

KONGU ENGINEERING COLLEGE, PERUNDURAI, ERODE - 638 052
(Autonomous)

MASTER OF COMPUTER APPLICATIONS
CURRICULUM

(For the candidates admitted from academic year 2014-15 onwards)

SEMESTER – I

Course Code	Course Title	Hours / Week			Credit	Maximum Marks		
		L	T	P		CA	ESE	Total
	THEORY							
14MCT11	Mathematical Foundation of Computer Applications	3	1	0	4	40	60	100
14MCT12	Accounting and Financial Management	3	0	0	3	40	60	100
14MCT13	Digital Principles	3	0	0	3	40	60	100
14MCT14	Problem Solving Techniques	3	0	0	3	40	60	100
14MCT15	Programming in C	3	1	0	4	40	60	100
	PRACTICAL							
14MCL11	Programming in C Laboratory	0	0	3	1	100	0	100
14MCL12	Linux Scripting Laboratory	0	0	3	1	100	0	100
14MCL13	English Language Skills Laboratory	0	0	3	1	100	0	100
Total					20			

CA – Continuous Assessment, ESE –End Semester Examination

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SEMESTER – II

Course Code	Course Title	Hours / Week			Credit	Maximum Marks		
		L	T	P		CA	ESE	Total
	THEORY							
14MCT21	Probability and Statistical Methods	3	1	0	4	40	60	100
14MCT22	Principles of Management	3	0	0	3	40	60	100
14MCT23	Object Oriented Programming	3	1	0	4	40	60	100
14MCT24	Web Designing	3	0	0	3	40	60	100
14MCT25	Computer Organization and Architecture	3	0	0	3	40	60	100
	PRACTICAL							
14MCL21	Object Oriented Programming Laboratory	0	0	3	1	100	0	100
14MCL22	Web Designing Laboratory	0	0	3	1	100	0	100
14MCL23	Communication Skills and Personality Development Laboratory	0	0	3	1	100	0	100
Total					20			

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SEMESTER – III

Course Code	Course Title	Hours / Week			Credit	Maximum Marks		
		L	T	P		CA	ESE	Total
	THEORY							
14MCT31	Data Structures	3	0	0	3	40	60	100
14MCT32	Database Management Systems	3	1	0	4	40	60	100
14MCT33	Java Programming	3	0	0	3	40	60	100
14MCT34	Operating Systems	3	1	0	4	40	60	100
14MCT35	Software Engineering	3	0	0	3	40	60	100
	PRACTICAL							
14MCL31	Data Structures Laboratory	0	0	3	1	100	0	100
14MCL32	RDBMS Laboratory	0	0	3	1	100	0	100
14MCL33	Java Programming Laboratory	0	0	3	1	100	0	100
Total					20			

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SEMESTER – IV

Course Code	Course Title	Hours / Week			Credit	Maximum Marks		
		L	T	P		CA	ESE	Total
	THEORY							
14MCT41	Computer Networks	3	0	0	3	40	60	100
14MCT42	Object Oriented Analysis and Design	3	0	0	3	40	60	100
14MCT43	Advanced Java Programming	3	0	0	3	40	60	100
	Elective – I (Professional)	3	0	2	4	40	60	100
	Elective – II (Open)	3	0	0	3	40	60	100
	PRACTICAL							
14MCL41	Network and Operating Systems Programming Laboratory	0	0	3	1	100	0	100
14MCL42	Advanced Java Programming Laboratory	0	0	3	1	100	0	100
14MCP41	Mini Project I	0	0	4	2	50	50	100
Total					20			

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SEMESTER – V

Course Code	Course Title	Hours / Week			Credit	Maximum Marks		
		L	T	P		CA	ESE	Total
	THEORY							
14MCT51	Open Source Technology	3	0	0	3	40	60	100
14MCT52	Software Testing	3	0	0	3	40	60	100
14MCT53	Cloud Computing	3	0	0	3	40	60	100
	Elective - III (Professional)	3	0	0	3	40	60	100
	Elective - IV (Open)	3	0	0	3	40	60	100
	PRACTICAL							
14MCL51	Open Source Technology Laboratory	0	0	3	1	100	0	100
14MCL52	Software Testing Laboratory	0	0	3	1	100	0	100
14MCP51	Mini Project II	0	0	4	2	50	50	100
Total					19			

CA – Continuous Assessment, ESE – End Semester Examination

SEMESTER – VI

Course Code	Course Title	Hours/ Week			Credit	Maximum Marks		
		L	T	P		CA	ESE	Total
14MCP61	Project Work	0	0	24	12	100	100	200
Total					12			

CA – Continuous Assessment, ESE – End Semester Examination

Total Credits: 111

LIST OF PROFESSIONAL ELECTIVES					
Course Code	Course Title	Hours/Week			Credit
		L	T	P	
SEMESTER IV					
14MCE01	XML and Web Services	3	0	2	4
14MCE02	C# and ASP.NET	3	0	2	4
14MCE03	Data Mining	3	0	2	4
14MCE04	Design and Analysis of Algorithms	3	0	2	4
14MCE05	Computer Graphics	3	0	2	4
14MCE06	Distributed Systems	3	0	2	4
14MCE07	Design Patterns	3	0	2	4
SEMESTER V					
14MCE08	TCP / IP	3	0	0	3
14MCE09	Big Data Analytics	3	0	0	3
14MCE10	Information Security	3	0	0	3
14MCE11	Software Project Management	3	0	0	3
14MCE12	Mobile and Pervasive Computing	3	0	0	3
14MCE13	Soft Computing	3	0	0	3
14MCE14	Theory of Computation	3	0	0	3

LIST OF OPEN ELECTIVES					
Course Code	Course Title	Hours/Week			Credit
		L	T	P	
SEMESTER IV					
14MCO01	Business Intelligence and its Applications	3	0	0	3
14MCO02	Mobile Application Development	3	0	0	3
SEMESTER V					
14MCO03	Digital Image Processing	3	0	0	3
14MCO04	Linux Administration	3	0	0	3

14MCT11 MATHEMATICAL FOUNDATION OF COMPUTER APPLICATIONS

3 1 0 4

UNIT – I 9

Basic Set Theory: Basic Concepts – Power set, Cartesian product, Venn diagram and Set operations – Laws of set theory – Principle of inclusion and exclusion - Partitions.

UNIT – II 9

Relations and Functions: Relations – Properties of relations – Matrices of relations – Closure operations on relations – Functions – Injective, Surjective and bijective functions – Compositions of functions – Identity – Inverse functions.

UNIT – III 9

Mathematical Logic: Propositions and logical operations – Truth table- Equivalence - Implication – Basic laws – Proofs in propositional calculus – Predicates – Variables – Quantifiers – Inference in predicate calculus – Mathematical Induction.

UNIT – IV 9

Formal Languages: Languages and Grammars – Phrase Structure Grammar – Classification of Grammars – Pumping Lemma for Regular Languages (Statement and Simple Problems) – Context Free Languages.

UNIT – V 9

Finite State Automata and PDA: 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, PDA - Equivalence of acceptance by final state and empty stack - Equivalence of PDA's and Context Free Languages.

Lecture: 45, Tutorial:15, TOTAL: 60

REFERENCE BOOKS:

1. Kenneth H. Rosen, “Discrete Mathematics and Its Applications”, Tata McGraw Hill, Fourth Edition, 2002.
2. Hopcroft and Ullman, “Introduction to Automata Theory, Languages and Computation”, Narosa Publishing House, Delhi, 2002.
3. Tamilarasi A. and Natarajan A.M., “Discrete Mathematics and its Application”, Khanna Publishers, Second Edition, 2005.

Course Outcomes:

On completion of the course the students will be able to

- perform operations on discrete structures such as sets, relations and functions
- synthesize induction hypotheses and simple induction proofs
- verify the correctness of an argument using propositional and predicate logic
- apply the concept of formal languages to programming language design and is at the heart of modern compiler architectures
- acquire knowledge in automata theory that contributes the concept of regular expressions, used in pattern matching

14MCT12 ACCOUNTING AND FINANCIAL MANAGEMENT

3 0 0 3

UNIT– I 9

Financial Accounting: Meaning and Scope of Financial Accounting – Classifications of Accounts – Fundamental Concepts and Conventions – Accounting Cycle – Preparation of Journal, Ledger, Trial Balance, Trading Account, Profit and Loss Account and Balance Sheet.

UNIT II 9

Ratio Analysis: Ratio Analysis: Introduction to Financial Statement analysis – Ratio Analysis: Classification of Ratios – Advantages and Limitations of Ratio Analysis.

UNIT III 9

Cost Accounting: Cost Accounting: Meaning and Objectives – Classification of Cost – Elements of Costs – Preparation of Cost Sheet.

UNIT IV 9

Budgetary Control: Budgetary Control: Meaning – Types of Budgets – Flexible Budget, Cash Budget and Functional Budgets: Preparation and Interpretation. Introduction to Master Budget and Zero Based Budget.

UNIT – V 9

Financial Management: Financial Management: Introduction – Objectives and Functions – Risk-Return relationship – Time Value of Money concepts (Discounting and Compounding Techniques).

TOTAL: 45

REFERENCE BOOKS:

1. S.N.Maheswari, Suneel K Maheswari, Sharad K Maheswaeri, “A Text Book of Accounting for Management”, Vikas Publishing House Pvt Ltd., 2013.
2. T.Vijaya Kumar, “Accounting For management”, McGraw Hill, 2010.
3. M.Y.Khan, P.K. Jain, “Management Accounting, Text, Problems and cases”, McGraw Hill, 2012.
4. Pandey, I M., “Financial Management”, Tenth Edition, Vikas Publishing House, New Delhi, 2010

Course Outcomes:

On completion of the course the students will be able to

- attain the skills to prepare the financial statements namely trading, profit and loss account and balance sheet
- obtain the knowledge to prepare the cost statement
- gain the skills to prepare the various budgets
- acquire the knowledge on basic concepts of financial management
- express the idea of investment planning with expected risk and return and time value of money

UNIT – I **9**

Number Systems and Boolean Algebra: Binary Systems and Binary Numbers: Digital Systems - Binary Numbers - Number Base Conversions - Octal and Hexadecimal Numbers – Complements - Signed Binary Numbers - Binary Codes - Binary Storage and Registers - Binary Logic. Boolean Algebra and Logic Gates: Basic Theorems and Properties of Boolean Algebra - Boolean Functions - Canonical and Standard Forms - Digital Logic Gates.

UNIT – II **9**

Minimization and Combinational Logic: Minimization: K-Map Method – Table Method - POS – SOP - Don't Care Conditions - NAND, NOR Implementation - Combinational Logic: Combinational Circuits - Analysis and Design Procedure - Binary Adder, Subtractor - Decimal Adder - Binary Multiplier - Magnitude Comparator – Decoders – Encoders - Multiplexers.

UNIT – III **9**

Synchronous Sequential Logic: Synchronous Sequential Logic: Sequential Circuits – Latches - Flip-Flops - Analysis of Clocked Sequential Circuits - State Reduction and Assignment Design Procedure.

UNIT – IV **9**

Registers and Counters: Registers and Counters: Registers - Shift Registers - Ripple Counters - Synchronous Counters - Ring Counters-Johnson Counter.

UNIT – V **9**

Asynchronous Sequential Circuit: Asynchronous Sequential Circuit: Introduction - Analysis Procedure - Circuits with Latches - Design Procedure - Reduction of State and Flow Tables - Race – Free State Assignment Hazards - Design Example.

TOTAL: 45**REFERENCE BOOKS:**

1. Morris Mano M., “Digital Design”, Fourth Edition, Pearson Education, Delhi, 2011.
2. Donald P Leech, Albert Paul Malvino and Goutam Saha, “Digital Principles and Applications”, Seventh Edition Tata McGraw-Hill Education Pvt. Ltd. , 2010.
3. Floyd Thomas L., “Digital Fundamentals”, 10th Edition, UBS, 2008.

Course Outcomes:

On completion of the course the students will be able to

- perform arithmetic operations in any number system
- simplify the boolean expression using K-Map and Tabulation techniques
- use boolean simplification techniques to design a combinational hardware circuit
- design and analyze a given digital circuit
- construct various asynchronous sequential circuit

UNIT-I

9

Computer Problem Solving and Fundamental Algorithm: Introduction – Problem-Solving Aspect - Top-Down Design - Implementation of Algorithms - Program Verification - Efficiency of Algorithms. Fundamental Algorithms: Exchanging the Values of Two Variables – Counting - Summation of a Set of Numbers - Factorial Computation - Sine Function Computation - Generation of the Fibonacci Sequence - Reversing the Digits of an Integer - Base Conversion - Character to Number Conversion.

