

**DEPARTMENT OF INFORMATICS
KAKATIYA UNIVERSITY, WARANGAL**

MCA COURSE STRUCTURE & SYLLABUS
(With effect from the academic year 2009-10)

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MCA I SEMESTER

Paper Code	Title	Workload Per Week		Marks		
		Theory	Practical	Internal	University	Total
MCA 111	Problem Solving and Programming	4	--	20	80	100
MCA112	Computer Organization	4	--	20	80	100
MCA 113	Discrete Mathematical Structures	4	--	20	80	100
MCA 114	Internet Technologies	4	--	20	80	100
MCA115	Managerial economics	4	--	20	80	100
MCA116	Problem Solving Lab	--	4		50	50
MCA117	Internet Tech Lab	--	4		50	50
MCA118	BDP Lab	--	4		50	50

MCA II SEMESTER

Paper Code	Title	Workload Per Week		Marks		
		Theory	Practical	Internal	University	Total
MCA121	Data Structures	4	--	20	80	100
MCA122	Object Oriented Programming	4	--	20	80	100
MCA123	System Software	4	--	20	80	100
MCA124	Operating Systems	4	--	20	80	100
MCA120	Probability and Statistics	4	--	20	80	100
MCA126	Data Structures Lab	--	4		50	50
MCA127	OOPS Lab	--	4		50	50
MCA128	OS & SYSTEM SOFTWARE LAB	--	4		50	50

MCA III SEMESTER

Paper Code	Title	Workload Per Week		Marks		
		Theory	Practical	Internal	University	Total
MCA211	Database management Systems	4	--	20	80	100
MCA212	Data Communication and Networks	4	--	20	80	100
MCA213	Software Engineering-I	4	--	20	80	100
MCA214	Principles of Management	4	--	20	80	100
MCA215	.NET Programming	4	--	20	80	100
MCA216	DBMS Lab	--	4		50	50
MCA217	Software Testing Lab	--	4		50	50
MCA218	.NET Lab	--	4		50	50

MCA IV SEMESTER

Paper Code	Title	Workload Per Week		Marks		
		Theory	Practical	Internal	University	Total
MCA221	Data Mining	4	--	20	80	100
MCA222	Unix Network Programming	4	--	20	80	100
MCA223	Advanced Java	4	--	20	80	100
MCA224	Software Engineering-II	4	--	20	80	100
MCA225	Accountancy and Financial Management	4	--	20	80	100
MCA226	Unix Network Programming Lab	--	4		50	50
MCA227	Mini Project	--	4		50	50
MCA228	Advance Java Lab	--	4		50	50

MCA V SEMESTER

Paper Code	Title	Workload Per Week		Marks		
		Theory	Practical	Internal	University	Total
MCA311	Artificial Intelligence	4	--	20	80	100
MCA312	Cryptography and Network Security	4	--	20	80	100
MCA313	Mobile Communications	4	--	20	80	100
MCA314*	Elective – I	4	--	20	80	100
MCA315*	Elective – II	4	--	20	80	100
MCA316	Multimedia & Rich Internet Applications Lab	--	4		50	50
MCA317	J2EE Lab	--	4		50	50
MCA318	GUI Programming with VC++ - lab	--	4		50	50

*** MCA314: Elective-I: Any one of the following has to be chosen**

MCA314-A: Design and Analysis of Algorithms

MCA314-B: Distributed Operating Systems

MCA314-C: e-Commerce

*** MCA315: Elective-II: Any one of the following has to be chosen**

MCA315-A: Design Patterns

MCA315-B: Cloud Computing

MCA315-C: Computer Graphics

MCA VI SEMESTER

Major Project Work	Marks
	150

Every college will conduct two internal Seminars in the sixth semester on the progress of the project work done by each student. The principal of the college would ensure that the student is permitted for the project viva only after the completion of these seminars.

