organizational Structures – Case Studies

UNIT II ORGANIZATIONAL OUTCOMES 9

Organizational Power and Power Outcomes – Leadership and Decision Making – Communication and Organizational Change – Organizational Environments and Effects – Inter and Intra Organizational Relationships – Organizational Effectiveness – Case Studies

UNIT III BUSINESS PROCESS REENGINEERING 9

Introduction to Business Process Reengineering (BPR) – Meaning – Types – Process – Impetorative for Survival – Strategic Approach – Implementing Business Process Reengineering – Methodology and Steps – Indian Scenario of Implementing BPR – Case Studies

UNIT IV BPR AND IT INDUSTRY 9

BPR and Information Technology Process – People View and Perspectives – Empowering People through IT – Managing Change in the Global Environment – BPR Rediscovering Indian Paradigm – Need of Reengineering – Case Studies

UNIT V E-BUSINESS PROCESS 9

E-Business – Introduction – E-Business vs. E-Commerce – Execution of E-Business – Trends – Design for Execution – Construction – Types – Organizational Frame Work and Implementation – E -Business Application Areas(CRM – ERP – SCM and Selling) – E-Business and India – Case Studies

Total: 45 hrs.

TEXT BOOKS

1. M.S. Jayaraman Nadarajan, “Business Process Reengineering”, Tata McGraw Hill , 2002.
2. Ravi Kalakota and Marcia Robinson, “E – Business 2.0: Roadmap for Success”, Pearson Education, 2004.

REFERENCES

1. Gareth Jones, “Organizational Theory, Design and Change”, Fourth Edition, Pearson Education, 2004.
2. Dave Chaffey, “E - business and E - Commerce”, Second Edition, Pearson Education, 2003.

UNIT I BASIC DATA STRUCTURES 9

Arrays – Structures – The List ADT – The Stack ADT – The Queue ADT

UNIT II TREES 9

Binary Trees – Operations on Binary Trees – Binary Tree Representations – Node representation – Internal and External nodes – Implicit array representation – Binary Tree Traversals – Huffman Algorithm – Representing Lists as Binary Trees

UNIT III SORTING AND SEARCHING 9

Internal Sort – Exchange Sorts – Selection and Tree Sorting – Insertion Sorts – Merge and Radix Sorts – External Sort - Basic Search Techniques – Tree Searching – General Search Trees – Hashing

UNIT IV GRAPHS AND THEIR APPLICATIONS 9

Graphs – Application of Graphs – Representation – Transitive Closure – Warshall’s Algorithm – Shortest path Algorithm – A Flow Problem – Dijkstra’s algorithm – An application of scheduling – Linked representation of Graphs – Graph Traversals

UNIT V STORAGE MANAGEMENT 9

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

L: 45 T: 15 Total: 60 hrs.

TEXT BOOKS

1. Yedidyah Langsam, Moshe J. Augustine and Aaron M. Tanenbaum, “Data Structures using C”, Pearson Education, 2004.
2. Cormen T.H., Leiserson C.E, and Rivest R.L., “Introduction to Algorithms”, Prentice Hall , 2007

REFERENCES

1. Robert Kruse and Clovis L. Tondo, “Data Structures and Program Design in C”, Second Edition, Prentice Hall of India, 2002.
2. Weiss, “Data Structures and Algorithm Analysis in C”, Second Edition, Addison Wesley, 2007.

CA5105 ACCOUNTING AND FINANCIAL MANAGEMENT**L T P**
3 1 0**UNIT I FINANCIAL ACCOUNTING 9**

Meaning and Scope of Accounting – Principles – Concepts – Conventions – Accounting Standards – Final Accounts – Trail Balance – Trading Account – Profit and Loss Account – Balance Sheet – Accounting Ratio Analysis – Funds Flow Analysis – Cash Flow Analysis

UNIT II ACCOUNTING 9

Meaning – Objectives – Elements of Cost – Cost Sheet – Marginal Costing and Cost Volume Profit Analysis – Break Even Analysis – Applications – Limitations – Standard Costing and Variance Analysis – Material – Labor – Overhead – Sales – Profit Variances

UNIT III BUDGETS AND BUDGETING CONTROL 9

Budgets and Budgetary Control – Meaning – Types – Sales Budget – Production Budget – Cost of Production Budget – Flexible Budgeting – Cash Budget – Master Budget – Zero Base Budgeting – Computerized Accounting

UNIT IV INVESTMENT DECISION AND COST OF CAPITAL 9

Objectives and Functions of Financial Management – Risk – Return Relationship – Time Value of Money Concepts – Capital Budgeting – Methods of Appraisal – Cost of Capital Factors Affecting Cost of Capital – Computation for Each Source of Finance and Weighted Average Cost of Capital

UNIT V FINANCING DECISION AND WORKING CAPITAL MANAGEMENT 9

Capital Structure – Factors Affecting Capital Structure – Dividend Policy – Types of Dividend Policy – Concepts of Working Capital – Working Capital Policies – Factors affecting Working Capital – Estimation of Working Capital Requirements

L: 45 T: 15 Total: 60 hrs.**TEXT BOOKS**

1. S. N. Maheswari, “Financial and Management Accounting”, Sultan Chand & Sons, 2003.
2. I. M. Pandey, “Financial Management”, Fourth Edition, Vikas Publications, Reprint, 2002.

REFERENCES

1. S.P. Iyengar, “Cost and Management Accounting”, Sultan Chand & Sons.
2. I. M. Pandey, “Elements of Management Accounting”, Vikas Publishing House, 1993.

1. Represent the given sparse matrix using one dimensional array and linked list
2. Create a Stack and do the following operations using arrays and linked lists
(i)Push (ii) Pop (iii) Peep
3. Create a Queue and do the following operations using arrays and linked lists
(i)Add (ii) Remove
4. Implement the operations on singly linked list – doubly linked list and circular linked list.
5. Create a binary search tree and do the following traversals
(i)In –order (ii) Pre order (iii) Post order
6. Implement the following operations on a binary search tree
(i) Insert a node (ii) Delete a node
7. Sort the given list of numbers using heap and quick sort
8. Perform the following operations in a given graph
(i) Depth first search (ii) Breadth first search
9. Find the shortest path in a given graph using Dijkstra algorithm

Total: 45 hrs.

CA5107 PROGRAMMING LABORATORY

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1. Display the following:
 - (i) Floyd's triangle (ii) Pascal Triangle
2. Generate the following series of numbers:
 - (i) Armstrong numbers between 1 to 100
 - (ii) Prime numbers between 1 to 50
 - (iii) Fibonacci series up to N numbers
3. Manipulate the strings with following operations
 - (i) Concatenating two strings (ii) Reversing the string (iii) Finding the substring (iv) Replacing a string (v) Finding length of the string
4. Find the summation of the following series:
 - (i) Sine (ii) Cosine (iii) Exponential
5. Create the sales report for M sales person and N products using two dimensional arrays
6. Simulate the following Banking operations using functions
 - (i) Deposit (ii) Withdrawal (iii) Balance Enquiry
7. Implement using recursion
 - (i) Find the solution of Towers of Hanoi problem using recursion.
 - (ii) Fibonacci number generation.
 - (iii) Factorial of a number.
8. Generate Student mark sheets using structures
9. Create a collection of books using arrays of structures and do the following:
 - (i) Search a book with title and author name (ii) Sorts the books on title.

Total: 45 hrs.

SEMESTER II

CA5151 MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

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UNIT I MATRIX ALGEBRA 9

Matrices – Rank of Matrix – Solving System of Equations – Eigen Values and Eigen Vectors – Inverse of a Matrix – Cayley Hamilton Theorem

UNIT II BASIC SET 9

Basic Definitions – Venn Diagrams and set operations – Laws of set theory – Principle of Inclusion and Exclusion – Partitions – Permutation and Combination – Relations – Properties of relations – Matrices of relations – Closure operations on relations – Functions – Injective – Surjective and Bijective functions

UNIT III MATHEMATICAL LOGIC 9

Propositions and logical operators – Truth table – Propositions generated by set – Equivalence and Implication – Basic laws – Some more connectives – Functionally complete set of connectives – Normal forms – Proofs in Propositional calculus – Predicate calculus

UNIT IV FORMAL LANGUAGES 9

Languages and Grammars – Phrase Structure Grammar – Classification of Grammars – Pumping Lemma for Regular Languages – Context Free Languages

UNIT V FINITE STATE AUTOMATA 9

Finite State Automata – Deterministic Finite State Automata(DFA) – Non Deterministic Finite State Automata (NFA) – Equivalence of DFA and NFA – Equivalence of NFA and Regular Languages

L: 45 T: 15 Total: 60 hrs.

TEXT BOOKS

1. Kenneth H. Rosen, “Discrete Mathematics and its Applications”, Fifth Edition, Tata McGraw Hill, 2007.
2. Hopcroft and Ullman, “Introduction to Automata Theory, Languages and Computation”, Third Edition, Pearson Education, 2008.

REFERENCES

1. A. Tamilarasi and A.M. Natarajan, “Discrete Mathematics and its Application”, Second Edition, Khanna Publishers, 2005.
2. M. K. Venkataraman, “Engineering Mathematics”, Second Edition, National Publishing Company, Volume II, 1989.

CA5152 OBJECT ORIENTED PROGRAMMING

L T P
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UNIT I OOP PARADIGAM 7

Programming Paradigms – Procedural Programming – Modularity – Data Abstraction – User Defined Types – Object Oriented Programming – Generic Programming – Containers – Algorithms

UNIT II FUNDAMENTALS OF C++ 9

Overview of C++ – Classes and Objects – Friend Functions – Friend Classes – Inline Function – Static Members – Arrays – Pointers – References – Dynamic Allocation – I/O Streams – File I/O

UNIT III POLYMORPHISM 11

Function Overloading – Overloading Constructor Functions – Copy Constructors – Default Argument – Operator Overloading – Member Operator Overloading – Overloading new and delete – Inheritance – Base Class – Access Control – Virtual Functions – Pure Virtual Functions

UNIT IV ADDITIONAL FEATURES 9

Exception Handling – Templates-Generic Functions – Applying Generic Functions –Generic Classes – STL – Container Classes – Lists – Maps – Algorithms – String Class

UNIT V DESIGN CONCEPTS 9

Role of Classes – Kinds of Classes – Concrete Types – Abstract Types – Nodes – Changing Interfaces – Object I/O – Actions – Interface Classes – Handles – Use Counts – Applications frameworks

L: 45 T: 15 Total: 60 hrs.