UNIT-II

9

Factoring Methods: Finding the Square Root of a Number -The Smallest Divisor of an Integer - The Greatest Common Divisor of Two Integers - Generating Prime Numbers - Computing the Prime Factors of an Integer - Generation of Pseudo Random Numbers - Raising a Number to a Large Power.

UNIT-III

9

Array Techniques: Array Order Reversal- Histogramming - Finding the Maximum Number in a Set - Removal of Duplicates from an Ordered Array - Partitioning an Array - Finding the Kth Smallest Element – Longest Monotone Subsequence.

UNIT-IV

9

Sorting and Searching: Sorting: The Two-Way Merge - Sorting by Selection - Sorting by Exchange - Sorting by Insertion - Sorting by Diminishing Increment - Sorting by Partitioning. Searching: Binary Search - Hash Searching.

UNIT-V

9

Text Processing and Pattern Searching: Text Line Length Adjustment - Left and Right Justification of Text - Keyword Searching in Text - Text Line Editing - Linear Pattern Search - Sub Linear Pattern Search.

TOTAL: 45

REFERENCE BOOKS:

1. Dromey,R.G., “How to Solve it by Computer”, First edition, Pearson Education, India, 2007.
2. Seymour Lipschutz, “Essentials Computer Mathematics”, Schaums’ Outlines Series, Tata McGraw Hill, 2004.
3. Jeri Hanly and Elliot Koffman, “Problem Solving and Problem Design in C”, Sixth Edition, Addison Wesley, 2011.

Course Outcomes:

On completion of the course the students will be able to

- identify and design a computational and valid potential solution for a given problem
- break a problem into logical modules that can be solved easily
- implement suitable sorting and searching technique for given applications
- design unique algorithms
- understand the concepts of text processing and pattern matching

UNIT-I**9**

Introduction to C Programming: Introduction to C - Types of programming languages Desirable Program Characteristics – Identifiers - Keywords - Data Types - Constants - Variables - Operators and Expressions - Data Input and Output – Formatted I/O – Control Statements.

UNIT-II**9**

Functions and Arrays: Functions - Recursion – Storage Class - Arrays: One dimensional Arrays Multidimensional Arrays – Strings.

UNIT-III**9**

Pointers: Concepts - Pointers and Function: Passing Pointer to a Function - Function Pointers - Pointers and Arrays: Array of Pointers - Pointer to an Array - Dynamic Memory Allocation.

UNIT-IV**9**

User Defined Data Types: User Defined Data Types: typedef Statement - Structures and Unions: Definition - Structures and Arrays - Structures and Function - Structures and Pointers - Nested Structures – Self-referential Structures – Union.

UNIT-V**9**

Files and Preprocessor: File Operations - File I/O – Sequential File - Random Access - Binary files – Bit Fields - Enumerations- Command Line Arguments - Macros - C Preprocessor.

Lecture:45, Tutorial:15, TOTAL: 60**REFERENCE BOOKS:**

1. Byron Gottfried, “Programming with C”, Third edition, Tata McGraw Hill, Education Private Ltd., New Delhi, 2011.
2. Dennis Ritchie.M, Brain Kernighan. W, “The C Programming Language “, Second Edition, Prentice Hall of India, New Delhi, 1998.
3. Yashavant P. Kanetkar, “Let Us C”, Twelveth Edition, BPB Publications, 2012.
4. Schildt Herbert, “C: Complete Reference”, Fourth Edition, Tata McGraw-Hill, New Delhi, 2000.

Course Outcomes:

On completion of the course the students will be able to

- learn, analyze and understand the logical structure of a computer program and different ways to develop a program in ‘C’ language
- transform a problem to a program and improve the logical ability through operators and control structures
- write small programs related to simple/moderate mathematical, and logical problems in ‘C’
- construct the programs using array, structure and files
- implement the modularity concepts using function and pointers
- study, analyze and understand simple data structures, use of pointers, memory allocation and data handling through files in ‘C’

LIST OF EXPERIMENTS:

1. Implement programs on Input and Output Functions
2. Design programs on Control Structures
3. Develop programs on Arrays and Multidimensional Arrays
4. Design programs to handle Strings
5. Implement programs on Functions
6. Design programs on Recursions
7. Develop programs to handle Pointers
8. Implement programs to manage Dynamic Memory allocation
9. Implement programs to create and manage the Structures and Unions
10. Develop programs to handle Files
11. Implement programs on Preprocessors
12. Implement programs on Command Line Arguments

Implement in Linux Environment**TOTAL: 45****REFERENCES / MANUALS / SOFTWARE:**

1. Byron Gottfried, "Programming with C", Third Edition, Tata McGraw Hill Education Private Ltd., New Delhi, 2011.
2. Yashavant Kanetkar, "Understanding Pointers in C", Fourth Edition, BPB Publications, 2009.
3. Yashavant Kanetkar, "Test Your C Skills", Fourth Edition, BPB Publications, 2005.

Course Outcomes:

On completion of the course the students will be able to

- implement program using control structures and looping
- handle arrays and strings
- store data in memory effectively using function, pointers and files

LIST OF EXPERIMENTS:

1. Basic commands in linux.
2. Write a program using shell script.
3. Implement pipe and filter commands in shell script.
4. Program using utilities.
5. Write a program to sort an array using shell script.
6. Program for manipulating strings in shell script.
7. Write a program for directory operations using shell script.
8. Write a program for file manipulation using shell script.
9. Write a shell script to assign and remove file permission using symbolic notation for a group, user and others.
10. Write a shell script to assign and remove file permission using octal notation for a group, user and others.
11. Program using ruby script.
12. Write a program using awk script.

TOTAL: 45**REFERENCES / MANUALS / SOFTWARE:**

1. M.G.Venkateshmurthy, "Introduction to unix and shell programming", Pearson Education, 2006.
2. Brain Marick, "Everyday scripting with ruby", Pragmatic Programmers LLC, 2007.

Course Outcomes:

On completion of the course the students will be able to

- understand open source linux operating system
- obtain programming knowledge in shell, ruby and AWKscript
- create scripts that will execute automatically in the linux environment

LIST OF EXPERIMENTS:**Computer Lab : System based Learning**

1. **Listening Skills:** Listening activity using software package in the communication laboratory, Types of Listening – Process of Listening – Modes of Listening – Implications of effective Listening activities

Audio Visual Lab : Activity based Learning

2. **Activity based Reading Skills:** Mechanics of reading – Skimming / scanning/ identifying the main idea
3. **Activity based Writing Skills:** Letter Writing : Writing Personal and Formal Letters – Writing and sending e-mails
4. **Speaking Skills:** Describing and introducing ideas - Opening a conversation and getting acquainted with people - Conversation practice in real life situations - Role Play

Career Lab

5. a. **Reading skills:** Reading a Text - identifying the main idea – Cloze Exercise
- b. **Speaking Skills:** Describing Objects, Persons, Places
- c. **Role Play:** Guided Role Play – Role Play with a partner
- d. **Formal Letter Writing:** Writing leave letter and Permission letter – Business correspondence – e-mail

TOTAL: 45**REFERENCES / MANUALS / SOFTWARE:**

1. Communication Software Package: Orell Digital Language Lab Software

Course Outcomes:

On completion of the course the students will be able to

- speak clearly, confidently, comprehensibly and communicate with others using appropriate communicative strategies
- write cohesively, coherently and flawlessly, avoiding grammatical errors, using the right format and organizing their ideas logically on a topic
- read different genres of texts adopting various reading strategies
- listen /view and comprehend different spoken discourses / excerpts

14MCT21 PROBABILITY AND STATISTICAL METHODS

3 1 0 4

UNIT – I 9

Basic Statistics: Measures of central tendency: Arithmetic mean - Median and mode - Measures of dispersion: Quartile deviation - Mean deviation - Standard deviation and Coefficient of variation for grouped and ungrouped data - Skewness - Karl Pearson coefficient of skewness - Correlation – Karl Pearson coefficient of Correlation - Rank correlation.

UNIT – II 9

Probability: Random experiment - Sample space and events - Definitions of probability - Addition and multiplication rules of probability - Conditional probability and Bayes theorem - Random variables –Discrete and continuous (univariate data) - Probability mass functions and probability density functions - Expectation and variance.

UNIT– III 9

Discrete Distributions: Binomial - Poisson distributions and their properties (Definition, mean, variance, moment generating function, Additive properties, fitting of the distribution). **Continuous distributions:** Normal - Exponential distributions and their properties - Curve fitting using Principle of Least Squares.

UNIT– IV 9

Statistical Inference: Test of Hypothesis – Means and proportions – Hypothesis concerning one and two means – Type I and Type II errors - One tail, two-tail tests - Tests of significance – Student's t-test, F-test.

UNIT – V 9

Analysis of Variance: Assumptions in Analysis of variance - Technique of analysis of variance – one way classification - two way classification - χ^2 -test and goodness of fit.

Lecture: 45, Tutorial:15, TOTAL:60

REFERENCE BOOKS:

1. S.C. Gupta, “Fundamentals of Statistics”, Sixth Revised Edition, Himalaya Publications, 2004.
2. Kishore S. Trivedi, “Probability and Statistics with Reliability, Queuing and Computer Applications”, Prentice Hall of India ,1999
3. S.P.Gupta, ‘Statistical Methods’, Sultan Chand and Sons, Educational publishers, 37th Edition, 2009.

Course Outcomes:

On completion of the course the students will be able to

- collect and analyze the data statistically
- know the importance and applications of averages and standard deviation
- use and apply the probability concepts, distributions and to fit a straight line to data, and to perform transformations when necessary
- estimate unknown parameters of the population from a sample
- select and apply appropriate methods for carrying out statistical inference and analysis of variance

14MCT22 PRINCIPLES OF MANAGEMENT

3 0 0 3

UNIT – I

9

Management Overview: Evolution of Management Thought - Process of Management- Approaches to Management-Management Roles and functions. External Environmental and Social Responsibility – Ethics in managing.

UNIT – II

9

Planning: Meaning importance of Planning - Steps in Planning - Types of Plans – Objectives - Management by Objectives (MBO) – Strategies - Policies and Planning Premises.

UNIT – III

9

Organizing: Meaning – Formal and informal organization – Organization Structure – Departmentation - Authority and Span of Control- Delegation and Decentralization - Line and Staff Relationship.

UNIT - IV

9

Staffing: Sources of Recruitment - Selection Process - Communication process – Communication flow in the organization – Barriers and break downs in communication – Electronic media in communication.

UNIT - V

9

Leading: Ingredients of leadership – leadership behavior and styles – Controlling – Basic control process – Critical control points, standards and Benchmarking – Control techniques and information technology.

TOTAL: 45

REFERENCE BOOKS:

1. Harold Koontz And Heinz Weihrich "Essentials Of Management"-An International And Leadership Perspective-Tata Mcgraw Hill-9th Edition -2012.
2. Harold Koontz Heinz Weihrich A Ramachandra Aryasri, "Principles of management" MCGraw Hill Education 18th edition-2014.
3. Heinz Weihrich, Mark V. Cannice, Harold Koontz, "Management a Global Innovative and Entrepreneurial Perspective", McGraw Hill education, First Edition 2013.
4. Fundamentals Of Business-Jeff Madura-Cengage Learning-2012.

Course Outcomes:

On completion of the course the students will be able to

- acquire the knowledge of management principles
- identify planning requirements and strategies to frame the policies
- understand the controlling process and control techniques
- comprehend staffing parameters and have a clear idea about the recruitment process
- communicate effectively through oral and written presentations

14MCT23 OBJECT ORIENTED PROGRAMMING

3 1 0 4

UNIT – I 9

Object Oriented Programming: Object Oriented Paradigm – Structured Programming Versus Object Oriented Development – Basic Concepts - Arrays and Strings – Functions – Inline Functions – Functions with Default Arguments – References - Classes and Objects - Array of Objects.

UNIT – II 9

Constructors, Dynamic Objects, Static, Friend Function: Constructors – Destructors -Pointers to Objects - this Pointer - Dynamic Allocation Operators - Dynamic Objects - Static Data Members and Static Objects – Objects as Arguments – Returning Objects – Friend Function and Friend Class.