KAKATIYA UNIVERSITY, WARANGAL
DEPARTMENT OF INFORMATICS
MODEL QUESTION PAPER

Max marks:80

Time: 3 Hours
Answer all questions

Answer any seven questions

8x2 = 16

1. a)
- b)
- c)
- d)
- e)
- f)
- g)
- h)

4x64 = 64

2. a)
- b)
- c)
- d)

UNIT-I

(OR)

3. a)
- b)
- c)
- d)

UNIT-II

(OR)

4. a)
- b)
- c)
- d)

UNIT-III

(OR)

5. a)
- b)
- c)
- d)

UNIT-IV

(OR)

MCA111: PROBLEM SOLVING AND COMPUTER PROGRAMMING

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT – I

INTRODUCTION TO COMPUTERS: Computer Systems, Computer Hardware, Computer Software, Computer environments, Computer Languages, System development.

INTRODUCTION TO C++ LANGUAGE: C++ programs, Data types, variables, constants, coding constants, expression precedence and associativity, mixed type expressions statements.

FUNCTIONS: Functions in C++, User defined functions, standard library functions, scope.

UNIT – II

SELECTION MAKING DECISIONS: Logical data and operators, two-way selection, multi-way selection.

Iteration: Concept of a loop, event –controlled and counter-controlled loops, loops in C++, Recursion.

TEXT I/O- Input O/P entities, Streams, Formatting input and output, character input/output functions, character input/output examples.

UNIT – III

ARRAYS: Arrays and functions, array application sorting, searching. POINTERS: Pointers and functions, pointers to pointers, pointer arithmetic and arrays, passing an array to a function.

CLASSES- Class objects, inline functions, static members, classes and pointers, structure, unions, enumerated types, the type definition.

INHERITANCE AND AGGREGATION: Inheritance, private, protected, public, manager functions and inheritance, overriding member functions, polymorphism, multiple inheritances.

UNIT – IV

TEMPLATES: Function templates, class templates, strings. EXCEPTION HANDLING:

Exception handling classes, exception specification, exception in classes, standard exception.

TEXT BOOK

A STRUCTURED APPROACH USING C++ BY B.A.FOROUZAN & RF GILBERG (THOMSON BUSINESS INFORMATION INDIA))

REFERENCE BOOKS

1. C++ HOW TO PROGRAM – BY DEITEL & DEITEL - (Addison Wesley)
2. INTRODUCTION TO COMPUTER SCIENCE BY - TREMBLEY AND BUNT - (McGraw-Hill)
3. TEACH YOURSELF C++ BY - HERBERT SCHILDT - (TMH)
4. THINKING IN C++ BY - BRUCE ECKEL - (Pearson Education, Second Edition)
5. STANDARD C++ WITH OBJECT-ORIENTED PROGRAMMING BY - PAUL S WANG - (VIKAS PUB.)
6. FUNDAMENTAL OF COMPUTING WITH C ++ BY - J.R. HUBBARD, SCHAUM'S SERIES
7. COMPLETE REFERENCE C ++ -BY- SCHILDT (TMH)
8. C++ PROGRAMMING, BY AL STEVENS WILEY, DREAM TECH
9. OBJECT OREINTED PROGRAMMING WITH C ++ BY - R. SUBBURAJ (VIKAS)
10. C ++ PROGRAMMING - BY - DS. MALLIK (THOMSON LEARNING)
11. C ++ PROGRAMMING -BY-HERBERT SCHILDT(DREAM TECH PRESS)
12. STARTING OUT WITH C ++ BY - TONY GADDIS (Dream Tech Press)
13. COMPUTING CONCEPTS WITH C ++ BY – HORSTMANN (WILEY)
14. <http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT-Delhi/intro%20to%20CS/new-slides.pdf> :
15. <http://nptel.iitm.ac.in/video.php?subjectId=106104074>

MCA112: COMPUTER ORGANIZATION

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT - I

LOGIC CIRCUITS : Basic Logic Functions, Synthesis of Logic Functions Using AND, OR, and NOT Gates, Minimization of Logic Expression, Synthesis with NAND and NOR Gates, Practical Implementation of Logic Gates, Flip-Flops, Registers and Shift Registers, Counters, Decoders, Multiplexers, Programmable Logic Devices (PLDs), Field-Programmable Gate Arrays, Sequential Circuits.

BASIC STRUCTURE OF COMPUTER HARDWARE AND SOFTWARE: Functional units, Basic operational concepts, Bus structures, Software, Performance, Distributed Computing.

ADDRESSING METHODS : Basic Concepts, Memory Locations, Main Memory Operations, Addressing Modes, Assembly Language, Basic I/O operations, Stacks and Queues, Subroutines.