TEXT BOOK

1. Ira Pohl, "Object Oriented Programming Using C++", Second Edition, Pearson Education, 2003.

REFERENCES

1. Herbert Schildt, "C++ The Complete Reference", Fourth Edition , Tata McGraw Hill, 2003 (Unit II, III, IV).
2. Bjarne Stroustrup, "The C++ Programming Language", Third Edition, Addison Wesley, 2004 (Unit I & V)
3. Robert Lafore, "Waite Groups OOP in Turbo C++", Galgotia Publications, 2001
4. Stanley, B.Lippman,Josee Lajoje, "C++Primer", Forth Edition, Addison Wesley, 2005

UNIT I FUNDAMENTALS 7

Fundamentals of algorithmic problem solving – Important problem types – Fundamentals of the analysis of algorithm efficiency – analysis frame work – Asymptotic notations – Mathematical analysis for recursive and non – recursive algorithms

UNIT II DIVIDE AND CONQUER METHOD AND GREEDY METHOD 9

Divide and Conquer methodology – Merge Sort – Quick Sort – Binary Search – Binary Tree Traversal – Multiplication of large integers – Strassen’s matrix multiplication – Greedy method – Prim’s algorithm – Kruskal’s algorithm – Dijkstra’s algorithm

UNIT III DYNAMIC PROGRAMMING 9

Computing a Binomial Coefficient – Warshall’s and Floyd’ Algorithm – Optimal Binary Search Tree – Knapsack problem – Memory functions

UNIT IV BACKTRACKING AND BRANCH AND BOUND 11

Backtracking – N-Queens problem – Hamiltonian circuit problem – Subset sum problem – Branch and Bound – Assignment problem – Knapsack problem – Traveling salesman problem

UNIT V NP - HARD AND NP - COMPLETE PROBLEMS 9

P & NP problems – NP-complete problems – Approximation Algorithms for NP – Hard problems – Traveling salesman problem – Knapsack problem

L: 45 T: 15 Total: 60 hrs.

TEXT BOOKS

1. Anany Levitin, “Introduction to the Design and Analysis of Algorithms”, Second Edition, Pearson Education, 2008.
2. Cormen T.H., Leiserson C.E, and Rivest R.L., “Introduction to Algorithms”, Prentice Hall India, 2007.

REFERENCES

1. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran “ Fundamentals of Computer Algorithms”, Galgotia, 2006
2. Weiss, “Data Structures and Algorithm Analysis in C”, Second Edition, Addison Wesley, 2007.

CA5154 DATABASE MANAGEMENT SYSTEMS

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UNIT I FUNDAMENTALS 9

Database Systems vs. File Systems – View of Data – Data Models – Database Languages – Transaction Management – Database Systems Structure – History of Database Systems – Database Systems Applications – Entity Relationship Model

UNIT II RELATIONAL DATABASES 9

The Relation - Keys - Constraints - Relational Algebra and Calculus – Queries -SQL – Basic Structure – Set Operations – Complex Queries – Joined Queries – DDL – Embedded SQL – Dynamic SQL –Other SQL Functions – Query by Example – Integrity and Security of searching – Relational Database Design.

UNIT III DATA STORAGE AND INDEXING 9

Storage & File Structure – Disks – RAID – File Organization – Indexing & Hashing – B+ TREE – B Tree – Static Hashing – Dynamic Hashing – Multiple Key Access

UNIT IV QUERY EVALUATION & OPTIMIZATION 9

Query Processing – Selection Operation – Sorting – Join Operation – Evaluation of Expressions – Query Optimization

UNIT V TRANSACTION MANAGEMENT 9

Transaction Concept – Static Implementation – Concurrency Control – Protocols –Deadlock Handling – Recovery Systems – Recovery with Concurrent Transactions – Shadow Paging – Buffer Management – Case Studies – Oracle – Microsoft SQL Server

Total: 45 hrs.

TEXT BOOK

1. Abraham Silberschatz, Henry F. Korth and S. Sudharsan, “Database System Concepts”, Fifth Edition, Tata McGraw Hill, 2006.

REFERENCES

1. Raghu Ramakrishnan and Johannesgerhrke, “DataBase Management Systems”, Third Edition, McGraw Hill, 2003.
2. C.J Date and Kannan, “An introduction to Data Base Systems”, Eighth Edition, Pearson Education, 2006.

UNIT I FUNDAMENTALS 7

Definition of OS – Mainframe System – Desktop Systems – Multi processor System – Distributed – Clustered – Real time Systems – Handheld Systems – Operating System Structure – System Components – Services – System Calls – System Programs – System Design and Implementation

UNIT II PROCESS MANAGEMENT 8

Concepts – Process Scheduling – Operations on Processes – Co-operating Processes – Inter Process Communication – CPU Scheduling – Scheduling Concepts – Criteria – Scheduling Algorithms – Multiprocessor Scheduling – Real time Scheduling

UNIT III PROCESS SYNCHRONIZATION 10

Critical Section – Synchronization Hardware – Semaphores – Problems of Synchronization – Critical Regions – Monitors – Deadlocks – Characterization – Handling Deadlocks – Deadlock Prevention – Avoidance – Detection – Deadlock Recovery

UNIT IV MEMORY MANAGEMENT 10

Storage Hierarchy – Storage Management Strategies – Contiguous-Non Contiguous Storage Allocation – Single User – Fixed Partition – Variable Partition – Swapping – Virtual Memory – Basic Concepts – Multilevel Organization – Block Mapping – Paging – Segmentation – Page Replacement Methods – Locality – Working Sets

UNIT V I/O AND FILE SYSTEMS 10

Disk Scheduling – File Concepts – File System Structure – Access Methods – Directory Structure – Protection – Directory Implementation – Allocation Methods – Free Space Management – Case Study: Linux System

Total: 45 hrs.

TEXT BOOKS

1. Silberschatz and Galvin, “Operating System Concepts”, Sixth Edition, John Wiley & Sons, Inc., 2004.
2. Milankovic M, “Operating System Concepts and Design”, Second Edition, Tata McGraw Hill, 2001.

REFERENCES

1. P.C. Bhatt, “An Introduction to Operating Systems - Concepts and Practice”, Prentice Hall of India, 2004.
2. H. M. Deitel, “An Introduction to Operating Systems”, Third Edition, Pearson Education, 2007.
3. Willam-Stalling, “Operating System”, Fourth Edition, Pearson Education, 2003.

1. Programs using Constructor and Destructor.
2. Creation of classes and use of different types of functions.
3. Count the number of objects created for a class using static member function.
4. Write programs using function overloading and operator overloading.
5. Programs using inheritance.
6. Program using friend functions.
7. Program using virtual function.
8. Write a program using exception handling mechanism.
9. Programs using files.
10. Programs using function templates.

Total: 45 hrs.

CA5157 DBMS LABORATORY

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1. Execute a single line and group functions for a table.
2. Execute DCL and TCL Commands.
3. Create and manipulate various DB objects for a table.
4. Create views – partitions and locks for a particular DB.
5. Write PL/SQL procedure for an application using exception handling.
6. Write PL/SQL procedure for an application using cursors.
7. Write a DBMS program to prepare reports for an application using functions.
8. Write a PL/SQL block for transaction operations of a typical application using triggers.
9. Write a PL/SQL block for transaction operations of a typical application using package.
10. Design and develop an application using any front end and back end tool (make use of ER Diagram and DFD).
11. Develop an application using Menus
12. Importing / Exporting Data
13. Reports Creations

Typical Applications – Banking – Electricity Billing – Library Operation – Pay roll – Insurance – Inventory – etc.

Total: 45 hrs.

CA5158 ALGORITHMS LABORATORY

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1. Apply the divide and Conquer technique to arrange a set of numbers using merge sort method.
2. Perform Strassen's matrix multiplication using divide and conquer method.
3. Solve the knapsack problem using greedy method.
4. Construct a minimum spanning tree using greedy method.
5. Construct optimal binary search trees using dynamic programming method of problem solving.
6. Find the solution for traveling salesperson problem using dynamic programming approach.
7. Perform graph traversals.
8. Implement the 8 Queens Problem using backtracking.
9. Implement knapsack problem using backtracking.
10. Find the solution of traveling salesperson problem using branch and bound technique.

Total: 45 hrs.

SEMESTER III

CA5201 COMPUTER NETWORKS

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3	0	0

UNIT I NETWORK ARCHITECTURE 9

Layering and Protocols – OSI Architecture – Internet Architecture – Link and Medium Access Protocols – Framing – Error Detection – reliable Transmission – IEEE 802 Standards – Ethernet – Token Rings – Wireless – Network Adapters

UNIT II NETWORK LAYER 9

Circuit Switching – Packet Switching – Switching and Forwarding – Bridges and LAN Switches – Cell Switching – Inter networking – Routing – Global Internet – Multicast

UNIT III TRANSPORT LAYER 9

UDP – TCP – Remote Procedure Call – Performance – Congestion Control and Resource Allocation – TCP Congestion Control – Congestion Avoidance Mechanisms – Quality of Service: Bandwidth – Delay – Jitter

UNIT IV NETWORK SECURITY AND APPLICATION 9

Cryptographic Algorithms – DES – RSA – MD5 – Security Mechanisms – Fire Walls – Name Service – Traditional Applications – SMTP – HTTP – Multimedia Application – RTP – RTCP – SCTP

UNIT V NETWORK MANAGEMENT 9

Introduction – Network Monitoring – Network Control – SNMPV I Network Management Concepts – Information – Standard MIBS

Total: 45 hrs.

TEXT BOOK

1. Larry L. Peterson and Bruce S. Davie, “Computer Networks – A Systems Approach”, Harcourt Asia / Morgan Kaufmann, Second Edition, 2000.

REFERENCES

1. William Stallings, “Data and Computer Communications”, Fifth Edition, Prentice Hall of India, 1997.
2. James F.Kurose and Keith W.Ross, “Computer Networking – A Top Down Approach Featuring the Internet”, First Edition, Addison Wesley, 2001.
3. Andrew S. Tanenbaum, “Computer Networks”, Third Edition, Pearson Education 2001.