UNIT - III 9

Polymorphism and Inheritance: Overloading: Function and Operator overloading - Inheritance: Forms of Inheritance - Multilevel Inheritance - Multiple Inheritance - Hierarchical and Hybrid Inheritance - Virtual Functions - Pure Virtual Functions.

UNIT –IV 9

Exception Handling, Templates, I/O Streams: Exception Handling Fundamentals - Handling Derived Class Exceptions - Exception Handling Options -Template Functions and Template Classes - Streams: Stream Classes - Formatted and Unformatted Data - Manipulators - User Defined Manipulators.

UNIT -V 9

File Streams and STL: File Streams - File Pointer Manipulation - Sequential File Access - Random File Access – Namespaces - Standard Template Library: Overview - Container Class – Vectors - Lists – Maps - Algorithms - String Class.

Lecture: 45, Tutorial:15, TOTAL: 60

REFERENCE BOOKS:

1. Schildt. Herbert, “C++: The Complete Reference”, Fourth Edition, Tata McGraw-Hill, New Delhi, 2003.
2. Stroustrup, Bjarne, “The C++ Programming Language”, Fourth Edition, Addison Wesley, New York, 2013.
Venugopal, K.R.,Buyya, Rajkumar and Ravishankar, T., “Mastering C++”, Tata McGraw-Hill, New Delhi, 2006.
3. Hubbard, John R., “Schaum’s Outlines Programming with C++”, Second Edition, Tata McGraw- Hill, New Delhi, 2003.

Course Outcomes:

On completion of the course the students will be able to

- gain the knowledge in the area of object oriented programming
- explain class structures as fundamental, modular building blocks
- understand the role of inheritance, polymorphism, dynamic binding and generic structures in building reusable code
- prepare object-oriented design for small/medium scale problems
- write class components that protect data integrity and produce classes that are re-usable and maintainable design generic programs

14MCT24 WEB DESIGNING

3 0 0 3

9

UNIT – I

Introduction to WWW: Internet Standards - Introduction to WWW - WWW Architecture - Application servers - Browsers and Web servers - MIME types - URL - HTTP protocol - SMTP - POP3 - File Transfer Protocol - Introduction to Web development: Components of a web application - Static web pages - Dynamic web pages - Tools for web development - Web development issues - Web security.

UNIT – II

9

HTML: Structuring Documents for the Web: Basic Tags - Links and Navigation - Images, Audio and Video - Tables -Forms - Frames.

UNIT – III

Cascading Style Sheet: Introducing CSS - Properties - Selectors - Box model - Pseudo classes - Pseudo Elements - Visibility - Floating and Positioning - Page Layout - Design Issues.

UNIT– IV

9

Client Side Scripting: Java Script - Functions - Conditional Statements - Looping - Built-in Objects - Regular Expressions.

UNIT – V

9

DHTML: Document Object Model (DOM): Introduction - Modeling a Document: DOM Nodes and Trees - Traversing and Modifying a DOM Tree - DOM Collections - Dynamic Styles - Event Handling.

TOTAL: 45

REFERENCE BOOKS:

1. John Duckett, “Beginning HTML, XHTML, CSS, and JavaScript”, Second Edition, Wiley Publishing Inc, 2010.
2. Jennifer Niederst Robbins, “Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics”, Fourth Edition, O'Reilly Media, 2012.
3. Paul Deitel, Harvey Deitel, Abbey Deitel, “Internet and World Wide Web-How To Program, Fifth Edition”, Prentice Hall, 2012.
4. Zak Ruvalcaba , Anne Boehm,” Murach's HTML5 & CSS3 “, Mike Murach & Associates, Inc., 2012.

Course Outcomes :

On completion of the course the students will be able to

- understand the various steps in designing a creative and dynamic website
- write html, JavaScript and CSS
- gain clear understanding of hierarchy of objects in HTML document
- design dynamic and interactive web pages by embedding Java Script code in HTML
- use Java Script to validate user input

14MCT25 COMPUTER ORGANIZATION AND ARCHITECTURE

3 0 0 3

UNIT – I

9

Register Transfer, Micro Operations and Computer Organization: Register Transfer and Micro operations: Register Transfer Language – Transfer - Bus and Memory Transfer – Arithmetic – Logic - Shift Micro operations - Computer Organization: Instruction Codes – Registers – Instructions - Timing and Control - Instruction Cycle - Memory Reference Instructions - Input-Output and Interrupt.

UNIT - II

9

Central Processing Unit: Introduction - General Register Organization - Stack Organization - Instruction Formats, Addressing Modes - Data Transfer and Manipulation - Program Control - Reduced Instruction Set Computer(RISC).

UNIT - III

9

Pipeline and Vector Processing: Parallel Processing – Pipelining – Arithmetic – Instruction - RISC Pipeline - Vector Processing - Array Processors.

UNIT - IV

9

Input-Output Organization: Peripheral Devices – Input-Output Interface - Asynchronous Data Transfer - Modes of Transfer - Priority Interrupt - Direct Memory Access - Input-Output Processor - Serial Communication.

UNIT - V

9

Memory Organization: Memory Hierarchy - Main Memory – Auxiliary – Associative – Cache - Virtual Memory - Memory Management Hardware.

TOTAL: 45

REFERENCE BOOKS:

1. Morris Mano M., “Computer System Architecture”, Third Edition, Prentice Hall of India, NewDelhi, 2007.
2. Morris Mano M., “Digital Design”, Fourth Edition, Pearson Education, Delhi, 2011.
3. P.V.S Rao, “Computer System Architecture”, Prentice Hall of India, 2009.

Course Outcomes:

On completion of the course the students will be able to

- understand how computer hardware has evolved to meet the needs of multiprocessing systems
- apply knowledge of the processor’s internal registers and operations
- understand the major components of a computer including CPU, memory, I/O and storage
- understand dynamic scheduling methods and their adaptation to contemporary microprocessor design
- design a pipeline for consistent execution of instructions with minimum hazards

LIST OF EXPERIMENTS:**Using C++**

1. Write a program using inline functions, default function arguments
2. Develop applications using classes and objects, constructor and destructor
3. Design a class with static member function
4. Write a program using array of objects
5. Create a program using friend functions and friend class
6. Design applications using function overloading and operator overloading
7. Develop applications by implementing the concept inheritance
8. Use new and delete operators to implement dynamic memory allocation
9. Implement runtime polymorphism
10. Design function and class templates
11. Design a program using manipulators
12. Write a program using exception handling mechanism
13. Develop an application to implement file streams.
14. Write a program for manipulating string objects
15. Implement list, vectors and maps.

TOTAL: 45**REFERENCES / MANUALS / SOFTWARE:**

1. www.cplusplus.com
2. Herb Sutter, Andrei Alexandrescu, "C++ Coding Standards: 101 Rules, Guidelines, Best Practices", First Edition, Pearson Education Inc., 2005.
3. Schildt Herbert, "C++: The Complete Reference", Fourth Edition, Tata McGraw-Hill, New Delhi, 2003.

Course Outcomes:

On completion of the course the students will be able to

- differentiate between structures oriented programming and object oriented programming
- use object oriented programming language like C++ and associated libraries to develop object oriented programs
- apply concepts of operator-overloading, constructors , destructors exception handling and use built-in classes from STL

LIST OF EXPERIMENTS:

1. Design a web page using basic tags with frames.
2. Create a web page with the following
 - (i) To embed an image map in a web page
 - (ii) To fix the hot spots
 - (iii) To show all the related information when the hot spots are clicked.
3. Design a web page using different ways of implementing CSS.
4. Develop a web page using selectors, pseudo classes, pseudo elements and box model.
5. Write a java script program using built-in-objects (String, Array, Date, Math and Number Objects).
6. Write a java script program for arithmetic calculations.
7. Write a java script program to validate a form data using regular expression.
8. Write a java script program to traverse a HTML document using DOM.
9. Write a program to implement event handling in java script.
10. Write a program to display different HTML elements in a web page using collections.

TOTAL: 45**REFERENCES / MANUALS / SOFTWARE**

1. John Duckett, "Beginning HTML, XHTML, CSS, and JavaScript", Second Edition, Wiley Publishing Inc, 2010.
2. Paul Deitel, Harvey Deitel, Abbey Deitel, "Internet and World Wide Web-How To Program", Fifth Edition, Prentice Hall, 2012.

Course Outcomes:

On completion of the course the students will be able to

- understand, analyze and create web pages using HTML and Cascading Styles sheets
- create a fully functional website using DHTML
- create good, effective and customized websites

**14MCL23 COMMUNICATION SKILLS AND PERSONALITY DEVELOPMENT
LABORATORY**

0 0 3 1

LIST OF EXPERIMENTS:

Computer Lab : System based Learning

- 1 **Listening Skills :** Listening activity using software package in the communication laboratory,
 - listening to native speakers developing oral communication by imitating the model dialogues.Listening for specific information – listening to improve pronunciation – Listening and typing – Filling the blanks – TV programmes and News.

Audio Visual Lab : Activity based Learning

- 2 **Activity based Reading Skills:** Reading for getting information and understanding - Scanning,
 - skimming and identifying topic sentences – reading for gaining knowledge- Group activity.
- 3 **Activity based Writing Skills:** Preparing a draft – using Word Editing features, editing and proof reading - Writing a short essay using the draft prepared - Group activity – Professional report writing – Writing a job Application Letter.
- 4 **Speaking Skills:** Verbal and Non-Verbal Communication; Introducing oneself - Describing a place, Expressing views and opinions; Giving a presentation on a Topic- eye contact, speaking audibly, clearly and with confidence; Group discussion. Conversations – Face-to-Face conversation – Record a Telephonic Conversation.

Career Lab

- 5 a. **Interview skills:** Introducing oneself – Answering other FAQ's
 - b. **Presentation skills:** Elements and structure of effective presentation – Presentation Tools – PowerPoint Presentations – Voice Modulation – Body language – Video samples
 - c. **Group Discussion:** Structure of Group Discussion – Strategies in GD – Team work Video Samples
 - d. Preparing a Resume

TOTAL: 45

REFERENCES / MANUALS / SOFTWARE:

1. Communication Software Package: Orell Digital Language Lab Software.

Course Outcomes:

On completion of the course the students will be able to

- assess and articulate appropriate listening responses for a variety of situations/contexts
- identify and control anxiety in a variety of speaking situations/contexts
- analyze communication variables in personal, professional and community settings and adopt competent communication strategies

UNIT – I **9**
Stack, Queue and Linked List: Introduction to Data Structures – ADT – Arrays - Stack: Stack - Evaluation of Expressions. Queue: Linear Queue – Circular Queues. Linked List: Singly Linked Lists - Doubly Linked Lists - Circular Linked Lists.

UNIT – II **9**
Trees: Basic concepts – Binary tree - Properties – Representation – Binary Tree Traversals - Expression Trees – Binary Search Tree - AVL Trees – B Trees.

UNIT – III **9**
Graphs: Introduction - Representation - Elementary Graph Operations: Breadth First Search – Depth First Search - Connected Components – Bi-connected Components - Minimum Cost Spanning Trees: Prim’s and Kruskal’s - Shortest Paths: Dijkstra’s Algorithm.

UNIT – IV **9**
Sorting: Bubble Sort - Selection Sort – Shell Sort - Insertion Sort - Heap Sort - Radix Sort- Quick Sort - Merge Sort.

UNIT – V **9**
Searching: Sequential Search - Binary Search - Hashing: Hash Tables - Hash Functions - Separate Chaining - Open Addressing – Rehashing.

TOTAL: 45

REFERENCE BOOKS:

1. Ellis Horowitz, Sartaj Kumar Sahni, Susan Anderson-Freed, “Fundamentals of Data Structures in C”, 2nd Edition, Silicon Press, 2008.
2. Samanta Debasis, “Classic Data Structures”, 2nd Edition, Prentice Hall of India, 2010.
3. Weiss M. A., “Data Structures and Algorithm Analysis in C”, 3rd Edition, Pearson Education Asia, New Delhi, 2007.