(Chapter 1, 2.1 to 2.8, A.1 to A.13)

UNIT - II

PROCESSING UNIT: Some Fundamental Concepts, Execution of a Complete Instruction, Hardwired Control, Performance Considerations, Micro Programmed Control, Signed Addition and Subtraction, Arithmetic and Branching Conditions, Multiplication of Positive Numbers, Signed-Operand Multiplication, Fast Multiplication, Integer Division, Floating-Point Numbers and Operations.

(Chapter 3, 6.4 to 6.10)

UNIT - III

INPUT-OUTPUT ORGANIZATION: Accessing I/O Devices, Interrupts, Processor Examples, Direct Memory Access, I/O Hardware, Standard I/O Interfaces, The Motorola 680X0 Family, The Intel 80X86 Family, The Power PC Family, The Alpha AXP Family, Architectural and Performance Comparisons, A Stack Processor.

(Chapter 4, 8.1 to 8.6)

UNIT - IV

MEMORY: Semiconductor RAM memories, Read-Only Memories, Cache Memories, Performance Considerations, Virtual Memories, Memory Management Requirements.

INTRODUCTION TO COMPUTER PERIPHERALS: I/O Devices, On-Line Storage. (Chapter 5, 9.1, 9.2)

TEXT BOOK

- 1 COMPUTER ORGANIZATION, TMH (IV EDITION) BY V.C. HAMACHER

REFERENCE BOOK

- 1 COMPUTER ORGANIZATION, (PHI) By MORIS MANO
- 2 COMPUTER ARCHITECTURE & ORGANISATION By HAYES, (TMH)
- 3 COMPUTER SYSTEMS ORGANISATION & ARCHITECTURE By CARPINELLI, (ADDISON WESLEY)
- 4 THE ARCHITECTURE OF COMPUTER HARDWARE AND SYSTEMS HARDWARE BY I ENGLANDER (WILEY)
- 5 COMPUTER SYSTEMS DESIGN AND ARCHITECTURE BY VP HEURING, HF JORDAN (PEARSON)
- 6 <http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT-KANPUR/CompArchitecture/page1.htm>
- 7 <http://nptel.iitm.ac.in/video.php?subjectId=106106092>
- 8 http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT-%20Guwahati/comp_org_arc/web/index.htm

MCA113: DISCRETE MATHEMATICS

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT – I

FUNDAMENTALS: Sets, Relations and functions, Fundamentals of logic, Logical inferences, First order logic, Quantified propositions, Mathematical induction.

ELEMENTARY COMBINATORICS: Combinations and Permutations, Enumeration - with repetitions, with constrained repetitions, The Principle of Inclusion - Exclusion.
(Chapter 1-2)

UNIT –II

RECURRENCE RELATIONS: Generating functions, Coefficients of Generating functions, Recurrence Relations, Inhomogeneous Recurrence Relations
(Chapter-3)

UNIT – III

RELATIONS AND DIAGRAMMS: Relations and diagrams, Binary relations, Equivalence relations, Ordering relations, Lattices, Paths and Closures, Directed graphs, Adjacency matrices - Applications, Sorting and Searching
(Chapter - 4)

UNIT – IV

GRAPHS: Graphs, Isomorphism, Trees, Spanning trees, Binary trees, Planar graphs, Euler Circuits, Hamiltonian graphs, Chromatic numbers, Four-colour problem, Network flows. (Chapter 5)

TEXT-BOOK

- 1 Discrete Mathematics For Computer Scientists, (Chapter 1-5) BY J L MOTT, A KANDEL AND T P BAKER

REFERENCE BOOKS

- 2 DISCRETE MATHEMATICAL STRUCTURE - (TMH) BY TREMBLEY AND MANOHAR
- 3 DISCRETE MATHEMATICS WITH ALGORITHMS - (JOHN WILEY) BY M.O.ALBERTSON AND J.P.HUTCHINSON
- 4 ELEMENTS OF DISCRETE MATHEMATICS-(TMH, SECOND EDITION) BY C.L.LIU
- 5 DISCRETE MATHEMATICS - (PHI, THIRD EDITION) BY BURNORD KOLMAN
- 6 DISCRETE MATHEMATICS BY KH ROSSEN (TMH)
- 7 DISCRETE MATHEMATICS BY S LIPSCHUTZ AND M. LIPSON SCHAUM'S GEN (TMH)
- 8 DISCRETE MATHEMATICS FOR COMPUTER SCIENCE BY GARRRY HAGGARD, J. SCHILPF & S WHITE SIDES (THOMSON PRESS)
- 9 DISCRETE & COMBINATORIAL MATHEMATICS BY RALPH P GRIMALDI (PEARSON EDUCATION)
- 10 DISCRETE MATHEMATICAL STRUCTURES BY DS MALLIK & M K SEN (THOMSON PRESS)