CA5202 MICROPROCESSORS AND ITS APPLICATIONS

L	T	P
3	1	0

UNIT I FUNDAMENTALS OF 8085 MICRO PROCESSOR 9

UNIT I FUNDAMENTALS 9

A Generic View of Process – Process Models – The Waterfall Model – Incremental Model – Evolutionary Model – Specialized Model – The Unified Process – Agile Process – Agile Models – Software Cost Estimation – Planning – Risk Analysis – Software Project Scheduling

UNIT II REQUIREMENT ANALYSIS 9

System Engineering Hierarchy – System Modeling – Requirements Engineering: Tasks – Initiating the Process – Eliciting Requirements – Developing Use Cases – Negotiating Requirements – Validating Requirements – Building the Analysis Models: Concepts

UNIT III SOFTWARE DESIGN 9

Design Concepts – Design Models – Pattern Based Design – Architectural Design – Component Level Design – Component – Class Based And Conventional Components Design – User Interface – Analysis And Design

UNIT IV SOFTWARE TESTING 9

Software Testing – Strategies: Conventional – Object Oriented – Validation Testing – Criteria – Alpha – Beta Testing – System Testing – Recovery – Security – Stress – Performance – Testing Tactics – Testing Fundamentals – Black Box – While Box – Basis Path – Control Structure

UNIT V SCM AND QUALITY ASSURANCE 9

Software Configuration And Management – Features – SCM Process – Software Quality Concepts – Quality Assurance – Software Review – Technical Reviews – Formal Approach To Software Quality Assurance – Reliability – Quality Standards – Software Quality Assurance Plan

Total: 45 hrs.

TEXT BOOK

1. Roger Pressman.S, “Software Engineering: A Practitioner's Approach”, Sixth Edition, Tata Mcgraw Hill, 2005.

REFERENCES

1. P. Fleeger, “Software Engineering”, Prentice Hall of India, 1999.
2. Carlo Ghezzi, Mehdi Jazayari, Dino Mandrioli, “Fundamentals Of SoftwareEngineering”, Prentice Hall of India, 1991.
3. Sommerville, “Software Engineering”, Seventh Edition, Addison Wesley, 2005.

CA5204 COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS

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UNIT I FUNDAMENTALS 9

Overview of Graphics System – Bresenham technique – Line Drawing and Circle Drawing Algorithms – DDA – Line Clipping – Text Clipping

UNIT II 2D TRANSFORMATIONS 9

Two dimensional transformations – Scaling and Rotations – Interactive Input methods – Polygons – Splines – Bezier Curves – Window view port mapping transformation

UNIT III 3D TRANSFORMATIONS 9

3D Concepts – Projections – Parallel Projection – Perspective Projection – Visible Surface Detection Methods – Visualization and polygon rendering – Color models – XYZ – RGB – YIQ – CMY – HSV Models – Animation – Key Frame systems – General animation functions – Morphing

UNIT IV OVERVIEW OF MULTIMEDIA 9

Multimedia hardware & software – Components of multimedia – Text – Image – Graphics – Audio – Video – Animation – Authoring

UNIT V MULTIMEDIA SYSTEMS AND APPLICATIONS 9

Multimedia communication systems – Database systems – Synchronization Issues – Presentation requirements – Applications – Video conferencing – Virtual reality – Interactive video – Video on demand

L: 45 T: 15 Total: 60 hrs.

TEXT BOOKS

1. Ralf Steinmetz and Klara Steinmetz, “Multimedia Computing: Communications and Applications”, Pearson Education, 2004.
2. Hearn D and Baker M.P, “Computer graphics, C Version”, Second Edition Pearson Education, 2004.

REFERENCES

1. Siamon J. Gibbs and Dionysios C. Tsichritzis, “Multimedia programming”, Addison Wesley, 1995.
2. John Villamil, Casanova and Leony Fernandez, Eliar, “Multimedia Graphics”, Prentice Hall of India, 1998.
3. Newman and Sproul, “Interactive Computer Graphics“, Tata Megraw Hill , 2002.

UNIT I BASIC NETWORK AND WEB CONCEPTS 8

Internet standards – Basic Internet Protocols – TCP/IP and UDP – DNS – Higher-Level Protocols – MIME – HTTP Request Message – HTTP Response Message – Web Client – Web Servers – Common Gateway Interface

UNIT II CLIENT-SIDE PROGRAMING 8

XHTML – CSS – JavaScript – Need of a Scripting Language – Language Elements – Object of JavaScript – Representing Web Data: XML – XML Documents and Vocabularies – XML Declaration – XML Namespace – JavaScript and XML: Ajax

UNIT III JAVA FUNDAMENTALS 8

Classes – Object – Reflection – Garbage Collection – Exception Handling – I/O Streaming – Files – Serialization – Threading

UNIT IV JAVA NETWORK PROGRAMMING 10

Looking up Internet Addresses – Retrieving Data with URLs – Sockets for Client – Sockets for Server – Secure Sockets – UDP Datagrams and Sockets – Multicast Sockets – Protocol Handlers – Content Handlers

UNIT V SERVER-SIDE PROGRAMMING 11

Java Servlets – Servlet Architecture – Servlet Life Cycle – Parameter Data – Session Tracking – Servlet and Concurrency – Separating Programming and Presentation – JDBC – JSP – Components of JSP – Reading Request Information – JSP Sessions

Total: 45 hrs.

TEXT BOOKS

1. Jeffrey C.Jackson , “Web Technologies A Computer Science Perspective”, Pearson Education, 2007.
2. Deitel, Deitel and Neito “Java How to Program “,Fifth Edition, Pearson Education, 2004.

REFERENCES

1. Deitel, Deitel and Neito, “Internet and World Wide Web, How to program”, Fifth Edition, Pearson Education , 2005.
2. N.P.Gopalan and J.Akilandeswari, “Web Technology A Developer’s Perspective”, Prentice Hall of India,-2007.
3. Marty Hall and Larry Brown, “ Core Servlets and Java Server Pages “, Volume 1, Pearson Education, 2007.
4. Elliotte Rusty Harold, ”Java Network Programming”, O’Reilly Publishers, 2001
5. Cay S.Horstman,Gary Cornell, “Core Java “, Volume I, II, Eighth Edition, Pearson Education, 2008.

CA5206 GRAPHICS AND MULTIMEDIA LABORATORY

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1. Implementation of Bresenham's algorithms.
 a) Line b) Circle c) Ellipse.
2. 2D Transformations:
 a) Translation
 b) Rotation
 c) Scaling
 d) Reflection
 e) Shearing of Objects
3. Cohen-Sutherland 2D clipping and windowing.
4. 3D Transformations:
 a) Translation
 b) Rotation
 c) Scaling
5. To implement text compression algorithm.
6. To implement image compression algorithm.
7. Animation using any Animation software.
8. Basic operations on image using any image editing software.
9. Examples using PHOTOSHOP, FLASH, and MAYA.

Total: 45 hrs.

1. Write an assembly language program to perform arithmetic operations on block of data using Hexadecimal numbers.
2. Write an assembly language program to perform arithmetic operations on block of data using BCD numbers.
3. Write an assembly language program to perform byte and string manipulation.
4. Write an assembly language program to interface Programmable Peripheral Interface.
5. Write an assembly language program to interface Programmable Timer.
6. Write an assembly language program to interface Programmable Communication Interface.
7. Write an assembly language program to interface Keyboard/Display Controller.
8. Write a program to Perform Power on Self Test.
9. Write a program for floppy disk trouble shooting.
10. Write a program for printer trouble shooting.

Total: 45 hrs.

1. Program to illustrate the use of overloading and overriding.
2. Program to implement the concept of Interfaces and packages.
3. Generate the program using exceptions handling mechanism.
4. Threading – Synchronization of Threads and Applications.
5. Program to achieve Inter thread communication and deadlock avoidance.
6. Implementation of Streaming Models.
7. Implement the file operations.
8. Socket Programming.
9. Implementation of UDP Datagrams, SMTP Client, FTP Application.
10. JDBC Applications – Data Retrieval.
11. Program using Servlets.
12. Session Management using servlets.
13. Program using JSP.
14. Session Management using servlets.

Total: 45 hrs.

SEMESTER IV

CA5251 UNIX AND NETWORK PROGRAMMING

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UNIT I FUNDAMENTALS OF FILE SYSTEM 9

Overview of UNIX OS – File I/O – File Descriptors – File sharing – Files and directories – File types – File access permissions – File systems – Symbolic links – Standard I/O library – Streams and file objects – Buffering – System data files and information – Password file – Group file – Login accounting – system identification

UNIT II PROCESSES 9

Environment of a UNIX process - Process termination - Command line arguments - Process control - Process identifiers - Process relationships terminal logins - Signals - Threads

UNIT III INTERPROCESS COMMUNICATION 9

Introduction – Message passing (SVR4) – Pipes – FIFO – Message queues – Synchronization (SVR4) – Mutexes – Condition variables – Read-Write locks – File locking – Record locking – Semaphores – Shared memory (SVR4)

UNIT IV SOCKETS 9

Introduction – Transport layer – Socket introduction – TCP sockets – UDP sockets – Raw sockets – Socket options – I/O multiplexing – Name and address conversions

UNIT V APPLICATIONS 9

Debugging techniques – TCP echo client server – UDP echo client server – Ping – Trace route – Client server applications like file transfer and chat

Total: 45 hrs.

TEXT BOOKS

1. W. Richard Stevens, “Advanced programming in the UNIX environment”, Addison Wesley, 1999.
2. W. Stevens, Bill Fenner, and Andrew Rudoff, “Unix Network Programming”, Volume 1, Third Edition, Pearson Education, 2003.

REFERENCES

- 1 Meeta Gandhi, Tilak Shetty and Rajiv Shah, “The C Odyssey Unix, The open Boundless C”, First Edition, BPB Publications, 1992.
2. Uresh Vahalia, “UNIX Internals “ Pearson Education, 2008.

UNIT I LINEAR PROGRAMMING MODELS 9

Mathematical Formulation – Graphical Solution of linear programming models – Simplex method – Artificial variable Techniques – Variants of Simplex method

UNIT II TRANSPORTATION AND ASSIGNMENT MODELS 9

Mathematical formulation of transportation problem – Methods for finding initial basic feasible solution – Optimum solution – Degeneracy – Mathematical formulation of assignment models – Hungarian Algorithm – Variants of the Assignment problem

UNIT III INTEGER PROGRAMMING MODELS 9

Formulation – Gomory’s IPP Method – Gomory’s Mixed Integer Method – Branch and Bound Technique.