Course Outcomes:

On completion of the course the students will be able to

- employ a deep knowledge of various data structures when constructing a program
- understand the abstract properties of various data structures such as stacks, queues, lists, trees and graphs
- choose an appropriate data structures to the specified problem definition
- implement suitable sorting and searching techniques for given applications
- apply various algorithm design techniques for any real world problems

UNIT – I **9**

Basic Concepts and Entity-Relationship Model: Introduction: Database System Applications – Purpose of Database Systems – View of Data – Database Architecture – Entity-Relationship Model – Constraints – Removing Redundant Attributes in Entity Sets -Entity-Relationship Diagrams– Example using ER Model – Issues - Enhanced E-R Features.

UNIT – II **9**

Relational Model and SQL: Introduction: Basic Relational Algebra Operations– Relational Database Design Using ER to Relational Mapping – Mapping EER model constructs to Relations - **SQL:** Creating and Managing Tables with Key Constraints (DDL, DML, DCL, TCL) – Joins - Sub Queries.

UNIT – III **9**

Normalization Concepts: Informal Design Guidelines - Functional Dependencies: Basic definition – Inference Rules – Equivalence of Sets and Minimal Sets of Functional Dependencies – Normal forms based on primary key - 1NF – 2NF – 3NF – Boyce - Codd.

UNIT – IV **9**

Indexing, Query Processing and Optimization: Indexing: Basic Concepts – Ordered Indices - Query Processing and Optimization: Overview - Measures of Query Cost – Evaluation of Expressions – Transformation of Relational Expressions.

UNIT – V **9**

Transaction Management and Recovery System: Transaction Concept – Properties - Transaction States- Serializability – Lock-Based Protocols – Recovery System: Failure Classification – Recovery and Atomicity.

Lecture:45, Tutorial:15, TOTAL:60

REFERENCE BOOKS:

1. Abraham Silberschatz, Henry F. Korth and S. Sudharshan, “Database System Concepts”, 6th Edition, Tata McGraw Hill, 2011.
2. Ramez Elamassri and Shankant B Navathe, “Fundamentals of Database Systems”, 6th Edition, Pearson Education Delhi, 2010.
3. Ivan Bayross, “SQL, PL/SQL The Programming Language of Oracle”, 4th Revised Edition, BPB Publications, 2010.
4. Date C.J., Kannan A., and Swamynathan S., “An Introduction to Database Systems”, 8th Edition, Pearson Education, 2006.

Course Outcomes:

On completion of the course the students will be able to

- learn about the framework of database management system and able to design ER model
- develop a database with normalization
- familiarize the query and transaction processing
- formulate, relational algebra and find solutions to a broad range of query problems
- understand the concept of query processing, optimization techniques and query cost evaluation

UNIT – I **9**

Java Basics: Overview of Java – Program Structure -Data Types, Variables, Arrays, Operators - Control Structures - Classes - Objects – Methods -Constructors- this keyword – finalize() method - Access Specifiers - Method Overloading - Constructor Overloading – Strings and String Buffers.

UNIT – II **9**

Inheritance, Packages and Interface: Inheritance: Member Access and Inheritance - Multilevel Hierarchy - Method Overriding – Dynamic Method Dispatch - Keywords: Abstract – Super - Final – Static - Packages: Defining a Package - Access Protection - Importing Packages. Interfaces: Defining an Interface - Implementing Interfaces.

UNIT – III **9**

Exception Handling, Multithreading and I/O Packages: Exception handling: Exception Types - Try and Catch statement – Throw – Throws – Finally. Multithreading: Single Thread Creation - Multiple Threads Creation, Thread Priorities – Synchronization – Deadlock - I/O Packages: Byte Streams - Character Streams.

UNIT – IV **9**

Collections Framework: Collection Interfaces: Set - Sorted Set – List – Queue - Deque - Collection Classes: Array List - Linked List- Hash Set – Priority Queue – Comparators.

UNIT – V **9**

Exploring Swing: Introduction to Swing – Components and Containers - Event Handling- JLabel and Image Icon – JText Field - Swing Buttons – JTabbed Pane - JList – JCombo Box – Trees - JTable.

TOTAL: 45**REFERENCE BOOKS:**

1. Schildt, Herbert, “The Complete Reference – Java 2“, 8th Edition, Tata McGraw Hill, New York, 2011.
2. Somasundaram. K., ”Programming in Java2”, 10th Edition, Jaico Publishing House, Mumbai, 2010.
3. Rajkumar Buyya, Thamarai Selvi S. and Xingchen Chu, “Object Oriented Programming with Java Essentials and Applications”, Tata McGraw Hill Publishing Company, New Delhi, 2011.

Course Outcomes:

On completion of the course the students will be able to

- understand the object oriented features of Java
- create user-defined package in java
- implement various data structure concept like queue, dequeue and linked list
- gain a strong foundation in GUI design using swing components
- implement collections framework in any real time applications

UNIT – I **9**

Introduction to Operating Systems: Computer System Organization – Architecture – Structure – Operations - Distributed Systems – Special Purpose Systems – Computing Environments – Operating System Services - System Calls – Types of System Calls.

UNIT – II **9**

Process Management and Coordination: Processes: Concepts - Scheduling – Operations - Interprocess Communication - Multithreaded Programming: Multithreading Models – Threading Issues - Process Scheduling: Scheduling Criteria – Algorithms.

UNIT – III **9**

Process Coordination: Synchronization: The Critical Section Problem – Peterson’s Solution – Semaphores – Classic Problem of Synchronization - Deadlocks: Deadlock Characterization – Methods for handling Deadlocks - Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlocks.

UNIT – IV **9**

Memory Management: Memory Management Strategies: Swapping – Contiguous Memory Allocation – Paging – Structure of the Page table – Segmentation - Virtual Memory Management: Demand Paging – Copy-on-Write – Page Replacement – FIFO – OPT – LRU algorithms – Thrashing.

UNIT – V **9**

Storage Management: File System: File Concept – Access Methods – Directory and Disk Structure – File Allocation Methods - Secondary Storage Structure: Disk Structure – Attachment – Scheduling algorithms – Disk Management.

Lecture: 45, Tutorial: 15, TOTAL: 60

REFERENCE BOOKS:

1. Silberschatz. Abraham, Galvin Peter Baer and Greg Gagne, “Operating System Concepts”, 9th Edition, John Wiley & Sons Pvt. Ltd., New York, 2012.
2. Dhamdhare D.M., “Systems Programming”, Tata McGraw Hill Publishing Company, New Delhi, 2011.
3. William Stallings, “Operating Systems: Internals and Design Principles”, 8th Edition, Pearson Education, 2014.

Course Outcomes:

On completion of the course the students will be able to

- know the concept of operating systems and its serves
- understand the various process management concepts
- master the various CPU scheduling, process synchronization and deadlocks
- know the issues related to virtual memory
- learn the concepts of file system and disk management

UNIT – I **9**

Software Process: Introduction - Process Models: Water Fall Model – Incremental Process Models – Evolutionary Process Models – Concurrent – Component Based Development Model. Agile Development: Agile Process – Extreme Programming - Agile process models.

UNIT – II **9**

Requirements Engineering: Stakeholders – Multiple Viewpoints - Eliciting - Negotiating – Validating Requirements. Requirement Modeling: Requirement analysis – Data Modeling - Class-Based Modeling – Flow - Oriented modeling.

UNIT – III **9**

Design Concepts: Design Process – Design Concepts – Design Model. Architectural Design: Software Architecture – Architectural styles – Architectural Design – Transform Mapping. Component Level Design: Cohesion – Coupling.

UNIT – IV **9**

SCM and Project Management: Software Configuration Management – SCM Repository – SCM Process. Project Management: People – Product – Process – Project. Project Metrics: Software Measurement – Metrics for Software Quality. Estimation for Software Projects: Decomposition Techniques – Empirical Estimation Models.

UNIT – V **9**

Software Risk and Maintenance: Risk Management. Maintenance and Reengineering: Software Maintenance - Supportability – Reengineering – Business Process – Reverse Engineering – Restructuring - Forward Engineering. Software Process Improvement: SPI Process.

TOTAL: 45**REFERENCE BOOKS:**

1. Pressman. Roger S., “Software Engineering - A Practitioner’s Approach”, 7th Edition, Tata McGraw Hill, New York, 2010.
2. Sommerville Ian, “Software Engineering”, 7th Edition, Pearson Education Asia, Singapore, 2008.
3. Jalote. Pankaj, “An Integrated Approach to Software Engineering”, Narosa Publishing House, New Delhi, 2008.

Course Outcomes:

On completion of the course the students will be able to

- know the various life cycle models in software engineering
- apply various SDLC model for real time applications
- understand about software configuration management and maintenance
- know the role and responsibilities of software engineer
- build an idea about software risk and maintain in reengineering

14MCL31 DATA STRUCTURES LABORATORY

0 0 3 1

LIST OF EXPERIMENTS / EXERCISES:

1. Stack implementation using array
2. Linear and circular queue implementation using array
3. Implement singly linked list operations
4. Implement doubly linked list operations
5. Develop a program to implement circularly linked list operations
6. Implement binary tree traversal: in-order, pre-order, post-order
7. Implementation of binary search tree: insertion and deletion
8. Implementation of graph traversal: depth first search and breadth first search
9. Implementation of various sorting techniques
10. Develop a program to implement linear and binary search.

TOTAL : 45

REFERENCES / MANUALS / SOFTWARE:

1. Operating Systems: Linux / Windows
2. Software: Borland C

Course Outcomes:

On completion of the course the students will be able to

- apply an appropriate data structures for given applications
- analyze algorithm design techniques
- implement the efficient algorithm for given problem

LIST OF EXPERIMENTS / EXERCISES:

1. Basic SQL statements – creating and managing tables using DDL, DML, integrity constraints
2. DCL, TCL and DB object commands
3. Single row, aggregate functions and set operations
4. Joins & Sub queries - Displaying data from multiple tables using SQL operators, GROUPBY, HAVING and ORDERBY clause
5. Basic PL/SQL programs
6. Functions and procedures
7. Cursors and exception handling
8. Triggers and package
9. Report writer using SQL
10. Develop an application using front and back end connectivity

TOTAL : 45**REFERENCES / MANUALS / SOFTWARE:**

1. Front End: Microsoft Visual Studio 6.0, Microsoft .NET Framework SDK V2.0
2. Back End: Oracle / SQL Server

Course Outcomes:

On completion of the course the students will be able to

- create and manipulate the databases
- formulate complex queries using SQL
- implement PL/SQL programs using procedure, functions, triggers and cursors

LIST OF EXPERIMENTS / EXERCISES:

1. Develop Java applications using classes and objects
2. Develop Java applications to implement overloading
3. Java program to implement inheritance
4. Develop Java applications to implement overriding
5. Java program to illustrate exception handling
6. Develop Java applications using interfaces
7. Develop Java applications using packages
8. Java program to illustrate the working principle of java threads
9. Java programs to illustrate legacy classes and interfaces
10. Java programs to demonstrate the use of various swing components and containers

TOTAL : 45**REFERENCES / MANUALS / SOFTWARE:**

1. Operating Systems: Linux / Windows
2. Software: JDK, JSDK

Course Outcomes:

On completion of the course the students will be able to

- apply various object oriented features in Java
- implement exception handling and multithreading in Java programs
- develop interactive user interface using swing components

UNIT – I **9**

Network Fundamentals: Introduction - Network Models: OSI Model, TCP/ IP Protocol suite, Addressing – Data and Signals: Analog and Digital, Transmission Impairment.

UNIT – II **9**

Communication Techniques: Multiplexing: FDM, WDM and TDM - Transmission Media: Guided and Unguided Media – Switching: Circuit Switched Networks, Datagram Networks and Virtual circuit Networks.

UNIT – III **9**

Data Link Layer: Error Detection and Correction Techniques: Parity Check, Two Dimensional Parity Check, Check Sum, CRC and Hamming Codes – Data Link Control: Framing, Noiseless Channels and Noisy Channels – Multiple Access – Wireless LAN: IEEE 802.11.

UNIT – IV **9**

Network Layer: Logical Addressing: IPv4 Addresses and IPv6 Addresses – Internet Protocol: IPv4 and IPv6 –Address Mapping: ARP, RARP, BOOTP, DHCP – Routing: Unicast Routing Protocols, Multicast Routing Protocols.