MCA114: INTERNET TECHNOLOGIES

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT – I

HTML- Basic HML, The document body, Text, Hyperlinks, Adding More Formatting, Lists, Using Color and Images, Images, Tables, Frames, Forms-Toward Interactivity.

Cascading Style sheets – Introduction, Inline Styles, Embedded Style Sheets, Linking external sheets, Backgrounds, text flow and box model.

(Text Book 1 chapters 4, 5 and 6)

UNIT – II

JavaScript- Introduction, simple programming, Obtaining User Input with prompt Dialogs, Operators (arithmetic, Decision making, assignment, logical, increment and decrement)

Control Structures - if... else selection statement, while, do... while repetitions statement, for statement, switch statement, break and continue statements.

Functions – program modules in JavaScript, programmer defined functions, function definition, Random-number generator, scope rules, global functions, recursion, JavaScript: Arrays.

(Text Book 1 chapters 7, 8, 9 and 10)

UNIT – III

JavaScript: Objects – Math Object, String Object, Date Object, Boolean & Number Object, document and window Objects.

Event Model – onclick, onload, onerror, onmouseover, onmouseout, on focus, onblur, onsubmit, onreset, more DHTML events.

Filter and Transitions – flipv, fliph, chroma, masks, invert, gray, xray, shadow to text, alpha, glow, wave, dropshadow, light, blendTrans, revealTrans.

(Text Book 1 chapters 11, 12, 14 and 15)

UNIT – IV

PHP – Introduction to PHP, including PHP in a page, Data Types, program control, Arrays, User-defined functions, Built-in Functions, regular expression, using files. Building Web Applications with PHP-tracking users, using databases.

Handling xml. Introduction, XML Basics, Structuring Data, XML Namespaces, Document Type Definitions (DTDs), W3C XML Schema Documents, XML Vocabularies, MathML, Other Markup Languages, Extensible Style sheet Language and XSL Transformations, Document Object Model (DOM).

(PHP from Text Book 2 chapters 7, XML from Text Book 1 chapter No. 20)

TEXT BOOKS

1. Internet & World Wide Web- H. M. Deitel, P.J. Deitel, A. B. Goldberg-Third Edition
2. Web Programming –Chris Bates – Third edition.(Wiley)

REFERENCE BOOKS

1. Programming World Wide Web by RW Sebesta (Pearson)
2. An Introduction to Web Design+Programming by Wang & Katia(Pearson)
3. HTML & XML An Introduction NIIT(PHI)
4. HTML for the WWW with XHTML & CSS by Wlizabeth Castro(Pearson)
5. Fundamentals of the Internet an the World Wide Web by Raymond Green Law and Ellen Hepp (TMH)
6. Internet and Web Technologies by Raj Kamal (TMH)
7. Internet and Web Basics by Ned Snell, Bob Temple, TM Clark (Pearson)
8. <http://nptel.iitm.ac.in/video.php?subjectId=106105084>

MCA115: MANAGERIAL ECONOMICS

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT - I

INTRODUCTION: Nature and Scope of Managerial Economics - Fundamental Concepts used in Managerial Economics - Methods of Economic Analysis for Managerial Decision Making - Objectives of a firm - Profit Maximization VS Wealth Maximization.

UNIT - II

CONSUMER BEHAVIOR AND DEMAND ANALYSIS: The theory of consumer behavior - Concept of utility - Marginal utility Analysis - Consumer surplus - Indifference curve analysis. Concept of demand - Law of demand - Demand determinants - Elasticity of demand - Types - Measurement of elasticity of demand - Types - Measurement of Elasticity of demand - Demand forecasting.