UNIT IV SCHEDULING BY PERT AND CPM 9

Network Construction – Critical Path Method – Project Evaluation and Review Technique – Resource Analysis in Network Scheduling

UNIT V QUEUEING MODELS 9

Characteristics of Queuing Models – Poisson Queues – (M / M / 1): (FIFO / ∞ / ∞) – (M / M / 1): (FIFO / N / ∞) – (M / M / C): (FIFO / ∞ / ∞) – (M / M / C): (FIFO / N / ∞) models

Total: 45 hrs.

TEXT BOOK

1. Taha H.A, “Operations Research: An Introduction”, Seventh Edition, Pearson Education, 2004.

REFERENCES

1. A.M. Natarajan, P. Balasubramani, A. Tamilarasi, “Operations Research”, Pearson Education, 2005.
2. Prem Kumar Gupta, D. S. Hira, “Operations Research”, Third Edition, S. Chand & Company, 2003.

UNIT I BASIC CONCEPTS 9

An overview – Object basics – Object state and properties – Behavior – Methods – Messages – Information hiding – Class hierarchy – Relationships – Associations – Aggregations – Identity – Dynamic binding – Persistence – Metaclasses – Object oriented system development life cycle

UNIT II METHODOLOGY AND UML 9

Introduction – Survey – Rumbugh – Booch – Jacobson methods – Patterns – Frameworks – Unified approach – Unified modeling language – Static and Dynamic models – UML diagrams – Class diagram – Usecase diagrams – Dynamic modeling – Model organization – Extensibility

UNIT III OBJECT ORIENTED ANALYSIS 9

Identifying Usecase – Business object analysis – Usecase driven object oriented analysis – Usecase model – Documentation – Classification – Identifying object – Relationships – Attributes – Methods – Super – Sub class – A part of relationships Identifying attributes and methods – Object responsibility

UNIT IV OBJECT ORIENTED DESIGN 9

Design process – Axioms – Colollaries – Designing classes – Class visibility – Refining attributes – Methods and Protocols – Object storage and Object interoperability – Databases – Object relational systems – Designing interface objects – Macro and Micro level processes – The purpose of a view layer interface

UNIT V SOFTWARE QUALITY 9

Quality assurance – Testing strategies – Object orientation testing – Test cases – Test Plan – Debugging principles – Usability – Satisfaction – Usability testing – Satisfaction testing

L: 45 T: 15 Total: 60 hrs.**TEXT BOOKS**

1. Ali Bahrami, “Object Oriented System Development”, McGraw Hill International Edition, 1999.
2. Martin Fowler, “UML Distilled”, Second Edition, Pearson Education, 2002.

REFERENCES

1. Craig Larman, “Applying UML and Patterns”, Second Edition, Pearson Education, 2002
2. Grady Booch, James Rumbaugh, Ivar Jacobson, “The Unified Modeling Language User Guide”, Addison Wesley Long man, 1999.
3. Bernd Bruegge, Allen H. Dutoit, “Object Oriented Software Engineering using UML, Patterns and Java”, Pearson Education, 2004.

UNIT I	INTRODUCTION	7
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Emergence of Middleware – Objects, Web Services – Middleware Elements -Vendor Architecture – Interoperability – Middleware in Distributed Applications – Types of Middleware – Transaction-Oriented Middleware – MOM – RPC

UNIT II	OBJECT ORIENTED MIDDLEWARE	12
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OOM – Developing with OOM – Dynamic Object Request – Distributed Architecture – Remote Method Calls – RMI Architecture – The RMI Programming – RMI Registry – Parameters and Return Values in Remort Method

UNIT III	EJB APPLICATIONS	12
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EJB Architecture – Overview of EJB software architecture – Conversation – Building and Deploying EJBs – Roles in EJB – EJB Session Beans – EJB Entity Beans – EJB clients – EJB Deployment

UNIT IV	CORBA	7
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CORBA – Distributed Systems – Purpose – Exploring CORBA alternatives – Architecture Overview – CORBA and Networking model – CORBA Object Model – IDL – ORB – Building an application with CORBA

UNIT V	COM	7
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COM – Data types – Interfaces – Proxy and Stub – Marshalling – Implementing Server / Client – Interface Pointers – Object Creation – Invocation – Destruction – Comparison COM and CORBA – Introduction to .NET – Overview of .NET architecture – Marshalling – Remoting

Total: 45 hrs.

TEXT BOOKS

1. Chris Britton and Peter Eye, “IT Architecture and Middleware”, Second Edition, Pearson Education, 2004.
2. Wolfgang Emmerich, “Engineering Distributed Objects”, John Wiley, 2000.
3. Tom Valesky, “Enterprise Java Beans”, Pearson Education, 2002.
4. Jason Pritchard, “COM and CORBA side by side”, Addison Wesley, 2000.

REFERENCES

1. Qusay H. Mahmoud, “Middleware for Communications”, John Wiley and Sons, 2004.
2. Gerald Brose, Andreas Vogel, Keith Duddy, “JavaTM Programming with CORBATM: Advanced Techniques for Building Distributed Applications”, Third Edition, Wiley, January, 2004.
3. Michah Lerner, “Middleware Networks: Concept, Design and Deployment of Internet Infrastructure”, Kluwer Academic Publishers, 2000.

CA5255 VISUAL PROGRAMMING LABORATORY

1. Program using application wizard :
SDI – MDI – Drawing inside the View Window – Device Context
2. Program to handle basic events:
The message map – saving the view's state – initializing a view class data member.
3. Program using graphical device interface objects
4. Program to display modal and modalless dialogs.
5. Program using static and dynamic controls
6. Program using document – view architecture
7. Program with tool bars and status bars
8. Program using SDI and MDI serialization
9. Program to create dynamic link libraries using MFC
10. Program to interface with database

L: 30 P: 45 Total: 75 hrs.

1. Program using basic network commands
2. Program using system calls : create – open – read – write – close – stat – fstat – lseek
3. Program to implement inter process communication using pipes
4. Program to perform inter process communication using message queues
5. Program to perform inter process communication using shared memory
6. Program to perform synchronization using semaphores
7. Program to capture packets : sniffer
8. Program using TCP sockets (Client and Server)
9. Program using UDP sockets (Client and Server)
10. Program using URL class to download webpages

Total: 45 hrs.

CA5257 MIDDLEWARE LABORATORY

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1. Create a distributed application to download various files from various servers using RMI.
2. Create a Java Bean to draw various graphical shapes and display it using or without using JDK
3. Develop an Enterprise Java Bean for Banking operations
4. Develop an Enterprise Java Bean for Library operations
5. Create an Active –X control for File operations
6. Develop a component for converting the currency values using COM / .NET
7. Develop a component for encryption and decryption using COM / .NET
8. Develop a component for retrieving information from message box using DCOM / .NET.
9. Develop a middleware component for retrieving Stock Market Exchange information using CORBA
10. Develop a middleware component for retrieving Weather Forecast information using CORBA

Total: 45 hrs.

SEMESTER V

CA5301 XML AND WEB SERVICES

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UNIT I XML TECHNOLOGY FAMILY

XML – Benefits – Advantages of XML over HTML – EDI – Databases – XML based standards – DTD – XML Schemas – X-Files – XML Processing – DOM – SAX – Presentation technologies – XSL – XFORMS – XHTML – Voice XML – Transformation – XSLT – XLINK – XPATH – XQ

UNIT II ARCHITECTING WEB SERVICES

9

Business motivations for web services – B2B – B2C – Technical motivations – Limitations of CORBA and DCOM – Service Oriented Architecture (SOA) – Architecting web services – Implementation view – Web services technology stack – Logical view – Composition of web services – Deployment view – From application server to peer to peer – Process view – Life in the runtime

UNIT III WEB SERVICES BUILDING BLOCK

9

Transport protocols for web services – Messaging with web services – Protocols – SOAP – Describing web services – WSDL – Anatomy of WSDL – Manipulating WSDL – Web service

policy – Discovering web services – UDDI – Anatomy of UDDI – Web service inspection – Ad-Hoc Discovery – Securing web services

UNIT IV IMPLEMENTING XML IN E – BUSINESS 9

B2B – B2C Applications – Different types of B2B interaction – Components of E-business XML systems – ebXML – Rosetta Net Applied XML in vertical industry – Web services for mobile devices

UNIT V XML AND CONTENT MANAGEMENT 9

Semantic Web – Role of Meta data in web content – Resource Description Framework – RDF schema – Architecture of semantic web – Content management workflow – XLANG – WSFL

Total: 45 hrs.

TEXT BOOKS

1. Ron Schmelzer, Travis Vandersypen and Jason Bloomberg, “XML and Web Services”, Pearson Education, 2002.
2. Sandeep Chatterjee and James Webber, “Developing Enterprise Web Services: An Architect's Guide”, Prentice Hall, 2004.

REFERENCES

1. Frank P.Coyle, “XML, Web Services and the Data Revolution”, Pearson Education, 2002.
2. Keith Ballinger, “.NET Web Services Architecture and Implementation”, Pearson Education,2003.
3. Henry Bequet and Meeraj Kunnumpurath, “Beginning Java Web Services”, Apress, 2004.
4. Russ Basiura and Mike Batongbacal, “Professional ASP .NET Web Services”, Apress, 2003

CA5302 SOFTWARE PROJECT MANAGEMENT

**L T P
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UNIT I FUNDAMENTALS 9

Introduction to Competencies – Product Development Techniques – Management Skills – Product Development Life Cycle – Software Development Process and models – The SEI CMM – International Organization for Standardization

UNIT II DOMAIN PROCESSES 9

Managing Domain Processes – Project Selection Models – Project Portfolio Management – Financial Processes – Selecting a Project Team – Goal and Scope of the Software Project – Project Planning – Creating the Work Breakdown Structure – Approaches to Building a WBS – Project Milestones – Work Packages – Building a WBS for Software

UNIT III SOFTWARE DEVELOPMENT 9

Tasks and Activities – Software Size and Reuse Estimating – The SEI CMM – Problems and Risks – Cost Estimation – Effort Measures – COCOMO: A Regression Model – COCOMO II – SLIM: A Mathematical Model – Organizational Planning – Project Roles and Skills Needed

UNIT IV SCHEDULING ACTIVITIES 9

Project Management Resource Activities – Organizational Form and Structure – Software Development Dependencies – Brainstorming – Scheduling Fundamentals – PERT and CPM –

UNIT V QUALITY ASSURANCE

9

Quality: Requirements – The SEI CMM – Guidelines – Challenges – Quality Function Deployment – Building the Software Quality Assurance – Plan – Software Configuration Management: Principles – Requirements – Planning and Organizing – Tools – Benefits – Legal Issues in Software – Case Study

Total: 45 hrs.