UNIT – V **9**

Transport and Application Layer: Process to Process Delivery: UDP, TCP - Congestion Control - QoS – Techniques to improve QoS – Network Management: SNMP

TOTAL: 45**REFERENCE BOOKS:**

1. Forouzan Behrouz A., “Data communication and Networking”, 5th Edition, Tata McGraw Hill Publishing Company, New Delhi, 2012.
2. Tanenbaum Andrew S., “Computer Networks”, 5th Edition, Prentice Hall of India, New Delhi, 2013.
3. Peterson Larry L. and Davie Bruce S., “Computer Networks: A Systems Approach”, 4th Edition, Harcourt Asia / Morgan Kaufmann Publishers, Singapore, 2008.
4. Peter L. Dordal, “An Introduction to Computer Networks”, Loyola University, Chicago, 2015.

Course Outcomes:

On completion of the course the students will be able to

- understand the concept of data communications
- introduce IEEE standards employed in computer networking
- familiarize with different protocols and network components
- gain knowledge about addressing mechanism
- know the data delivery processing

UNIT – I 9

Object Oriented Methodologies: An Overview of Object Oriented Systems Development – Object Basics – Object Oriented Systems Development Life Cycle - Methodologies: Rumbaugh, Booch and Jacobson Methodology.

UNIT – II 9

Unified Approach and Modeling: Patterns – Frameworks - Unified Approach – **UML:** Introduction - Static and Dynamic Models – UML Class Diagram – Use Case Diagram – UML Dynamic Modeling: Interaction Diagram – Statechart Diagram – Activity and Implementation Diagram.

UNIT – III 9

Object Oriented Analysis: Use-Case Driven: Use Case Model - Developing Effective Documentation – Classification: Approaches - Identifying Object relationship, Attributes and Methods: Associations – Super-Sub class Relationships – A-Part-of Relationships- Aggregation – Class and Object Responsibility.

UNIT – IV 9

Object Oriented Design: Introduction - Design Process - Design Axioms – Corollaries - Designing Classes: Process – Class Visibility – Refining Attributes – Designing Methods and Protocols - Access Layer: Object Storage and Persistence – Access Control –Object-Oriented Database Management Systems - Object Relational Systems – Multidatabase Systems – Designing Access Layer Classes.

UNIT – V 9

Software Quality: View Layer: Designing Interface Objects – Purpose of a View Layer Interface – Prototyping the User Interface. Software Quality Assurance: Test Cases - Test Plan – System Usability and Measuring User Satisfaction: Usability Testing - User Satisfaction Test.

TOTAL: 45**REFERENCE BOOKS:**

1. Bahrami Ali, “Object Oriented Systems Development”, Tata McGraw Hill Publishing Company, New Delhi, 2008.
2. Brahma Dathan and Salnath Ramnath, “Object-Oriented Analysis Design and Implementation”, University Press, 2010.
3. Russ Miles and Kim Hamilton, “Lealniy UML 2.0”, O’Reilly, 2008.
4. Michael Blaha and James Rumbaugh, “Object Oriented Modeling and Design with UML”, Prentice Hall of India, 2005.

Course Outcomes:

On completion of the course the students will be able to

- familiarize with the topics of object oriented system analysis and designs
- gain knowledge to design an application using UML
- analyze the applications with the help of UML design
- create use case documents that capture requirements for a software system
- create class diagrams for building a software systems
- understand the facets of the Unified Process approach

UNIT – I **9**

Introduction to J2EE: J2EE Platform: Styles – Platform – J2EE and Container Architecture – Technologies – Directory Services: Naming and Directory Services – Java and LDAP – Operations.

UNIT – II **9**

Distributed Computing: RMI: Architecture – Exceptions – Developing Applications – Parameter Passing – Distributed Garbage Collector – Dynamically Loading Classes – Object Activation – RMI-IIOP.

UNIT – III **9**

JDBC: Database Drivers – Package – Data Sources – Connection Pooling – Servlet: Overview – Implementation – Configuration – Exceptions – Lifecycle.

UNIT – IV **9**

Java Server Programming: JSP Nuts and Bolts: Directives – Scripting Elements – Standard Actions – Implicit Objects – Scope – JSP Tag Extensions: Simple Tag – Anatomy – JSP Tag Libraries: Benefits – Examples – Introduction – JSPTL Tags.

UNIT – V **9**

Triad of Beans: Overview of EJB: Component Architecture – Ecosystem – Types – Distributed Objects and Middleware – Enterprise Bean Class – EJB Component Development - Session Bean: Introduction – Subtypes – Characteristics – Entity Beans: Persistence Concepts – Features – Contexts.

TOTAL: 45**REFERENCE BOOKS:**

1. Subramanyam Allamaraju and Cedric Buest, “Professional Java Server Programming J2EE Edition”, APress, 2007.
2. Ed Roman, Scott W.Ambler, Tyler Jewell, “Mastering Enterprise Java Beans”, 3rd Edition, John Wiley & Sons Inc., 2009.
3. Kogent Solution Inc., “ Java Server Programming J2EE Edition Java EE5”, Dreamtech Press, 2008.

Course Outcomes:

On completion of the course the students will be able to

- develop an enterprise application using the distributed computing technologies
- familiarize the concept of Java Database Connectivity
- know the working flow of servlet
- develop an application using Java server programming
- master various types to of beans to develop EJB applications

LIST OF EXPERIMENTS / EXERCISES:

1. Program to perform process creation
2. Program to implement process scheduling – FCFS, SJFS, round robin
3. Program to implement inter- process communication using pipes
4. Program to perform process synchronization
5. Implement producer and consumer problem using semaphores
6. Program to perform memory management scheme using first fit and best fit
7. File transfer program using TCP socket
8. Echo client – server program using UDP socket
9. Chat program using TCP socket
10. Develop a program using multicasting technique

TOTAL : 45**REFERENCES / MANUALS / SOFTWARE:**

1. Operating System: Linux
2. Software: Borland C

Course Outcomes:

On completion of the course the students will be able to

- develop programs on process creation and synchronization
- schedule the process using various process scheduling algorithms
- perform inter process communication using pipes
- develop programs using sockets

LIST OF EXPERIMENTS / EXERCISES:

1. Create a distributed application to download various files using RMI
2. Create a distributed chat application using RMI
3. Create a distributed application to perform arithmetic operations using RMI-IIOP
4. Create a java program using servlet
5. Develop an application using JDBC
6. Develop a program to create check boxes using JSP
7. Develop a simple application using JSP
8. Develop an enterprise java bean application for banking operation using stateless session bean
9. Develop an enterprise java bean application for weather forecasting using stateful session bean
10. Develop an enterprise java bean application for inventory maintenance using entity bean

TOTAL : 45**REFERENCES / MANUALS / SOFTWARE:**

1. Operating System : Windows
2. Software: Blazix, JDK, J2SDK and BDP

Course Outcomes:

On completion of the course the students will be able to

- develop an enterprise application using the distributed computing technologies
- develop an application using JDBC and servlet programming
- develop an application using Java server programming and EJB

UNIT - I**9**

Introduction to PHP5: PHP: Introduction – Data types - Variables – Expressions – Operators – Flow-control Statements – Functions - String Manipulation - Regular Expression – Arrays- Features of PHP5

UNIT - II**9**

Streams and Libraries: More Obscure PHP: Array Functions and Callbacks- glob() -PHP Streams PHP Extensions: PDFLib- GD Library- Ming.

UNIT - III**9**

Configuring PHP and MYSQL Database: PHP Configuration: Modifying php.ini-PHP Configuration during Runtime-Advanced MySQL: The Basics, Revisited-Querying Multiple Tables-Full-Text Searching-InnoDB Tables-Controlling Access-Analyzing the Database-Database Maintenance

UNIT - IV**9**

PHP Session and Ajax: Web Techniques: Maintaining State-Cookies-Sessions-AJAX: History-XMLHTTP and XMLHttpRequest-AJAX Libraries- AJAX usage.

UNIT - V**9**

Apache and Security: Apache Tricks: URL Rewriting- URL Spell Checking -Content Compression-Using MySQL with Apache and SSL-Apache as a File Repository- Site Security: Controlling Access-Website Attacks.

TOTAL: 45**REFERENCE BOOKS:**

1. Jason Gerner, Elizabeth Naramore, Morgan L. Owens and Matt Warden ,“Professional LAMP: Linux®, Apache, MySQL®, and PHP5 Web Development”, Wiley Publication, 2006.
2. Kevin Tatroe, Peter MacIntyre and Rasmus Lerdorf, “ Programming PHP” , 3rd Edition, O’Reilly, 2013.
3. Steven Holzner, “PHP: The Complete Reference”, Tata McGraw Hill Education, 2008.

Course Outcomes:

On completion of the course the students will be able to

- learn the web technologies based on open software LAMP
- install and configure the MySQL database with PHP and Apache to provide dynamic content for the web
- know different Apache tips and tricks used in AJAX and PHP
- apply the various ways to improve site security
- develop dynamic, interactive web pages and future enterprise web applications

UNIT – I **9**

Principles of Testing: SDLC Models – Phases of software project-Quality Control and Assurance – Verification and Validation – Types of Testing: White Box Testing – Challenges in White Box Testing, Static and Structural Testing.

UNIT - II **9**

Black Box Testing: Class based testing –Requirements based testing-Positive and Negative testing-Boundary value analysis Decision tables-Equivalence Partitioning-State Based compatibility-User Documentation-Domain testing- Integration Testing-Types-Phase of Testing-Scenario Testing-Defect Bash- System and Acceptance Testing- Functional and Non-Functional Testing - Acceptance Testing - Testing Phases.

UNIT - III **9**

Performance Testing: Introduction to Performance Testing –Factors Governing- Methodology — Tools for Performance Testing - Process for Performance Testing-Regression Testing –Types-Best Practices- Internationalization Testing – Primer on Internationalization-Test Phases-Enabling Testing-Locale Testing-Internationalization Validation-Fake Language-Tools-Challenges and issues.

UNIT – IV **9**

Adhoc Testing: Buddy Testing – Pair Testing – Exploratory Testing – Iterative Testing - Agile and Extreme Testing – Defect Seeding-Usability and Accessibility Testing – Approach to Usability-Quality Factors-Aesthetics Testing – Accessibility Testing-Test Roles.

UNIT – V **9**

Organizational Issues and Applications: Perceptions and Misconceptions about Testing- Comparison between Testing and Development functions- Test Planning – Management – Test Process – Reporting – Test Automation-Scope of Automation-Design and Architecture-Requirements for Test Tool.

TOTAL: 45**REFERENCE BOOKS:**

1. Srinivasan Desikan and Gopalaswamy Ramesh, “Software Testing – Principles and Practices”, Pearson Education, New Delhi, 2008.
2. Renu Rajani and Pradeep Oak, “Software Testing – Effective Methods, Tools and Techniques”, Tata McGraw Hill, New Delhi, 2006
3. Prasad K.V. K. K., “Software Testing Tools”, Dreamtech Press, New Delhi, 2005.
4. Perry William E., “Effective Methods for Software Testing”, 2nd Edition, John Wiley & Sons, New York, 2006.

Course Outcomes:

On completion of the course the students will be able to

- test software in structured and organized ways
- design and automate high quality tests during unit and integration testing
- design tests based on test criteria
- study the various types of errors and fault models
- apply the software testing techniques in commercial environments

UNIT – I**9**

Basics of Cloud computing : History of Cloud Computing – Cloud Architecture –Cloud Storage – Need for Cloud Computing - Advantages of Cloud Computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services - Web-Based Application – Cloud Service Development.

UNIT - II**9**

Cloud Services: Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds.

UNIT - III**9**

Cloud Computing Applications-I: Collaborating on Calendars, Schedules and Task Management: Exploring Online Scheduling Applications, Exploring Online Planning and Task Management. Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management

UNIT – IV**9**

Cloud Computing Applications-II: – Collaborating on Word Processing – Collaborating on Spreadsheets - Collaborating on Databases – Collaborating on Presentations - Storing and sharing Files – Sharing digital photographs – Web based Desktops.

UNIT - V**9**

Online Collaboration: Collaborating via Web-Based Communication Tools: Evaluating Web Mail Services – Evaluating Instant Messaging Services - Evaluating Web Conferencing Tools- Collaborating via Social Networks and Groupware: Creating Groups on Social Networks – Evaluating Online Groupware - Collaborating via Blogs and Wikis: Evaluating Blogs for Collaboration – Evaluating Wikis for Collaboration.