UNIT - III

PRODUCTION ANALYSIS: Laws of Production - The production function - ISO cost and ISO quant curves - Equilibrium of the firm and industry - Choice of optimal combination of factors of production - Choice of optimal expansion path - The law of supply - Derivation of supply curve - Market analysis - Pricing under various competitive situations.

UNIT - IV

National income analysis/ Measurement/ Growth rates Indian economy, Planning and development in India - Development strategies - Five Year Plans - Poverty - Food & Population problems. Break even Analysis.

TEXT BOOKS

1. MANAGERIAL ECONOMICS (UNIT - I, II, III) BY VARSHNEY & MAHESHWARI
2. INDIAN ECONOMY - (UNIT - IV) BY MISHRA & PURI

REFERENCE BOOKS

1. JOEL DEAN - MANAGERIAL ECONOMICS
2. P.L. MEHTA - MANAGERIAL ECONOMICS
3. TREVETT - MANAGERIAL ECONOMICS (WILEY)
4. MANAGERIAL ECONOMICS BY PETERSEN (PEARSON)

MCA116: PROBLEM SOLVING - LAB

Workload: 4 PPW

Marks: University Exam – 50

1. Simple Data Types.
2. Control Structures - Alternation and Iteration.
3. Arrays - Strings and Matrix manipulations.
4. Functions.
5. Parameter passing.
6. Recursion - Direct and Indirect recursion.
7. Records.
8. Classes
9. Templates & Other Topics Covered in Paper – I
10. File Processing.

(All the Programs from Text Book including exercises must be practiced)

MCA117: INTERNET TECHNOLOGIES - LAB

Workload: 4 PPW

Marks: University Exam – 50

1. Create a simple HTML page which demonstrates all types of lists.
2. Create a letter head of your college using following styles
 - i. image as background
 - ii. use header tags to format college name and address
3. Create a web page, which contains hyper links like fruits, flowers, animals. When you click on hyper links, it must take you to related web page, these web pages must contain with related images.
4. Create a hyperlink to move around within a single page rather than to load another page.
5. Create a leave letter using different text formatting tags.
6. Create a table format given bellow using rowspan and colspan.

RNO	NAME	MARKS				
		M1	M2	M3	M4	M5

Insert 5 records.

7. Create a table with different formats as given bellow.
 - i. give different background and font colors to table header, footer and body.
 - ii. Use table caption tag.
8. Divide a web page vertically and horizontally with scroll bars, name them as shown bellow decorate it with some items.

F1	F2
	F3

9. Divide a web page as shown bellow.

"F1" Course: <u>PG</u> <u>UG</u>	"F2" <<show here different courses provided by UG & PG on clicking hyperlinks>>
---	--

10. Create a student Bio-Data, using forms.
11. Create a web page using following style sheets
 - i. Inline style sheets.
 - ii. Embedded style sheets.
 - iii. External style sheets
12. Create a web page using "class" style sheets with different "border-width" property values like *thick, medium, thin, groove, inset, outset, red & blue*.
13. Accept marks from bellow form, calculate total and average, results must be shown in alert box.

M1:	M1 textbox
M2:	M2 textbox
M3:	M3 textbox
M4:	M4 textbox
Total button	
Avg button	

14. Write a JavaScript program to accept name and index of name character from prompt box, convert name into uppercase and display name and index char in dialog box.
15. Write a JavaScript program to accept two values from form and apply any 5 mathematical functions.
16. Display the current date and time in both GMT and local form.
17. Write a javascript program onmouseover, onmouseout & onblur events.
18. Write a XML program using document type definitions
19. Write student database with XML.
- 20 Write a XML program using XS

1. Write a PHP program to Display "Hello"
2. Write a PHP Program to display the today's date.
3. Write a PHP Program to read the employee details.
4. Write a PHP Program to display the
5. Write a PHP program to prepare the student marks list.
6. Write a PHP program to generate the multiplication of two matrices.
7. Write a PHP Application to perform demonstrate the college website.
8. Write a PHP application to add new Rows in a Table.
9. Write a PHP application to modify the Rows in a Table.
10. Write a PHP application to delete the Rows from a Table.
11. Write a PHP application to fetch the Rows in a Table.
12. Develop an PHP application to make following Operations
 - i. Registration of Users.
 - ii. Insert the details of the Users.
 - iii. Modify the Details.
 - iv. Transaction Maintenance.
 - a) No of times Logged in
 - b) Time Spent on each login.
 - c) Restrict the user for three trials only.
 - d) Delete the user if he spent more than 100 Hrs of transaction.
 - e)