TEXT BOOK

1. Robert T. Futrell, Donald F. Shafer, Linda I. Safer, “Quality Software Project Management”, Pearson Education, 2002.

REFERENCES

1. Pankaj Jalote, “Software Project Management in Practice”, Addison Wesley, 2002.
2. Hughes, “Software Project Management”, Third Edition, Tata McGraw Hill, 2004.

CA5303 XML AND WEB SERVICES LABORATORY

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1. Create an XML document to store an address book.
2. Create an XML document to store information about books and create the DTD files.
3. Create an XML schema for the book's XML document from exercise 2.
4. Create an XML document to store resumes for a job web site and create the DTD file
5. Present the book's XML document using cascading style sheets (CSS).
6. Write an XSLT program to extract book titles - authors - publications - book rating from the book's XML document and use formatting.
7. Use Microsoft DOM to navigate and extract information from the book's XML document.
8. Use Microsoft DSO to connect HTML form or VB form to the book's XML document and display the information.
9. Create a web service for temperature conversion with appropriate client program.
10. Create a web service for currency conversion (at five currencies) with appropriate client program.

Total: 45 hrs.

CA5304 SOFTWARE DEVELOPMENT LABORATORY

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Develop Software using CASE tools for the applications like:

1. Online railway reservation system
2. Payroll processing application
3. Inventory system
4. Automating the banking process
5. Software for game
6. Library management system
7. Create a dictionary
8. Text editor
9. Telephone directory
10. Create an E –Book of your choice

Total :45 hrs.

Original Software Required:

- **Languages:** C/C++/Java/JSDK/Web browser.
- Any front end tool (like VB – VC++ – Developer 2000) etc
- **Any backend tool** (Oracle – Ms –Access – SQL) etc.
- **Any CASE tool**

ELECTIVES

CA5001 NUMERICAL AND STATISTICAL METHODS

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UNIT I LINEAR SYSTEM OF EQUATIONS 9

Solution of Systems of equations – Solution of Simultaneous linear equations – Gauss elimination methods – Gauss Jordan methods – Jacobi and Gauss Seidal iterative methods

UNIT II NUMERICAL DIFFERENTIATION AND INTEGRATION 9

Interpolation – Differentiation and integration – Difference table – Newton’s forward and backward interpolation – Lagrangian interpolation – Differentiation formulae – Trapezoidal and Simpson rule Gaussian – Quadrature

UNIT III DIFFERENTIAL EQUATIONS 9

Ordinary Differential equations – Taylor Series and Euler methods – Runge-Kutta methods – Predictor-Corrector method – Milne and Adam – Bashforth methods – Error Analysis

UNIT IV PROBABILITY DISTRIBUTIONS 9

Probability axioms – Bayes Theorem – Discrete random variables and Continuous random variables – Probability Density and Mass functions – Joint and marginal distributions – Conditional distributions – Characteristic function – Moment generating function – Expectation

UNIT V SAMPLING DISTRIBUTIONS 9

Small sample – t – test – F –test – χ^2 – test – ANOVA one way classification and two way classification

L: 45 T: 15 Total: 60 hrs.

TEXT BOOKS

1. Grewal B. S, “Numerical methods in Engineering and Science”, Khanna Publishers, 1994.
2. John E. Freund, Irwin Miller, Marylees Miller, “Mathematical Statistics with Applications”, Prentice Hall of India, Seventh Edition, 2004.

REFERENCES

1. A. M. Natarajan & A. Tamilarasi, “Probability Random Processes and Queuing theory”, Seventh Edition, New Age International Publishers, 2007.

2. S. K. Gupta, "Numerical Methods for Engineers", New age International Publishers, 2005.

UNIT I FUNDAMENTALS 6

Networks and Commercial Transactions – Internet and Other Novelties – Electronic Transactions Today – Commercial Transactions – Establishing Trust – Internet Environment – Internet Advantage – World Wide Web.

UNIT II SECURITY TECHNOLOGIES 9

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

UNIT III ELECTRONIC PAYMENT METHODS 9

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 – InfoHaus – Security Considerations – CyberCash – Model – Security – Customer Protection – Client Application – Selling through CyberCash

UNIT V ONLINE COMMERCE ENVIRONMENTS 12

Servers and 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 hrs.

TEXT BOOK

1. Pete Loshin, “Electronic Commerce”, Fourth Edition, Firewall media, an imprint of laxmi publications, 2004.

REFERENCES

1. Jeffrey F. Rayport and Bernard J. Jaworski, “Introduction to E-Commerce”, Second Edition, Tata McGraw Hill, 2003.
2. Greenstein, “Electronic Commerce”, Tata McGraw Hill, 2000.

UNIT I SYSTEM CONCEPTS 7

Definition – Computer based user machine system – Integrated system – Need for a database – Utilization of models – Evolution – Subsystems – Organizational subsystems – Activities subsystems

UNIT II ORGANIZATIONAL STRUCTURE 9

Basic model – Hierarchical – Specialization – Formalization – Centralization – Modifications of basic organizational structure – Project organization – Lateral relations – Matrix organization – Organizational culture and power organizational change

UNIT III STRUCTURE OF MIS 10

Operating elements – Physical components – Processing functions – Outputs – MIS support for decision making – Structured programmable decisions – Unstructured non-programmable decisions – MIS structure based on management activity and organizational functions – Synthesis of MIS structure

UNIT IV SYSTEM SUPPORT 10

Data representation – Communication network – Distributed systems – Logical data concepts – Physical storage devices – File organizations – Data base organization – Transaction processing

UNIT V DEVELOPMENT AND MANAGEMENT 9

A contingency approach to choosing an application – Developing strategy – Lifecycle definition stage – Lifecycle development stage – Lifecycle installation and operation stage – Project management

Total: 45 hrs.

TEXT BOOK

1. Gordon B. Davis, Margrethe H. Olson, “Management Information Systems, Conceptual foundations, Structure and development”, Tata Mc Graw Hill, Second Edition, 2000.

REFERENCES

1. E. Wainright Martin, Carol V. Brown, Danial W. DeHayes, Jeffrey A. Hoffer, and William C. Perkins, “Managing Information Technology”, Third Edition, Prentice Hall International , 1999.
2. Harold Koontz, and Heinz Weihrich, “Essentials of Management”, Fifth Edition, Tata McGraw Hill, 1998.

CA5004 WEB GRAPHICS

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UNIT I FUNDAMENTALS 9

HTML coding – Basic web graphics – Web page design and site building – Image maps – Adding multimedia to the web

UNIT II PAINT SHOP PRO/PHOTOSHOP 9

Introduction – Image Basics – File Formats – GIF – JPEG – Color Palette – Layers – Creating new Images – Brushes – Grids – Scaling Images – Moving and Merging Layers – Tool Palette – Screen capturing – Grey styling – Using style Palette – Animation

UNIT III IMAGE HANDLING 9

Scanning Images – Adding Text to the images – Designing icons – Creating background images – Color models – Color depths – Color calibration – Creating gradients – Oil paint effect

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

Creating web site with a particular theme using all the utilities – Graphics – Animations and Interaction

Total: 45 hrs.

TEXT BOOKS

1. Richard Schrand, “Photoshop 6 Visual Jumpstrat” Adobe Press, 2000.
2. James L. Mohles, “Flash 5.0 Graphics, Animation & Interaction”, Macromedia 2000.

REFERENCES

1. Deitel, “Internet and World Wide Web How to program”, Prentice Hall of India, 2003.
2. Robert Reinhardt and Jon Warren Lentz, “Flash 5 Bible”, Hungry Minds Inc, 2001.

CA5005 HUMAN RESOURCE MANAGEMENT

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UNIT I LEADERSHIP 9

Technical Leadership – Leader's Goal– Conviction – Vision – Transformational and Transactional Leadership – Leader’s Vision – Professionalism : Importance – Elements – Managing Awareness – Performance – Manager's Role in Professionalism

UNIT II MANAGING TECHNICAL AND PROFESSIONAL PEOPLE 9

Goals of Engineers and Scientists – Work Assignment – Need for Influence – Professional Career and Goals – Age and Creativity – Performance – Motivation – Employee Partnership – Career Risks – Technical Competence – Professional Discipline – Manager's Role in Professional Discipline – Guidelines

UNIT III IDENTIFICATION AND DEVELOPMENT OF TALENTED PEOPLE 9

Talented Professionals – Importance – Characterization – Identification – Assessment and Recognizing Talent – Development – Development Needs – Counseling

UNIT IV INNOVATION 9

The Importance of Innovation – Risk of Failure – Nature of Creativity – Imagination – Managing Innovative Teams – Needs of Creative Teams – Team Dynamics – A Software Development Example – Manager's Responsibility – Team's Personal Needs – Political versus Technical Solutions – Team Synergism

UNIT V TEAM ENVIRONMENT AND RECOGNITION 9

Innovative Team Environment – Award Programs – Recognition Programs – An Example Award Plan – Industry Award Plans – Award Guidelines – Incentive Plans – A Caution on Recognition Programs

Total: 45 hrs.

TEXT BOOK

1. Watts S. Humphrey, “Managing Technical People, Innovation, Teamwork and the Software Process”, Addison Wesley, 1996.

REFERENCES

1. Biswajeet Pattanayak, “Human Resource Management”, Prentice Hall of India, 2002.
2. K. Aswathappa, “Human Resource and Personnel Management text and cases”, Tata Mc Graw Hill, 2002.

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UNIT I RELATIONAL DATABASES 9

Relational Model – Querying – Storage Structures – Query Processing – Normalization

UNIT II OBJECT ORIENTED DATABASES 9

Introduction to Object Oriented Data Bases – Approaches – Modeling and Design – Persistence – Transaction – Concurrency – Recovery – Database Administration

UNIT III EMERGING SYSTEMS 9

Enhanced Data Models – Client/Server Model – Data Warehousing and Data Mining – Web Databases – Mobile Databases

UNIT IV CURRENT ISSUES 9

Rules – Knowledge Bases – Active and Deductive Databases – Distributed Databases and Parallel databases

UNIT V DATABASE DESIGN ISSUES 9

Security – Integrity – Consistency – Database Tuning – Optimization and Research Issues

Total: 45 hrs.

TEXT BOOK

1. R. Elmasri and S.B. Navathe, Fundamentals of Database Systems, Addison Wesley, 2000.

REFERENCES

1. Gary W. Hanson and James V. Hanson, “Database Management and Design”, Prentice Hall of India, 1999.
2. Alex Benson, Stephen Smith and Kurt Thearling, “Building Data Mining Applications for CRM”, Tata McGraw Hill, 2000.