TOTAL: 45**REFERENCE BOOKS:**

1. Michael Miller, “Cloud Computing: Web-Based Applications that Change the Way You Work and Collaborate Online”, Que Publishing, August 2008.
2. George Reese, “Cloud Application Architectures: Building Applications and Infrastructure in the Cloud”, 1st Edition, O'reilly, April 2009.
3. Toby Velte, Anthony Velte and Robert Elsenpeter, “Cloud Computing - A Practical Approach”, Tata McGraw Hill, 2010.

Course Outcomes:

On completion of the course the students will be able to

- explore cloud computing concepts and technologies
- implement cloud computing for the corporation
- design various applications by integrating cloud services
- adopt the cloud computing services and tools in their real life scenarios
- explore some important cloud computing driven commercial systems such as GoogleApps, Microsoft Azure and Amazon Web Services and other businesses cloud application

LIST OF EXPERIMENTS:

1. PHP program using regular expression and string manipulation
2. PHP program using arrays and objects
3. Develop a PHP application using inheritance and interface
4. Develop a PHP application using array_map() and array_filter()
5. To configure runtime PHP and mail service
6. Develop a PHP application using PDF library and GD library
7. Application development using PHP, MYSQL and Ajax
8. PHP session handling
9. Configuring Apache web server
10. Develop a PHP for a log file credentials for SQL injection

TOTAL: 45**REFERENCES / MANUALS / SOFTWARE:**

1. Windows/Linux, XAMPP Server, WAMP Server
2. www.php.net/manual/en/index.php
3. www.dev.mysql.com/doc/refman/5.7/en/
4. www.php.com
5. www.w3schools.com
6. www.tutorialspoint.com
7. www.lamphowto.com/

Course Outcomes:

On completion of the course the students will be able to

- master in two key areas web designing and web development
- configure complex virtual hosting and support web applications with dynamic content including PHP and MySQL database
- install, upgrade, configure, customize, manage and test common network services such as Apache and MySQL server

LIST OF EXPERIMENTS:

1. Recording test in analog and context sensitive mode
2. Checking GUI Objects
3. Checking tables
4. Checking Bitmap Objects
5. Creating data driven test
6. Running and Analyzing a Test with Regular Expressions
7. Maintaining test script
8. Results Formatting
9. Arithmetic Operations using User Defined functions
10. Recovery Scenarios

TOTAL: 45**REFERENCE / MANUALS /SOFTWARES:**

1. Online Guide Win Runner 7.0 Tutorial

Course Outcomes:

On completion of the course the students will able to

- understand and implement the software testing process
- obtain knowledge and comparison of various testing strategies
- test adequacy assessment using control flow, data flow and program mutations

14MCE01 XML AND WEB SERVICES

3 0 2 4

UNIT – I

9

Introduction to XML: Introduction – Revolutions of XML – Fundamentals of XML – Defining XML Documents: DTD - Name spaces - XML schema

UNIT – II

9

Building XML-Based Applications: The XFiles: XPath - XPointer - XLink - Parsing XML using DOM – DOM Levels- DOM Core – DOM Traversal and Range – DOM Implementation – JAXB – SAX vs. DOM – SAX Basics – Working with SAX.

UNIT – III

9

XML Transformations: Transforming XML with XSL – Integrating XML with Database – Formatting XML on the Web – XML Presentation Using CSS – Overview of XHTML – Xforms.

UNIT – IV

9

Web Services Building Block: Architecting Web Services – SOAP – WSDL – UDDI - Leveraging XML in Visual Studio .NET

UNIT – V

9

Implementation of Web Services: Implementing XML in E-Business – Delivering Wireless and Voice Services with XML - Quality of Services – QoS Metrics for Web Services –Design Patterns - QoS Enabled Web Service.

Lecture: 45, Practical: 30, TOTAL: 75

REFERENCE BOOKS:

1. Ron Schmelzer, Travis Vandersypen, Jason Bloomberg, Madhu Siddalingaiah, Sam hunting, Michael D. Qualls, David Houlding, Chad Darby and Diane Kennedy, “XML and Web Services Unleashed”, Pearson Education, 2008.
2. Frank P. Coyle, “XML, Web Services, and the Data Revolution”, Addison Wesley Professional, 2002.
3. Sandeep Chatterjee and James Webber, “Developing Enterprise Web Services: An Architects Guide”, Pearson Education India, November 2007.

Course Outcomes:

On completion of the course the students will be able to

- understand the basics of XML documents validations
- parse XML documents by using DOM and SAX
- know the formatting XML data to the desired format
- learn the concepts of XML and web services in business
- know the methodology and implementation of web services

UNIT – I

9

Basics of C#: Overview of C# - Literals – Variables - Data Types- Arrays – Operators - Expressions - Control Structures – Methods - Strings - Structures- Enumerations – Classes - Objects - Constructors –Destructors - Conversion Between Types: Boxing and UnBoxing.

UNIT – II

9

Advanced Features of C#: Inheritance-Polymorphism- Interfaces- Overloading - Overriding – Properties and Indexers - Delegates - Events - Errors and Exceptions – Assemblies – Generics.

UNIT – III

9

WinForms: Controls – Validation- Menus - Dialogbox - Form Inheritance - Developing Custom, Composite and Extended Controls - Working with Resource Files.

UNIT – IV

9

Data Access: Overview of Data Access – Architecture of ADO.NET – ADO.NET Built-in Classes and Methods - SqlDataSource Control – List Controls – Gridview Control – Details view and Form view control – Binding Data Access Component – XML and ADO.NET - Simple Application using ADO.NET.

UNIT – V

9

ASP.NET Environment and Controls: Overview of ASP.Net Framework – Life cycle – Directives-client and server side management – Standard Controls – Validation Controls – Rich Controls – Navigation Control – Login Control- Designing ASP .NET website with Master page and Themes – Custom Control with user control.

Lecture: 45, Practical:30, TOTAL:75**REFERENCE BOOKS:**

1. Herbert Schildt, “C# 4.0: The Complete Reference”, Tata McGraw Hill Professional Publishing, 2010.
2. Matthew MacDonald, “Beginning ASP.NET 3.5 in C# 2008: From Novice to Professional”, 2nd Edition, Apress, 2008.
3. Rod Stephens, “C# 5.0 Programmer's Reference”, Wiley India Pvt. Ltd, 2014.

Course Outcomes:

On completion of the course the students will be able to

- understand the principles of object oriented programming
- develop windows applications using understand controls
- design web application using themes and master page
- learn data access using ADO.net and binding
- add functionality to server controls

14MCE03 DATA MINING

3 0 2 4
9

UNIT – I

Data Mining: Introduction – Steps in Data Mining Process – Databases – Data Mining Functionalities – Technologies – Applications – Issues in Data Mining – Data Objects and Attribute Types.

UNIT – II

Data Preprocessing: Data Cleaning – Data Integration – Data Reduction – Data Transformation and Discretization.

UNIT – III

Classification Concepts and Methods: Basic Concepts: Decision Tree Induction – Bayes Classification Methods – Rule–Based Classification – Advanced Methods: Bayesian Belief Networks – Classification by Back propagation.

UNIT – IV

Cluster Analysis and Outlier Detection :Introduction to clustering - Partitioning Methods – Hierarchical Methods – Probabilistic Model-Based Clustering - Outliers - Outlier Analysis – Outlier Detection Methods

UNIT – V

Association Rule and Web Mining: Association: Frequent Itemset - Mining Methods : Apriori-Frequent Pattern tree – Web Mining: Spatial – Multimedia Data Mining – Text Mining – World Wide Web.

Lecture: 45, Practical:30, TOTAL: 75

REFERENCE BOOKS:

1. Jiawei Han, Micheline Kamber and Jian Pei, "Data Mining Concepts and Techniques", 3rd Edition, Morgan Kaufmann Publishers, 2012.
2. Gordon S. Linoff and Michael J.A. Berry, "Data Mining Techniques", Wiley Publication Inc., 2011.

Course Outcomes:

On completion of the course the students will be able to

- understand the data mining concepts
- gain the knowledge of data preprocessing techniques
- familiar with the algorithms and methods in data mining
- know the basic knowledge of web mining
- learn the basic knowledge of text mining

UNIT – I

Introduction: Algorithm – Algorithm Specification – Performance Analysis – Elementary Data Structures – Dictionaries – Set and Disjoint set unions – Divide and Conquer method: General Method – Finding the maximum and minimum.

UNIT – II

The Greedy Method: The general method – Knapsack problem – Tree vertex splitting - Job sequencing with deadlines – Minimum cost spanning trees – Optimal storage on tapes – Optimal merge patterns - Single source shortest paths.

UNIT – III

Dynamic Programming: The general method – Multistage graphs – All pairs shortest paths – Single source shortest paths – Optimal binary search trees – String editing – 0/1 Knapsack – The travelling sales person problem – Flow shop scheduling.

UNIT – IV

Backtracking: The general method – The 8-Queens problem – Sum of subsets – Graph coloring – Hamiltonian cycles – Knapsack problem.

UNIT – V

Branch and Bound: The method: LC Search – The 15-puzzle – Control Abstractions for LC-Search – Bounding – FIFO Branch and Bound – LC Branch and Bound - 0/1 Knapsack problems – Travelling salesperson.

Lecture: 45, Practical:30, TOTAL: 75

REFERENCE BOOKS:

1. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, “Fundamentals of Computer Algorithms”, 2nd Edition, Silicon Press, 2010.
2. Anany Levitin, “Introduction to the Design and Analysis of Algorithms”, 2nd Edition, Pearson Education, 2008.
3. Weiss M.A., “Data Structures and Algorithm Analysis in C”, 3rd Edition, Pearson Education Asia, New Delhi, 2007.

Course Outcomes:

On completion of the course the students will be able to

- understand, explain, model and analyze a given problem as an algorithm
- master in different algorithm design techniques
- analyze performance of algorithms
- apply and implement learned algorithm design techniques to solve the real world problems
- analyze the complexities of various problems in different domains

UNIT – I**9**

Overview of Graphics System: Video display devices-Raster Scan Systems-Random Scan Systems-Graphics Monitor and Workstation-Input Devices-Hardcopy Devices-Graphics Software - DDA Algorithm - Bresenham's line drawing Algorithm- Circle and Ellipse Generating Algorithm.

UNIT – II**9**

Two Dimensional Transformation: Basic Transformations-Matrix Representation-Composite Transformation-Other Transformation-Two Dimensional Viewing: View Pipeline-Viewing Co-ordinate-Window to Viewport co-ordinate Transformation-Viewing Function.

UNIT – III**9**

Two Dimensional Clipping: Clipping Operation-Line Clipping: Cohen-Sutherland- Polygon Clipping: Sutherland Hodgeman - Curve Clipping-Text and Exterior clipping.

UNIT – IV**9**

3D Concepts and Transformation: Three Dimensional Concepts: Display Methods-Graphics Packages-3D Basic Transformation – 3D Object Representation –Polygon Surfaces - Spline Representation - Bezier Curves.

UNIT – V**9**

3D Viewing and Color Models: 3D viewing: Projections - Color Models: XYZ - CIE - RGB - CMY - HSV-Animation: Design of Animation Sequences – Morphing.

Lecture: 45, Practical:30, TOTAL: 75**REFERENCE BOOKS:**

1. Donald D. Hearn and Pauline M. Baker, "Computer Graphics", 2nd Edition, Pearson Education, 2013.
2. Foley, Van Dam and Feiner Hughes, "Computer Graphics: Principles and Practice in C", 2nd Edition, Pearson Education, New Delhi, 2005.

Course Outcomes:

On completion of the course the students will be able to

- learn the fundamental of graphics systems
- implement line drawing, circle and ellipse generation algorithms
- learn the basics of 2D transformations, viewing and clipping
- gain knowledge in 3D transformations and object representations
- understand 3D viewing and colour models

14MCE06 DISTRIBUTED SYSTEMS

3 0 2 4
9

UNIT – I

Introduction: Characterization of Distributed Systems – System Models – Physical, Architectural and Fundamental Models - Networking and Internetworking: Types – Network Principles – Internet Protocols.

UNIT – II

Interprocess Communication: API for Internet protocols – External data representation and Marshaling – Multicast communication – Remote invocation - Indirect Communication.

UNIT – III

Operating System Support- Peer to Peer Systems: Napster and its legacy – Peer-to-peer middleware – Routing overlays - Distributed File System: Architecture.

UNIT – IV

Name Services: Name services and the Domain Name System- Directory services- Time and Global States – Coordination and Agreement.