(All the Programs from Text Book including exercises must be practiced in addition to the above exercises)

MCA118: BUSINESS DATA PROCESSING - LAB

Workload: 4 PPW

Marks: University Exam – 50

- 1 Sequential file processing Transaction and Master files/ Batch processing.
- 2 Direct Access files (indexed & relative)/ inter active/On line updation
- 3 Creation and Updation of Sequential, Indexed and Relative Files
- 4 Report writer Programs.
- 5 Screen Features/ Interactive Programs.
- 6 Sub Programs

(All the programs from the given text book must be practiced)

TEXT BOOK

1. STRUCTURED COBOL PROGRAMMING BY – STERN & STERN (WILEY)

ADDITIONAL BOOK

PROGRAMMING IN COBOL BY – ROY DASTIDAR (TMH)

REFERENCE BOOK

PC HARDWARE: THE COMPLE REFERENCE- BY ZACKER, CRAIQ PUBLISHER:TATA MCGRAW HILLS

MCA121: DATA STRUCTURES

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT – I

Introduction: The Abstract Data Type – A Model for an Abstract Data Type – Algorithm Efficiency.

Searching: List Searches – C ++ Search Algorithms – Hashed List Searches – Collision Resolution.

Linked Lists: Linear List Concepts – Linked List Concepts – Linked List Algorithms – Processing a Linked List – Circularly Linked Lists – Doubly Linked Lists – List Abstract Data Type-Linked List Implementation.

Stacks: Basic Stack Operations – Stack Linked List Implementation – Stack Applications – Stack ADT-Array Implementation. (Chapters 1,2, 3.4)

UNIT - II

Queues: Queue Operations – Queue Linked List Design – Queue Applications – Queue ADT-Linked List Implementation – Queue ADT-Array Implementation.

Recursion: Designing Recursive Algorithms – The Towers of Hanoi – C ++ Implementations of Recursion.

Introduction to Trees: Binary Trees – Binary Tree Traversals – Expression Trees – General Trees.

Search Trees: Binary Search Trees.AVL Trees and their implementation (Chapters 5 to 8,)

UNIT - III

Heaps: Heap Definition – Heap Structure – Basic Heap Algorithms – Heap Data Structure – Heap Algorithms – Heap Applications.

Multway Trees: m-way Search Trees – Simplified B-Trees-B tree Variations.

Advanced Sorting Concepts: General Sort Concepts – Insertion Sorts – Selection Sorts – Exchange Sorts – External Sorts.

Graphs: Operations – Graph Storage Structures – Graph Algorithms. (Chapters 9, 10, 11, 12 of 1st Text Book)

UNIT – IV

Algorithm Design Techniques: Greedy Algorithms -- Divide and Conquer –Dynamic Programming – Ordering Matrix Multiplications – Backtracking Algorithms (Chapters 10.1, 10.2, , 10.3, 10.5, of 2nd Text Book)

TEXT BOOKS

- 1 DATA STRUCTURES A PSEUDOCODE APPROACH WITH C ++ BY – RICHARD F. GILBERG. BEHROUZ A. FOROUZAN (THOMSON PRESS)
- 2 DATA STRUCTURES & ALGORITHM ANALYSIS IN C ++ BY – MARK ALLEN WEISS.

REFERENCE BOOKS

- 1 Sartaj Sahni, Data Structures, Algorithms, and Applications in C ++ , TMH
- 2 Michael Main Walter Savitch, Data Structures and Other Objects Using C ++, Pearson.
- 3 Michael T. Goodrich Roberto Tamassia David Mount, Data Structures and Algorithms, in C ++, John wiley & Sons.
- 4 Ellis Horowitz Sartaj Shani Dinesh Mehta, Fundamentals of Data Structures in C ++, Galgotia.
- 5 Bruno R. Preiss, Data Structures and Algorithms with Object – Oriented Design Patterns in C ++, John wiley & Sons.
- 6 <http://nptel.iitm.ac.in/video.php?subjectId=106102064>
- 7 http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT-%20Guwahati/data_str_algo/frameset.htm

MCA122: OOPS WITH JAVA

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT - I

Object - Oriented Thinking: Messages and Methods – Classes and Instances – Class Hierarchies – Inheritance – Method Binding, Overriding, and Exceptions.