UNIT I FUNDAMENTALS 9

Software Process assessment overview – Assessment phases – Assessment principles – Assessment conduct – Implementation consideration – Quality management – Quality assurance plan – Considerations – Verification and Validation

UNIT II CONFIGURATION MANAGEMENT 9

Need for configuration Management – Software product nomenclature – Configuration management functions – Baselines – Responsibilities – Need for automated tools – Plan – SCM support functions – The requirement phase Design control – The implementation phase – Test phase – SCM Tools – Configuration accounting and audit

UNIT III SOFTWARE STANDARDS AND INSPECTION 9

Definitions – Reason for software standards – Benefits – Establishing standards – Guidelines – Types of reviews – Inspection of objectives – Basic inspection principles – The conduct of inspection – Inspection training

UNIT IV TESTING AND MANAGING SOFTWARE QUALITY 9

Testing: principles – Types – Planning – Development – Execution and reporting – Tools and methods – Real Time testing – Quality management paradigm – Quality motivation – Measurement criteria – Establishing a software quality program – Estimating software quality

UNIT V DEFECT PREVENTION 9

Principles of software defect prevention – Process changes for defect prevention – Defect prevention considerations – Managements role – Framework for software process change – Managing resistance to software process change – Case studies

Total: 45 hrs.

TEXT BOOK

1. Watts S. Humphrey, “Managing the software process”, Addison Wesley, 1999.

REFERENCES

1. Tsum S.Chow, “Software Quality Assurance a Practical Approach”, Sixth Edition, IEEE Computer Society press, 1985.
2. Richard E. Fairley, “Software Engineering A Practitioner’s approach”, Tata McGraw Hill, 1985.

UNIT I FUNDAMENTALS 10

Standards – Internet – History – OSI model – Protocol suite – Addressing – Transmission media – Local Area and Wide Area Networks – Switching – Connecting devices – IP addressing

UNIT II INTERNET PROTOCOL 10

Subnetting – Supernetting – IP packets – Delivery – Routing – Routing model – Routing table – Datagram – Fragmentation – Checksum – IP Design – ARP – RARP – Internet control message protocol – Internet group management protocol

UNIT III TRANSMISSION CONTROL PROTOCOL 8

User Datagram protocol – UDP operation – Use – UDP design – TCP services – Flow control – Error control – TCP operation and design – Connection – Transition diagram – Congestion control

UNIT IV APPLICATION LAYER AND CLIENT SERVER MODEL 8

Concurrency – BOOTP – DHCP – Domain name system – Name space – Distribution – Resolution – Messages – Telnet – Rlogin – Network Virtual Terminal – Character Set – Controlling the server – Remote login

UNIT V APPLICATION PROTOCOLS 9

File Transfer Protocol – Connections – Communication – Simple Mail Transfer Protocol – Simple Network Management Protocol – Hyper Text Transfer Protocol – Transaction – Request and Response messages

Total: 45 hrs.**TEXT BOOK**

1. Behrouz A. Forouzan, “TCP/IP Protocol Suite”, Tata McGraw Hill, 2000.

REFERENCE

1. Douglas E. Comer, David L. Stevens, “Internetworking with TCP/IP - Volume I - II and III”, Second Edition, Prentice Hall of India, 1994.

UNIT I FUNDAMENTALS 9

Characterization of Distributed Systems – Examples – Resource Sharing and the Web – Challenges – System Models – Architectural and Fundamental Models – Networking and Internetworking – Types of Networks – Network Principles – Internet Protocols – Case Studies

UNIT II PROCESSES AND DISTRIBUTED OBJECTS 9

Interprocess Communication – The API for the Internet Protocols – External Data Representation and Marshalling – Client-Server Communication – Group Communication – Case Study – Distributed Objects and Remote Invocation – Communication Between Distributed Objects – Remote Procedure Call – Events and Notifications – Java RMI – Case Study

UNIT III OPERATING SYSTEM ISSUES – I 9

The OS Layer – Protection – Processes and Threads – Communication and Invocation – OS Architecture – Security – Overview – Cryptographic Algorithms – Digital Signatures – Cryptography Pragmatics – Case Studies – Distributed File Systems – File Service Architecture – Sun Network File System – The Andrew File System

UNIT IV OPERATING SYSTEM ISSUES – II 9

Name Services – Domain Name System – Directory and Discovery Services – Global Name Service – X.500 Directory Service – Clocks– Events and Process States – Synchronizing Physical Clocks – Logical Time And Logical Clocks – Global States – Distributed Debugging – Distributed Mutual Exclusion – Elections – Multicast Communication Related Problems

UNIT V DISTRIBUTED TRANSACTION PROCESSING 9

Transactions – Nested Transactions – Locks – Optimistic Concurrency Control – Timestamp Ordering – Comparison – Flat and Nested Distributed Transactions – Atomic Commit Protocols – Concurrency Control in Distributed Transactions – Distributed Deadlocks – Transaction Recovery – Overview of Replication And Distributed Multimedia Systems

Total: 45 hrs.

TEXT BOOK

1. George Coulouris, Jean Dollimore and Tim Kindberg, “Distributed Systems Concepts and Design”, Third Edition, Pearson Education, 2002.

REFERENCES

1. Sape Mullender, “Distributed Systems”, Second Edition, Addison Wesley, 1993.
2. Albert Fleishman, “Distributed Systems Software Design and Implementation”, Springer Verlag, 1994.
3. M. L. Liu, “Distributed Computing Principles and Applications”, Pearson Education, 2004.
4. Andrew S Tanenbaum and Maarten van Steen, “Distributed Systems Principles and Paradigms”, Pearson Education, 2002.
5. Mughesh Singhal and Niranjana G Shivaratri, “Advanced Concepts in Operating Systems”, Tata McGraw Hill, 2001.

CA5010 DATA WAREHOUSING AND DATA MINING

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UNIT I BASIC CONCEPTS 9

Relation to Statistics – Databases – Data Mining Functionalities – Steps in Data Mining Process – Architecture of Typical Data Mining Systems – Classification of Data Mining Systems – Overview of Data Mining Techniques

UNIT II DATA PREPROCESSING AND ASSOCIATION RULES 9

Data Preprocessing – Data Cleaning – Integration – Transformation – Reduction – Discretization Concept Hierarchies – Concept Description: Data Generalization and Summarization Based Characterization – Mining Association Rules in Large Databases

UNIT III PREDICTIVE MODELING 9

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

UNIT IV DATA WAREHOUSING 9

Data Warehousing Components – Multi Dimensional Data Model – Data Warehouse Architecture – Data Warehouse Implementation – Mapping the Data Warehouse to Multiprocessor Architecture – OLAP – Need – Categorization of OLAP Tools

UNIT V APPLICATIONS 9

Applications of Data Mining – Social Impacts Of Data Mining – Tools – An Introduction to DB Miner – Case Studies – Mining WWW – Mining Text Database – Mining Spatial Databases

Total: 45 hrs.

TEXT BOOK

1. Jiawei Han and Micheline Kamber, “Data Mining: Concepts and Techniques”, Morgan Kaufmann Publishers, 2002.

REFERENCES

1. Alex Berson and Stephen J. Smith, “Data Warehousing, Data Mining & OLAP”, Tata McGraw Hill, 2004.
2. Usama M. Fayyad, Gregory Piatetsky, Shapiro, Padhrai Smyth and Ramasamy Uthurusamy, “Advances in Knowledge Discovery and Data Mining”, M.I.T Press, 1996.
3. Ralph Kimball, “The Data Warehouse Life Cycle Toolkit”, John Wiley & Sons Inc., 1998.
4. Sean Kelly, “Data Warehousing in Action”, John Wiley & Sons Inc., 1997.

CA5011 COMPONENT BASED TECHNOLOGIES

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UNIT I BASIC CONCEPTS 8

Definition – Industrialization of Software Development – CBD Drivers and Benefits – Technology Evolution – Components and Network Computing

UNIT II FUNDAMENTALS OF CBD 10

Basic concepts of CBD – Scenarios for CBD – Evolution or Revolution – Build – Find and use Components and Objects

UNIT III MODELS 10

Basic concepts of Object Models – Components and Interfaces – Working with Interfaces – Component and Interface modeling – Specification models – Domain modeling – Describing classes – Patterns and Frameworks

UNIT IV USING CBD 9

Categorizing and Deploying components – CORBA – DCOM

UNIT V FRAMEWORKS 8

Class Libraries – Encapsulated Components – Software Frameworks – Pre Built applications

Total: 45 hrs.

TEXT BOOK

1. Kuth Short, “Component Based Development and Object Modeling”, Sterling software, 1997.

REFERENCE

1. Clemens Szyperski, “Component software, Beyond object Oriented programming”, Addison Wesley, 2000.

UNIT I FUNDAMENTALS 9

Managerial Economics – Meaning – Nature and Scope – Managerial Economics and Business Decision Making – Role of Managerial Economist – Fundamental Concepts of Managerial Economics – Demand Analysis – Meaning – Determinants and types of demand – Elasticity of demand – Demand Function – Demand Curve – Estimation of the Demand Function

UNIT II SUPPLY-PRODUCTION AND COST ANALYSIS 9

Supply – Meaning and Determinants – Supply Function – Meaning of Production – Production Analysis: Long run and Short run – Production Functions – Isoquants – Expansion path – Cobb – Douglas Function. Cost Concepts – Cost – Output Relationship: Long run and Short run – Economies and Diseconomies of scale – Cost Functions – Estimation of Cost Function

UNIT III MARKET STRUCTURE AND PRICE DETERMINATION 9

Market structure – Perfect Competition – Monopoly – Monopolistic Competition – Oligopoly – Characteristics – Pricing of Goods and Services – Pricing and Output Decisions – Price Discrimination – Price Determinants – Profit Maximization and Free pricing – Methods of pricing – Differential pricing – Government intervention and pricing

UNIT IV PROFIT AND INVESTMENT ANALYSIS 9

Profit – Meaning and Nature – Profit Policies – Profit Planning and Forecasting – Cost Volume Profit Analysis – Investment Analysis – Meaning and Significance – Time Value of Money – Cash Flow and Measures of Investment Worth – Payback Period Criterion – Average rate of return criterion – Net present value criterion – Internal rate of return criterion – Profitability – Index criterion

UNIT V MACROECONOMIC ISSUE 9

National Income – Concepts – Determination of National Income – Business Cycle – Inflation and Deflation – Types of inflation – Causes of inflation – Balance of payments – Account – Assessing the balance of payments figures – Monetary and Fiscal Policies – Attitudes towards monetary policy – Problems of monetary policies – Nature of fiscal policy – Effectiveness of fiscal policy

Total: 45 hrs.