UNIT – V

Transactions and Concurrency Control: Distributed Transactions – Replication – System model and group communication – Fault Tolerant Services – Transactions with Replicated Data.

Lecture: 45, Practical:30, TOTAL: 75

REFERENCE BOOKS:

1. Coulouris George, Dollimore Jean, Kindberg Tim and Blair Gordon, “Distributed Systems - Concepts and Design”, 5th Edition, Pearson Education, New Delhi, 2013.
2. Tanenbaum Andrew S and Maarten Van Steen, “Distributed Systems – Principles and Paradigms”, 2nd Edition, Pearson Education, 2007.
3. Liu M.L., “Distributed Computing Principles and Applications”, Pearson Education, 2004.

Course Outcomes:

On completion of the course the students will be able to

- get an idea on computer networks relevant to distributed systems and the underlying technologies for the Internet
- know about the working details of distributed systems and their architecture
- get insight into the issues to be solved in the design of distributed systems
- gain knowledge about the shared data and its usage in the distributed transactions
- design and implement the distributed systems infrastructure

14MCE07 DESIGN PATTERNS

3 0 2 4
9

UNIT – I

Design Patterns: Introduction - Creational Pattern: Abstract Factory Pattern –Builder Pattern – Factory Method - Prototype Pattern Singleton Pattern.

UNIT – II

Structural Patterns: Adapter Pattern – Bridge Pattern – Composite Pattern – Decorator Pattern - Facade Pattern - Flyweight - Proxy Pattern.

UNIT – III

Behavioral Pattern I: Chain of Responsibility- Command Pattern – Interpreter Pattern - Iterator Pattern - Mediator Pattern - Memento pattern.

UNIT – IV

Behavioral Pattern II: Observer Pattern – State Pattern - Strategy Pattern – Template Pattern – Visitor Pattern.

UNIT – V

Case Study: Designing a Document Editor: Design Problems - Document Structure - Formatting – Embellishing the User Interface – Supporting Multiple Look-and-Feel Standards – Supporting Multiple Window Systems – User Operations – Spelling Checking and Hyphenation.

Lecture: 45, Practical:30, TOTAL: 75

REFERENCE BOOKS:

1. Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides, “Design Patterns”, 1st Edition, Pearson Education, 2009.
2. Craig Larman, “Applying UML and Patterns – An introduction to Object-Oriented Analysis and Design and Iterative Development”, 3rd Edition, Pearson Education, 2005.
3. Eric Freeman, Elisabeth Freeman and Kathy Sierra, “Head First Java Design Patterns”, O’Reilly, 2004.

Course Outcomes:

On completion of the course the students will be able to

- understand about design patterns
- use design patterns as a vocabulary for understanding and discussing object-oriented software design
- apply design patterns to various applications
- formulate structural patterns to compose classes and objects into larger structures
- use behavioural pattern to manage algorithms and assign responsibilities to objects

UNIT – I**9**

Introduction: History – Standards – Models – Addressing – Versions – Local Area Networks – Wide Area Networks – Connecting devices - IP addresses – Classful Addressing.

UNIT – II**9**

Internet Protocol: Subnetting and Supernetting – Delivery – Routing – Routing table – Datagram – Fragmentation – Options – Checksum – IP Package – ARP – RARP- Internet Control Message Protocol: Messages – ICMP Packages.

UNIT – III**9**

Transmission Control Protocol: User Datagram Protocol– UDP Operation – Use of UDP – UDP Package – TCP Services – Features – Segment – Connection – Transition diagram – Flow Control – Error Control – Congestion Control – TCP Timers and Package.

UNIT – IV**9**

Application Layer and Client Server Model: 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**9**

Application Protocols : File Transfer Protocol: Connections – Communication-Simple Mail Transfer Protocol – Simple Network Management Protocol – Hyper Text Transfer Protocol: Transaction – Request and Response messages.

TOTAL: 45**REFERENCE BOOKS:**

1. Forouzan, Behrouz A., “TCP/IP Protocol Suite”, 3rd Edition, Tata McGraw-Hill, New Delhi, 2008.
2. Comer, Douglas E., “Internetworking with TCP/IP”, 5th Edition, Prentice-Hall of India, New Delhi, 2007.
3. Comer, Douglas E and Stevens David L., “Internetworking with TCP/IP”, 2nd Edition, Volume I, II and III, Prentice-Hall of India, New Delhi, 1994.

Course Outcomes:

On completion of the course the students will be able to

- learn the fundamental concepts of functional area of TCP/IP protocol suite
- comprehend and manipulate IP addressing, classes, subnets, and subnet masks
- comprehend and manipulate IP routing
- understand the concept of client server technology and protocols
- know how various applications work over IP including HTTP, FTP, SMTP and others

UNIT – I**9**

Introduction to Big Data: Analytics –Nuances of Big Data –Value –Issues – Case for Big Data –Big Data options Team challenge –Big Data sources –Acquisition –Nuts and Bolts of Big Data.

UNIT – II**9**

Features of Big Data: Security, Compliance, Auditing and Protection -Evolution of Big Data – Best Practices for Big Data Analytics -Big Data Characteristics -Volume, Veracity, Velocity, Variety.

UNIT – III**9**

Predictive Analytics and Visualization: Predictive Analytics –Supervised –Unsupervised Learning – Neural Networks –Kohonen Models –Normal –Deviations from Normal Patterns –Normal behaviours –Expert options –Variable entry -Mining Frequent Itemsets -Market based model –Apriori Algorithm –Handling large data sets in main memory –Limited Pass algorithm –Counting Frequent Itemsets in a Stream –Clustering Techniques –Hierarchical –K Means Clustering.

UNIT – IV**9**

Hadoop : Introduction – Data storage and analysis- Comparison with other systems – History – hadoop ecosystem-Hadoop releases- Analyzing weather dataset with Hadoop – Scaling out – Hadoop streaming – Pipes – Hadoop Distributed file system.

UNIT – V**9**

Developing a MapReduce Application: The Configuration API – Configuring the development environment – Writing a unit test – Running locally on test data – Running on a cluster – Tuning a job – Mapreduce workflows.

TOTAL: 45**REFERENCE BOOKS:**

1. Frank J Ohlhorst, “Big Data Analytics: Turning Big Data into Big Money”, Wiley and SAS Business Series, 2012.
2. Colleen Mccue, “Data Mining and Predictive Analysis: Intelligence Gathering and Crime Analysis”, Elsevier, 2007.
3. Tom White ,“ Hadoop: The Definitive Guide”, 3rd Edition, O’reilly Media, 2012.

Course Outcomes:

On completion of the course the students will be able to

- know the concepts and characteristics of big data
- recognize the usage of data analytics and its related tools
- gain the concept of stream computing and real time applications
- categorize the predictive analysis techniques and determine the use of Hadoop frameworks
- develop an application using map reduce

UNIT - I**9**

Information Security: History- critical characteristics of information- NSTISSC security model- Components of information system-Approaches to information security implementation- The SDLC- The security SDLC - Need for security- business needs-threats- attacks- Legal, ethical and professional issues in IS.

UNIT – II**9**

Security Planning and Security Technologies: Information security policy, standards and practices- the IS blueprint- security education, training and awareness program- continuity strategies-Firewalls-VPNs- Intrusion detection- access control.

UNIT – III**9**

Cryptographic Techniques: Conventional encryption - Classical and modern techniques – Encryption algorithms – Confidentiality – DES - Simple Data Encryption Standard (SDS) - 3DES – RSA – Elliptic curve cryptography.

UNIT – IV**9**

Network Security: Hash functions - Digest functions - Digital signatures - Authentication protocols: Kerberos – E-mail security: PGP – IP security and web security – Overview of system security.

UNIT – V**9**

Implementing Information Security: Project management for IS- Technical and nontechnical aspects of implementation- Security management models – maintenance model.

TOTAL: 45**REFERENCE BOOKS:**

1. Whitman Michael E. and Mattord Herbert J., “Principles of Information Security”, 4th Edition, Cengage Learning, 2007.
2. Stallings William, “Cryptography and Network Security: Principles & Practice”, 5th Edition, Prentice Hall of India, New Delhi, 2010.
3. Tipton Harold F. and Krause Micki, “Information Security Management Handbook”, 6th Edition, Taylor and Francis Group, 2009.

Course Outcomes:

On completion of the course the students will be able to

- understand what are the common threats faced today
- learn the fundamental concepts of information system security
- apply the basic security algorithms required by any computing system
- predict the vulnerabilities and to design a security solution for any computing system
- know how an information security management system should be planned, documented, implemented and improved

14MCE11 SOFTWARE PROJECT MANAGEMENT

3 0 0 3

UNIT – I

9

Introduction to Software Project Management: Competencies – Process Overview: Product Development Life Cycle - Software Development Life Cycle Models - Selecting an Appropriate software Life Cycle Models - The SEI CMM - International Organization for Standardization .

UNIT - II

9

Managing Domain Processes: Defining the Process Domain – Project Selection Models – Project Portfolio Management - Financial Processes - Selecting a Project Team – Defining the Goal and Scope of the Software Project – Work Breakdown Structure: Creating the WBS - Approaches to Building a WBS - Project Milestones.

UNIT - III

9

Software Size and Reuse Estimating: Identifying the Tasks and Activities - Problems and Risks with Estimating Software Size – The Effects of Reuse on Software Size - Estimating Duration and Cost: - Effort Measures - The Steps in Estimating - COCOMO: A Regression Model - COCOMO II – SLIM.

UNIT - IV

9

Organizational Planning and Project Risks: Project Roles and Skills Needed – Assigning Responsibilities to Individuals - Project Management Resource Activities – Characteristics of an Organization – Organizational Structures – Determining Project Risks: Risk Management Models – Identifying Risks – Analyzing and Quantifying Risks – Developing and Controlling Risks –Risk Categories – Steps in Developing a Risk Management Plan.

UNIT – V

9

Scheduling Fundamentals : PERT and CPM - Leveling Resource Assignments - Map the Schedule to a Real Calendar – Software Quality Assurance – Building the Software Quality Assurance Plan – Ensuring the SQAP - Software Configuration Management: Principles - Requirements - Planning and Organizing - Tools – Benefits.

TOTAL: 45

REFERENCE BOOKS:

1. Futrell Robert T., Shafer Donald F. and Safer Linda I.,“Quality Software Project Management”, Pearson Education Asia, 2002.
2. Jalote Pankaj, “Software Project Management in Practice”, Addison Wesley, 2002.

Course Outcomes:

On completion of the course the students will be able to

- match organizational needs to the most effective software development model
- get the knowledge about cost and effort estimation of the project
- create project plans that address real-world management challenges
- understand the impact to global perspectives on project management
- adapt and innovate through problem solving applied through project management techniques

14MCE12 MOBILE AND PERVASIVE COMPUTING

3 0 0 3

UNIT – I

9

Introduction to Wireless Environment: Introduction to wireless communication – Wireless radio transmissions – Signals – Antennas – Signal Propagation.

UNIT – II

9

Wireless Communication Techniques: Spread Spectrum: DSSS – FHSS - Multiplexing - Medium Access Control: SDMA – FDMA – TDMA - CDMA.

UNIT– III

9

Wireless Telecommunication Systems and Broadcast Systems: GSM - DECT system - Tetra and UMTS – Satellite Systems – Broadcast Systems - DAB – DVB.

UNIT– IV

9

Pervasive Communication: Characteristics of pervasive computing environments - Vision and challenges of pervasive computing - Pervasive computing applications - Pervasive computing and web based applications - Voice enabling pervasive computing.

UNIT – V

9

PDA and Wearable Computing: PDA in pervasive computing - User interface issues in pervasive computing, Architecture - Smart Card - based Authentication mechanisms - Wearable computing architecture.

TOTAL: 45

REFERENCE BOOKS:

1. Schiller Jochen, “Mobile Communications”, 2nd Edition, Pearson Education, New Delhi, 2011.
2. Burkhardt Jochen, Henn Horst and Hepper Stefan, Schaec Thomas and Rindtorff Klaus, “Pervasive Computing Technology and Architecture of Mobile Internet Applications”, Addison Wesley Reading, 2002.
3. Stallings William, “Wireless Communications and Networks”, Pearson Education, New Delhi, 2007.
4. Toh C.K., “Ad Hoc Mobile Wireless Networks: Protocols and Systems”, Prentice Hall, New Delhi, 2002.