A Brief History of Object – Oriented Programming: The History of Java – Client – Side Computing – Java Language Description

Object – Oriented Design: RDD – CRC cards – Components and Behavior – Software Components – Formalizing the Interface – Implementing components Integration of Components.

Understanding Paradigms: Program Structure – Types – Access Modifiers – Lifetime Modifiers. (Chapters 1 to 4)

UNIT – II

Data Fields – Constructors – Inheritance – The Java Graphics Model – Multiple Objects of the Same Class. Adding User Interaction – Inner Classes – Interfaces – The Java Event Model – Window Layout.

Understanding Inheritance: An Intuitive Description of Inheritance – Subclass, Subtype, and Substitutability – Forms of Inheritance – Modifiers and Inheritance – The Benefits of Inheritance – The Costs of Inheritance.

Mechanisms for Software Reuse: Substitutability –Combining Inheritance and Composition – Dynamic Composition.

(Chapters 5, 6, 8, 10)

UNIT - III

Implications of Inheritance: The Polymorphic Variable – Assignment – Equality Test – Garbage Collection.

Polymorphism: Polymorphic Variables – Overloading – Overriding – Abstract methods – Pure Polymorphism.

Input and Output Streams: Input Streams – Output Streams – Object serialization – Piped Input and Output – Readers and Writers.

Exception Handling: Information Transmitted to the Catch Block – The Finally Clause – Throwing Exceptions – Passing on Exceptions.

(Chapters 11,12,14,16)

UNIT – IV

The AWT : The AWT Class Hierarchy – User Interface Components – Panels – Dialogs.

Understanding Graphics: Color – Rectangles – Fonts – Images.

Multiple Threads of Execution: Creating Threads – synchronizing Threads.

Collection Classes – Multiple Threads of Execution – Exception Handling.

Applets and Web Programming: Applets and HTML – Security Issues – Applets and Applications – Obtaining Resources Using an Applet – Combining Applications and Applets.

(Chapters 7, 13, 18, 20, 21)

TEXT BOOK

- 1 UNDERSTANDING OBJECT-ORIENTED PROGRAMMING WITH JAVA BY – TIMOTHY BUDD (PEARSON)

REFERENCE BOOKS

1. THE COMPLETE REFERENCE JAVA 2 (Fourth Edition) BY - PATRICK NAUGHTON & HERBET SCHILD (TMH)

2. PROGRAMMING JAVA - DECKER&HIRSH FIELD VIKAS PUBLISKING (2001)
(THOMSON LEARNING) (SECOND EDITON)
3. INTRODUCTION TO JAVA PROGRAMMING - Y.DANIEL LIANG PHI(2002)
4. OBJECT ORIENTED PROGRAMMING THROUGH JAVA 2 BY - THAMUS WU (Mc.Graw Hill)
5. JAVA 2 - DIETEL & DIETEL (PEARSON EDUCATION)
6. INTRODUCTION TO JAVA – BALA GURU SWAMY
7. INTRODUCTION TO PROGRAMMIND & OOD USING JAVA – JAINO NINE & FA HOSCH (JOHN WILEY)
8. STARTING OUT WITH JAVA – JONY GADDIS (DREAM TECH PRESS)
9. JAVA PROGRAMMING – SCHAUM’S SERIES
10. OBJECT ORIENTED APPLICATION DEVELOPMENT USING JAVA – ER DOXE ETC. (THOMSON PRESS)
11. THINKING IN JAVA –BY – BRUCE ECKEL (PEARSON)
12. PROGRAMMING & PROBLEM SOLVING WITH JAVA – JM SLACK (THOMSON)
13. COMPUTING CONCEPTS WITH JAVA2 ESSENTIALS - CAY HORSTMANN (JOHNWILEY)
14. JAVA PROGRAMMING ADVANCED TOPICS – J WIGGLESWORTH, P LUMBY (THOMSON LEARNING)
15. <http://nptel.iitm.ac.in/syllabus/syllabus.php?subjectId=106106110>