TEXT BOOK

1. G.S. Gupta “Managerial Economics”, Tata McGraw Hill, 1997.

REFERENCES

1. Joel Dean, “Managerial Economics”, Prentice Hall India, 1987.
2. Evan J. Douglas, “Managerial Economics”, Prentice Hall International, 1987.

UNIT I FUNDAMENTALS 9

Medium Access Control : Motivation for Specialized MAC – SDMA – FDMA – TDMA – CDMA – Comparison of Access Mechanisms – Tele communications : GSM – DECT – TETRA – UMTS – IMT-200 – Satellite Systems: Basics – Routing – Localization – Handover – Broadcast Systems: Overview – Cyclic Repetition of Data – Digital Audio Broadcasting – Digital Video Broadcasting

UNIT II WIRELESS NETWORKS 9

Wireless LAN – Infrared Vs Radio Transmission – Infrastructure Networks – Ad hoc Networks – IEEE 802.11 – HIPERLAN – Bluetooth – Wireless ATM – Working Group – Services – Reference Model – Functions – Radio Access Layer – Handover – Location Management – Addressing Mobile Quality of Service – Access Point Control Protocol

UNIT III MOBILE NETWORK LAYER 9

Mobile IP – Goals – Assumptions and Requirement – Entities – IP packet Delivery – Agent Advertisement and Discovery – Registration – Tunneling and Encapsulation – Optimization – Reverse Tunneling – IPv6 – DHCP – Ad hoc Networks

UNIT IV MOBILE TRANSPORT LAYER 9

Traditional TCP – Indirect TCP – Snooping TCP – Mobile TCP – Fast Retransmit/ Fast Recovery – Transmission/ Timeout Freezing – Selective Retransmission – Transaction Oriented TCP

UNIT V WAP 9

Architecture – Datagram Protocol – Transport Layer Security – Transaction Protocol – Session Protocol – Application Environment – Wireless Telephony Application

Total: 45 hrs.**TEXT BOOKS**

1. J.Schiller, “Mobile Communication”, Addison Wesley, 2000.
2. Charles Arehart, Shashikiran Guruprased, Alex Homer, Ric Howell, Stephan kasippillai, Rob Machin, Tom Myers, Alexander Nakhimovshy, Lucapassani, Chris pedley, Richard Taylor, Maroo Toschi, “Professional WAP”, Wrox Press, First Edition ,2000.

REFERENCES

1. William C. Y. Lee, “Mobile Communication Design Fundamentals”, John Wiley, 1993.
2. William Stallings, “Wireless Communication and Networks”, Pearson Education, 2003.
3. Singhal, “WAP - Wireless Application Protocol”, Pearson Education, 2003.

UNIT I DIGITAL IMAGE FUNDAMENTALS 9

Image Formation – Image Transforms – Fourier Transforms – Walsh – Hadamard – Discrete Cosine – Hotelling Transforms

UNIT II IMAGE ENHANCEMENT & RESTORATION 9

Histogram modification techniques – Image Smoothing – Image Sharpening – Image Restoration – Degradation Model – Noise Models – Spatial Filtering – Frequency Domain Filtering

UNIT III IMAGE COMPRESSION & SEGMENTATION 9

Compression Models – Elements of Information Theory – Error Free Compression – Image Segmentation – Detection of Discontinuities – Edge Linking and Boundary Detection – Thresholding – Region based Segmentation – Morphology

UNIT IV REPRESENTATION AND DESCRIPTION 9

Representation Schemes – Boundary Descriptors – Regional Descriptors – Relational Descriptors

UNIT V OBJECT RECOGNITION AND INTERPRETATION 9

Patterns and Pattern Classes – Decision – Theoretic Methods – Structural Methods

Total: 45 hrs.

TEXTBOOK

1. Gonzalez. R. C & Woods R. E., “Digital Image Processing”, Second Edition, Pearson Education, 2002.

REFERENCES

1. Anil Jain. K, “Fundamentals of Digital image Processing”, Prentice Hall of India, 1989.
2. Sid Ahmed, “Image Processing”, Tata McGraw Hill, 1995.

CA5015 ENTERPRISE RESOURCE PLANNING**L T P
3 0 0****UNIT I FUNDAMENTALS 9**

Integrated Management Information Seamless Integration – Supply Chain Management – Integrated Data Model – Benefits of ERP – Business Engineering and ERP – Definition of Business Engineering – Principle of Business Engineering – Business Engineering with Information Technology

UNIT II BUSINESS MODELLING FOR ERP 9

Building the Business Model – ERP Implementation – An Overview – Role of Consultant – Vendors and Users – Customisation – Precautions – ERP Post Implementation Options – ERP Implementation Technology –Guidelines for ERP Implementation

UNIT III ERP AND THE COMPETITIVE ADVANTAGE 9

ERP Domain MPGPRO – IFS/Avalon – Industrial and Financial Systems – Baan IV SAP – Market Dynamics and Dynamic Strategy

UNIT IV COMMERCIAL ERP PACKAGE 9

Description – Multi - Client Server Solution – Open Technology – User Interface – Application Integration

UNIT V ARCHITECTURE 9

Basic Architectural Concepts – The System Control Interfaces – Services – Presentation Interface – Database Interface

Total: 45 hrs.**TEXT BOOK**

1. Vinod Kumar Carg and N. K. Venkita Krishnan, “Enterprise Resource Planning - Concepts and Practice”, Prentice Hall of India, 1998.

REFERENCES

1. Jose Antonio Fernandz, “The SAP R/3 Handbook”, Tata McGraw Hill, 1998.

CA5016 AGENT BASED INTELLIGENT SYSTEMS**L T P
3 0 0****UNIT I BASIC CONCEPTS 9**

Definitions – Foundations – History – Intelligent Agents – Problem Solving – Searching – Heuristics – Constraint Satisfaction Problems – Game playing

UNIT II KNOWLEDGE REPRESENTATION AND REASONING 9

Logical Agents – First Order Logic – First Order Inference – Unification – Chaining – Resolution Strategies – Knowledge Representation – Objects – Actions – Events

UNIT III PLANNING AGENTS 9

Planning Problem – State Space Search – Partial Order Planning – Graphs – Nondeterministic Domains – Conditional Planning – Continuous Planning – MultiAgent Planning

UNIT IV AGENTS AND UNCERTAINTY 9

Acting under uncertainty – Probability Notation – Bayes Rule and Use – Bayesian Networks – Other Approaches – Time and Uncertainty – Temporal Models – Utility Theory – Decision Network – Complex Decisions

UNIT V HIGHER LEVEL AGENTS 9

Knowledge in Learning – Relevance Information – Statistical Learning Methods – Reinforcement Learning – Communication – Formal Grammar – Augmented Grammars – Future of AI

Total: 45 hrs.

TEXT BOOK

1. Stuart Russell and Peter Norvig, “Artificial Intelligence A Modern Approach”, Second Edition, Prentice Hall, 2002.

REFERENCES

1. Michael Wooldridge, “An Introduction to Multi Agent System”, John Wiley, 2002.
2. Patrick Henry Winston, “Artificial Intelligence”, Third Edition, Addison Wesley, 1999.
3. Nils.J.Nilsson, “Principles of Artificial Intelligence”, Narosa Publishing House, 1992.

UNIT I FUNDAMENTALS 9

Speech and Language Processing – Ambiguity – Models and algorithms – Language – Thought – Understanding – Brief history – Regular Expressions – Automata – Morphology and Finite State Transducers – Computational Phonology and Text to Speech

UNIT II PROBABILISTIC MODELS AND SPEECH RECOGNITION 10

Spelling – Bayesian Method – Weighted Automata – N-grams – Smoothing – Entropy – HMMs and Speech Recognition – Speech Recognition Architecture – Hidden Markov Models – Decoding – Acoustic Processing – Speech Recognizer – Speech Synthesis

UNIT III SYNTAX 8

Word Classes and Part of Speech Tagging – Tagsets – Transformation based tagging – Context free Rules and Trees – The Noun Phrase – Co-ordination – Verb Phrase – Finite State and Context free Grammars – Parsing with Context free Grammars

UNIT IV UNIFICATION AND PROBABILISTIC PARSING 8

Features – Implementing Unification – Unification Constraints – Probabilistic Context free Grammars – Problems – Lexicalized Context free Grammars – Dependency Grammars – Human Parsing – Language and Complexity

UNIT V SEMANTICS 10

Representing Meaning – First order Predicate Calculus – Semantic Analysis – Attachments – Idioms – Compositionality – Robust Semantic Analysis – Lexical Semantics – Selectional Restrictions – Machine Learning Approaches – Dictionary based Approaches – Information Retrieval

Total: 45 hrs.

TEXT BOOK

1. Daniel Jurafsky and James H. Martin, “Speech and Language Processing”, Pearson Education, 2002.

REFERENCES

1. Michael W. Berry, “Survey of Text Mining, Clustering, Classification and Retrieval Systems”, Springer Verililag, 2003.
2. James Allen, “Natural Language Understanding”, Benjamin Cummings Publishing, 1995.

UNIT I AGENT AND USER EXPERIENCE 9

Interacting with Agents – Agent from Direct Manipulation to Delegation – Interface Agent Metaphor with Character – Designing Agents – Direct Manipulation versus Agent Path to Predictable

UNIT II AGENTS FOR LEARNING IN INTELLIGENT ASSISTANCE 9

Agents for Information Sharing and Coordination – Agents that Reduce Work Information Overhead – Agents without Programming Language – Life like Computer character – S/W Agents for Cooperative Learning – Architecture of Intelligent Agents

UNIT III AGENT COMMUNICATION AND COLLABORATION 9

Overview of Agent Oriented Programming – Agent Communication Language – Agent Based Framework of Interoperability

UNIT IV AGENT ARCHITECTURE 9

Agents for Information Gathering – Open Agent Architecture – Communicative Action for Artificial Agent

UNIT V MOBILE AGENTS 9

Mobile Agent Paradigm – Mobile Agent Concepts – Mobile Agent Technology – Case Study: Tele Script – Agent Tel

Total: 45 hrs.