Course Outcomes:

On completion of the course the students will be able to

- learn the basis of mobile and pervasive computing and its enabling technologies
- know the scientific and engineering principles related to the enabling technologies
- study the working principles of wireless LAN and its standards
- build skills in working with wireless applications protocols to develop mobile content applications
- analyze the hardware issues related to mobile and pervasive computing

UNIT – I

Neural Networks: Fundamental Basic concepts of Neural Networks – Backpropagation Networks: Architecture of Backpropagation Network- Backpropagation Learning- Illustration –Effects of tuning parameters of BPN - Selection of various parameters in BPN.

UNIT – II

Adaptive Resonance Theory: Introduction – Cluster structure, Vector Quantization, Classical ART Networks, Simplified ART Architecture - ART1 - ART2 - Applications - Sensitivities of ordering of data

UNIT– III

Fuzzy Logic: Fuzzy versus Crisp - Crisp sets - Fuzzy Sets - Crisp Relations – Fuzzy Relations – Fuzzy Systems: Crisp Logic - Predicate Logic - Fuzzy Logic - Fuzzy Rule based System - Defuzzification Methods.

UNIT– IV

Genetic Algorithms: Basic Concepts - Creation of Offspring - Working Principle – Encoding: Binary, Octal, Hexadecimal, Permutation, value and Tree Encoding -Fitness Function –Reproduction.

UNIT – V

Genetic Modeling: Inheritance Operators –Cross over - Inversion and Deletion - Mutation Operator - Bit-wise Operators – Generational Cycle – Convergence of GA - Differences and Similarities between GA and Other Traditional Methods -Advances in GA.

TOTAL: 45

REFERENCE BOOKS:

1. Rajasekaran S and Pai G. A. V.,”Neural Networks, Fuzzy Logic and Genetic Algorithms”, PHI, 2012.
2. Jang S.R., Sun C.T. and Mizutani E. “Neuro-Fuzzy and Soft Computing “, Pearson Education, New Delhi, 2004.
3. Davis E.Goldberg,”Genetic Algorithms:Search, Optimization and Machine Learning”, Addison Wesley, NewYork, 2003.
4. Ross, Timothy J.,Fuzzy Logic with Engineering Applications”, Tata McGraw-Hill, New York, 1997.

Course Outcomes:

On completion of the course the students will be able to

- recognize the feasibility of applying a soft computing methodology for a particular problem
- apply neural networks to pattern classification and regression problems
- apply fuzzy logic and reasoning to handle uncertainty and solve engineering problems
- apply genetic algorithms to combinatorial optimization problems
- compare solutions by various soft computing approaches for a given problem

UNIT – I**9**

Automata theory: Strings, Alphabet, Language, Operations, finite state automata , acceptance of strings, and languages, transition diagrams and Language recognizers, deterministic finite state automata and non deterministic finite automats Finite Automata with Epsilon transitions.

UNIT – II**9**

Regular Expressions and Languages: Regular expression–FA and regular expressions –Proving languages not to be regular–Closure properties of regular languages–Equivalence and minimization of automata

UNIT– III**9**

Context-Free Languages and Pushdown Automata: Context-Free Languages - Pumping Lemma for CFL – Parse trees–Ambiguity in grammars and languages – Definition of the pushdown automata –Languages of a pushdown automata –Equivalence of pushdown automata and CFG

UNIT– IV**9**

Turing Machines: Turing Machine, design of TM, Computable functions, recursively enumerable languages. Church’s hypothesis, types of Turing machines (proofs not required), TM and Halting, Programming techniques to TM.

UNIT – V**9**

Undecidability: A language that is not Recursively Enumerable (RE) –An undecidable problem that is RE–Undecidable problems about Turing machine –Post’s correspondence problem-The classes P and NP -Kruskal’s algorithm –The traveling salesman problem.

TOTAL: 45**REFERENCE BOOKS:**

1. Hopcroft J. E., Motwani R. and Ullman J. D., “Introduction to Automata Theory, Languages and Computations”, 3rd Edition, Pearson Education, New Delhi, 2008.
2. Martin J., “Introduction to Languages and the Theory of Computation”, 4th Edition, Tata McGraw-Hill, New Delhi, 2010.
3. Lewis H.R. and Papadimitriou C.H., “Elements of the Theory of Computation”, 2nd Edition, Pearson Education, New Delhi, 2007.

Course Outcomes:

On completion of the course the students will be able to

- describe and transform regular expressions and grammars
- understand the regular and context-free languages
- analyse and design finite automata, pushdown automata, turing machines and know about their capabilities
- demonstrate their understanding of key notions such as algorithm, computability, decidability and complexity through problem solving
- gain knowledge about the Church-Turing thesis

14MCO01 BUSINESS INTELLIGENCE AND ITS APPLICATIONS

3 0 0 3

UNIT – I

9

Introduction to Business Intelligence: Business Intelligence and Information Exploitation – The Value of Business Intelligence: Horizontal – Vertical use cases for BI – Planning for Success.

UNIT – II

9

BI Environment and Processes: The Business Intelligence Environment: Platform and Strategy – Framework - Business Processes and Information Flow – Data Requirement Analysis: Metrics – Analysis.

UNIT – III

9

BI Architecture and Data Profiling: Data Warehouse and Technical Business Intelligence Architecture: Data Modeling and Analytics – Data warehouse – Platform – Data Stores – Metadata: Types – Processes - Data Profiling: Attribute – Relationship Analysis.

UNIT – IV

9

Business Rule and Data Integration: Business Rules: Values – Definition – Sources – Data Quality: Types of Data Flaws – Assessment – Rules – Cleansing – Data Integration: ETL – Data Latency – Replication – Merge/Purge – Record Consolidation.

UNIT – V

9

Emerging Trends in BI: High Performance Business Intelligence – Collections of Data – Knowledge Discovery and Data Mining for Predictive Analytics – Emerging Business Intelligence trends.

TOTAL: 45

REFERENCE BOOKS:

1. Loshin David, “Business Intelligence – The Savvy Manager’s Guide”, 2nd Edition, Morgan Kaufmann Publishers, 2013.
2. Cindi Howson, “Successful Business Intelligence”, 2nd Edition, McGraw Hill Company, 2014.
3. Larson Brain, “Delivering Business Intelligence with Microsoft SQL Server 2008”, McGraw Hill Company, 2009.

Course Outcomes:

On completion of the course the students will be able to

- master in the business intelligence concepts
- familiarize the environment and architecture of business intelligence
- understand the profiling of data in business intelligence
- familiarize the basic knowledge of performance in BI
- understand the emerging trends in business intelligence

14MCO02 MOBILE APPLICATION DEVELOPMENT

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UNIT – I

9

Introduction: Basic Concepts – Android development environment – Simple android Application – Android Application Design Essentials: Understanding the anatomy of android application – Application using android manifest file – Managing application resources.

UNIT – II

9

User Interface: Android User Interface Design essentials – Exploring user interface screen elements – Designing user interfaces with layouts – Drawing and working with layouts.

UNIT – III

9

Common Android APIs: Using Android data and storage APIs – Sharing Data between applications with content providers – Using android networking APIs – Using android web APIs – Using Location Based Services (LBS) APIs – Using Android Multimedia APIs.

UNIT – IV

9

Android Application Design Principles: Working with notifications – Working with services – Managing user accounts and synchronizing user data – Handling advanced user input – Targeting different device configurations and languages.

UNIT – V

9

Deployment: The Mobile Software Development Process – Designing and Developing bulletproof android applications – Testing android applications – Selling android application.

TOTAL: 45

REFERENCE BOOKS:

1. Lauren Darcey and Shane Conder, “Android Wireless Application Development”, 2nd Edition, Pearson Education, 2011.
2. Zigurd Mednieks, Laird Dornin, G, Blake Meike and Masumi Nakamura, “Programming Android”, 3rd Edition, O’Reilly, 2011.
3. Reto Meier and Wrox Wiley, “Professional Android 2 Application Development”, John Wiley & Sons, 2010.

Course Outcomes:

On completion of the course the students will be able to

- design and implement the user interfaces for mobile applications
- know the components and structure of a mobile development framework
- understand the process of developing software for the mobile
- use an appropriate application development to design, write and test small interactive programs for mobile devices
- create mobile applications involving data storage in SQLite data base

UNIT - I**9**

Digital Image Fundamentals: Elements of visual perception- Light and the Electromagnetic Spectrum- Image sensing and Acquisition- brightness- contrast- hue- saturation- mach band effect - Image sampling- Quantization - Basic relationship between pixels - Color image fundamentals - RGB- HSI models

UNIT – II**9**

Image Enhancement in the Spatial Domain: Basic Gray Level Transformations - Histogram Processing - Enhancement Using Arithmetic/Logic Operations-Smoothing Spatial Filters- Sharpening Spatial Filters

UNIT – III**9**

Image Enhancement in the Frequency Domain: Introduction to the Fourier Transform and the Frequency Domain- Smoothing Frequency-Domain Filters- Sharpening Frequency Domain Filters- Homomorphic Filtering

UNIT – IV**9**

Segmentation and Morphological Image Processing: Point- line and edge detection – Thresholding- Region-Based Segmentation- Dilation and Erosion - Basic Morphological Algorithms.

UNIT – V**9**

Image Compression and Representation: Need for data compression-Lossless compression- Lossy compression-compression standards. Image representation: chain codes – polygonal approximations – signatures – boundary segments – skeletons – Boundary descriptors - Regional descriptors- Applications of image processing.

TOTAL : 45**REFERENCE BOOKS:**

1. Rafael C. Gonzalez and Richard E. Woods, “Digital Image Processing”, 2nd Edition, Pearson Education, New Delhi, 2006.
2. Rafael C. Gonzalez, Richard E. Woods and Steven Eddins, “Digital Image Processing using MATLAB”, 2nd Edition, Gatesmark Publisher, 2009.
3. Jain Anil K.,”Fundamentals of Digital Image Processing”, Prentice Hall of India, New Delhi, 2002.
4. Kenneth R. Castleman, “Digital Image Processing”, Prentice Hall of India, New Delhi, 2006.
5. John C. Russ, “The Image Processing Handbook”, 5th Edition, Prentice Hall, New Jersey, 2002.

Course Outcomes:

On completion of the course the students will be able to

- understand how images are formed, sampled, quantized and represented digitally
- describe the fundamental concepts of digital image processing
- understand the need of image compression and its standards
- understand how images are enhanced to improve subjective perception
- understand various applications of image processing

UNIT – I**9**

Basic Administration and Software Management: Overview of a Linux System - Various parts of an operating system - Important part of the kernel - Major service in a UNIX system. Linux relationship to UNIX - Linux distributions - man pages - Essential tasks of system administrator-Basic Linux installation-Diskless Clients-Package Management-Revision Control.

UNIT-II**9**

Bootng and Access Control: Bootstrapping-Working with startup scripts-Rebooting and shutting down. Traditional access control-Modern Access Control.

UNIT– III**9**

File System: Controlling processes-The File System-pathnames-File system mounting and unmounting-Adding new users-Organization of the file tree-file types-File attributes-Access control list.

UNIT– IV**9**

Disk Management: Adding new users-disk interfaces-Disk geometry-Linux file systems-disk installation procedure – hdparm – fsck - Adding a disk-Advanced disk management-Mounting USB drives.

UNIT – V**9**

Users and Log files: Adding new users-Logging polices-Linux log files-logrotate: Manage log files.

TOTAL: 45**REFERENCE BOOKS:**

1. Evi Nemeth, Garth Snyder, Trent R Hein, Ben Whaley, “Linux Administration Handbook”, 2nd Edition, Pearson Education, 2009.
2. Lars Wirzenius, Joanna Oja, Stephen Stafford and Alex Weeks,” Linux System Administrators Guide”, 1st Edition, Tata , 2005.
3. Wale Soyinka, “Linux Administration: A Beginner’s Guide”, 5th Edition, Tata MCGraw Hill, 2008.
4. Steven Graham and Steve Shah, “Linux Administration A Beginners Guide”, 3rd Edition, Dreamtech Press, 2003.

Course Outcomes:

On completion of the course the students will be able to

- learn the basic administration concepts in linux
- know the fundamental commands for linux administration
- install Linux operating system and configure the disk
- gain knowledge in package management, booting and access control
- understand the file system and disk management