TEXT BOOKS

1. Jeffrey M. Bradshaw, “Software Agents”, MIT Press, 2000.
2. William R. Cockayne and Michael Zyda, “Mobile Agents”, Prentice Hall of India, 1998

REFERENCES

1. Russel and Norvig, “Artificial Intelligence: A Modern Approach”, Second Edition, Prentice Hall, 2002.
2. Joseph P. Bigus and Jennifer Bigus, “Constructing Intelligent agents with Java, A Programmer's Guide to Smarter Applications”, Wiley, 1997.

UNIT I BASIC CONCEPTS 9

Introduction to Supply Chain Management (SCM) – Concept of SCM – Components of SCM – An Overview – Features of SCM – Strategic issues in SCM – Systems View – SCM current scenario – Value Chain Management and Customer Relations Management

UNIT II INTERFACES WITH OTHER DISCIPLINES 10

Marketing and Supply Chain Interface – Customer focus in SCM – Demand planning – Purchase planning – Make or Buy decision – Indigenous and Global Sourcing – Development and Management of suppliers – Legal aspects of buying – Cost Management – Negotiating for purchasing/subcontracting – Purchase Insurance – Evaluation of purchase performance (performance indices) Inventory Management – Finance and Supply Chain Interface Financial impact of Inventory

UNIT III MANUFACTURING AND WAREHOUSING 9

Manufacturing scheduling – Manufacturing flow system – Work flow automation – Flexibility in manufacturing to achieve dynamic optimization – Material handling system design and decision Warehousing and store keeping – strategies of warehousing and storekeeping – space management

UNIT IV LOGISTICS MANAGEMENT 8

Logistics management – Role of logistics in SCM – Integrated Logistics management – Transportation design and decision – Multi modalism – Third party logistics services and providers – Facilities management (port/airport.ICD’s) channels of distribution – Logistics and customer service

UNIT V INFORMATION TECHNOLOGY AND SCM 9

Information technology and SCM – EDI – ERP – Internet and Intranet – E-Commerce – Bar coding – Telecommunication Network – Advanced planning system – Decision support models for Supply Chain Management – Artificial Intelligence for SCM – Best practice in supply chain management – Organizational issues to implement SCM

Total: 45 hrs.

TEXT BOOK

1. B.S.Sahay, “Supply chain management for global competitiveness”, Macmillan India Limited, 2000.

REFERENCES

1. Donald J. Bowersox and David J. Closs, “Logistical Management”, Tata McGraw Hill, 2000.
2. David Simchi Levi, “Designing and managing the supply chain”, Tata McGraw Hill, 2000.

UNIT I EMBEDDED COMPUTING

Challenges of Embedded Systems – Embedded system design process – Embedded processors – ARM processor – Architecture, ARM and Thumb Instruction sets

UNIT II EMBEDDED C PROGRAMMING 9

C-looping structures – Register allocation – Function calls – Pointer aliasing – Structure arrangement – Bit fields – Unaligned data and endianness – Inline functions and inline assembly – Portability issues

UNIT III OPTIMIZING ASSEMBLY CODE 9

Profiling and cycle counting – Instruction scheduling – Register allocation – Conditional execution – Looping constructs – Bit manipulation – Efficient switches – Optimized primitives

UNIT IV PROCESSES AND OPERATING SYSTEMS 9

Multiple tasks and processes – Context switching – Scheduling policies – Interprocess communication mechanisms – Exception and interrupt handling – Performance issues

UNIT V EMBEDDED SYSTEM DEVELOPMENT 9

Meeting real time constraints – Multi-state systems and function sequences – Embedded software development tools – Emulators and debuggers – Design methodologies – Case studies – Complete design of example embedded systems

Total: 45 hrs.

TEXT BOOKS

1. Andrew N Sloss, D. Symes and C. Wright, "ARM system developers guide", Morgan Kaufman/ Elsevier, 2006.
2. Michael J. Pont, "Embedded C", Pearson Education, 2007.
3. Raj Kamal, "Embedded Systems: Architecture, Programming and Design, Tata McGraw-Hill, 2003

REFERENCES

1. Wayne Wolf, "Computers as Components: Principles of Embedded Computer System Design", Elsevier, 2006.
2. Steve Heath, "Embedded System Design", Elsevier, 2005.

UNIT I MONEY AND CAPITAL MARKETS 8

Trends of savings and financial flow – The Indian Money market – Introduction – Characteristics of money market – Need for money market – Major segments of money market – Money market instruments and Capital market – Introduction – Primary market and secondary market – Recent capital market reforms – New capital issue – Instruments and market participant

UNIT II STOCK EXCHANGES 10

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 8

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 10

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 hrs.**TEXT BOOK**

1. V. K. Bhalla, “Investment Management”, S. Chand & Company Ltd, 2003.

REFERENCES

1. Punithavathy Pandian, “Security Analysis & Portfolio Management”, Vikas Publishing House, 2001.
2. V. A. Avadhani, “Securities Analysis & Portfolio Management”, Himalay Publishing House, 1997.

UNIT I OVERVIEW

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

UNIT II FILE SUBSYSTEM 8

Internal representation of files: inodes – Structure of a regular file – Directories – Conversion of a path name to an inode – Super block – inode assignment to a new file – Allocation of disk blocks

UNIT III SYSTEM CALLS FOR THE FILE SYSTEM 10

Open – Read – Write – File and record locking – Adjusting the position of file I/O – Lseek – Close – File creation – Creation of special files – Changing directory, root, owner, mode – stat and fstat – Pipes – Dup – Mounting and unmounting file systems – Link – Unlink

UNIT IV PROCESSES 10

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

UNIT V MEMORY MANAGEMENT AND I/O 9

Memory Management Policies: Swapping – Demand paging – The I/O Subsystem: Driver Interface – Disk Drivers – Terminal Drivers – Streams – Inter process communication

Total: 45 hrs.

TEXT BOOK

1. Maurice J. Bach, “The Design of the Unix Operating System”, First Edition, Pearson Education, 1999.

REFERENCES

1. B. Goodheart and J. Cox, “The Magic Garden Explained”, Prentice Hall of India, 1986.
2. S. J. Leffler, M. K. McKusick, M. J. Karels and J. S. Quarterman., “The Design and Implementation of the 4.3 BSD Unix Operating System”, Addison Wesley, 1998.
3. Uresh Vahalia, “Unix Internals: The New Frontiers”, Pearson Education, 1996.

UNIT I FUNDAMENTALS OF TUNING

UNIT I INTRODUCTION TO MULTIPROCESSORS AND SCALABILITY ISSUES 9

Scalable design principles – Principles of processor design – Instruction Level Parallelism, Thread level parallelism – Parallel computer models – Symmetric and distributed shared memory architectures – Performance Issues – Multi-core Architectures – Software and hardware multithreading – SMT and CMP architectures – Design issues – Case studies – Intel Multi-core architecture – SUN CMP architecture

UNIT II PARALLEL PROGRAMMING 9

Fundamental concepts – Designing for threads – Threading and parallel programming constructs – Synchronization – Critical sections – Deadlock – Threading APIs

UNIT III OPENMP PROGRAMMING 9

OpenMP – Threading a loop – Thread overheads – Performance issues – Library functions – Solutions to parallel programming problems – Data races, deadlocks and livelocks – Non-blocking algorithms – Memory and cache related issues

UNIT IV MPI PROGRAMMING 9

MPI Model – Collective communication – Data decomposition – Communicators and topologies – Point-to-point communication – MPI Library

UNIT V MULTITHREADED APPLICATION DEVELOPMENT 9

Algorithms, program development and performance tuning

Total: 45 hrs.

TEXT BOOKS

1. Shameem Akhter and Jason Roberts, “Multi-core Programming”, Intel Press, 2006.
2. Michael J Quinn, Parallel programming in C with MPI and OpenMP, Tata McGraw Hill, 2003.

REFERENCES

1. John L. Hennessey and David A. Patterson, “ Computer architecture – A quantitative approach”, Fourth Edition, Morgan Kaufmann/Elsevier Publishers, 2007.
2. David E. Culler and Jaswinder Pal Singh, “Parallel computing architecture : A hardware/software approach” , Morgan Kaufmann/Elsevier Publishers, 1999.

CA5025 SERVICE ORIENTED ARCHITECTURE

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UNIT I SOA FUNDAMENTALS

Concepts of SOA – Service Oriented Enterprise – Service Oriented Architecture (SOA) – SOA and Web Services – Multi-Channel Access – Business Process management – Extended Web Services Specifications – Overview of SOA – Concepts – Key Service Characteristics – Technical Benefits – Business Benefits

UNIT II SOA AND WEB SERVICES

9

SOA and Web Services – Web Services Platform – Service Contracts – Service-Level Data Model – Service Discovery – Service-Level Security – Service-Level Interaction patterns – Atomic Services and Composite Services – Proxies and Skeletons – Communication – Integration Overview – XML and Web Services – .NET and J2EE Interoperability – Service-Enabling Legacy Systems – Enterprise Service Bus Pattern

UNIT III APPLICATIONS AND PRACTICAL CONSIDERATIONS

9

Multi-Channel Access – Business Benefits – SOA for Multi Channel Access – Tiers – Business Process Management – Concepts – BPM, SOA and Web Services – WS-BPEL – Web Services Composition

UNIT IV JAVA IMPLEMENTATION STANDARDS AND TOOLS

9

Java Web Services – JAX APIs – JAXP – JAX-RPC – JAXM – JAXR – JAXB

UNIT V MANAGEMENT AND SECURITY

9

Metadata Management – Web Services Security – Advanced Messaging – Transaction Management

Total: 45 hrs.

TEXT BOOKS

1. Eric Newcomer and Greg Lomow, “Understanding SOA with Web Services”, Pearson Education, 2005.
2. James McGovern, Sameer Tyagi, Michael E Stevens and Sunil Mathew, “Java Web Services Architecture”, Elsevier, 2003. (Unit 4)

REFERENCES

1. Thomas Erl, “Service Oriented Architecture”, Pearson Education, 2005.
2. Frank Cohen, “FastSOA”, Elsevier, 2007.
3. Scott Campbell and Vamsi Mohun, “Mastering Enterprise SOA”, Wiley, 2007.
4. Eric Pulier and Hugh Taylor, “Understanding Enterprise SOA”, Dreamtech Press, 2007.
5. Jeff Davies, “The Definitive Guide to SOA”, Apress, 2007.
6. Sandeep Chatterjee and James Webber, “Developing Enterprise Web Services”, Pearson Education, 2004.