MCA123: SYSTEM SOFTWARE

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT – I

SYSTEMS PROGRAMMING: Assemblers Overview – Global Structure, .Stack Segment, .Data Segment, .Code Segment. Arithmetic – Addition, Subtraction, Multiplication, Division, Comments. Comparing and Branching – Decision making in Assembly, Unsigned Conditional jumps, Flags, Loops, Reading single characters. Sub programs-procedures. Macros – Declarations, Expansion, Parameters, Local Symbols, Parameter Separator, Assembly Listing. (CHAPTERS 2,4,5,6,7,8 text book2)

UNIT – II

BACKGROUND: Introduction, System Software and Machine Architecture, The Simplified Instructional Computer (SIC), SIC Machine Architecture, SIC/XE Machine Architecture, SIC Programming Examples, Traditional (CISC) Machines, VAX Architecture, Pentium Pro Architecture, RISC Machines, Ultra SPARC Architecture, Power PC Architecture, Cray T3E Architecture.

ASSEMBLERS: Basic Assembler Functions, A Simple SIC Assembler, Assembler Algorithm and Data Structures, Machine-Dependent Assembler Features, Instruction Formats and Addressing Modes, Program Relocation, Machine-independent Assembler Feature, Literals, Symbol-Defining Statements, Expressions, Program Blocks, Control Sections and Program Linking, Assemblers Design Options, One-Pass Assemblers, Multi-Pass Assemblers, Implementation Examples, MASM Assembler, SPARC Assembler, AIX Assembler. (Chapters 1, 2 of text book1)

UNIT – III

LOADERS AND LINKERS: Basic Loader Functions, Design of an Absolute Loader, A Simple Bootstrap Loader, Machine-Dependent Loader Features, Relocation, Program Linking, Algorithm and Data Structures for a Linking Loader, Machine-Independent Loader Features, Automatic Library Search, Loader Options, Loader Design Options, Linkage Editors, Dynamic Linking, Bootstrap Loaders, Implementation Examples, MS-DOS Linker, SunOS Linkers, Cray MPP Linker. (Chapters 3 of text book1)

UNIT – IV

MACRO PROCESSOR: Basic Macro processor Functions, Macro Definition and Expansion, Macro Processor Algorithm and Data Structures, Machine-Independent Macro Processor Features, Concatenation of Macro Parameters, Generation of Unique Labels, Conditional Macro Expansion, Keyword Macro Parameters, Macro Processor Design Options, Recursive Macro Expansion, General-Purpose Macro Processors.

COMPILERS: Compiler Functions, Grammars, Lexical Analysis, Syntactic Analysis, Code Generation, Machine-Dependent Compiler Features, Intermediate Form of the Program, Machine-Dependent Code Optimization, Machine-Independent Compiler Features, Structured Variables, Machine-Independent Code Optimization, Storage Allocation, Block-Structured Languages, Compiler Design Options, Division into Passes, Interpreters, P-Code compilers, Compiler-Compilers. (Chapters 4, 5 of text book 1)

TEXT BOOK

1. SYSTEM SOFTWARE AN INTRODUCTION TO SYSTEMS PROGRAMMING -By LELAND L. BECK
2. ASSEMBLY LANGUAGE PROGRAMMING FOR THE IBM PC FAMILY- WILLIAM B JONES (DREAMTECH)

REFERENCE BOOKS

1. SYSTEM SOFTWARE AND OPERATING SYSTEMS -By DHAMDHERE - TMH 2nd Edition
2. SYSTEM PROGRAMMING - DONOVON

MCA124: OPERATING SYSTEMS

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT - I

INTRODUCTION: What is an Operating Systems?, Mainframe Systems, Desktop Systems, Distributed Systems, Real-Time Systems, Handheld Systems, Feature Migration, Computing Environments.

COMPUTER-SYSTEM STRUCTURES: Computer-System Operation, I/O Structure, Storage Structure, Hardware protection, Network Structure.

OPERATING SYSTEM STRUCTURE: System Components, Operating System Services, System Calls, System Programs, System Structure, Virtual Machines, System Design and Implementation.

PROCESSES: Process Concept, Process Scheduling, Operations on Processes, Cooperating Processes, Interprocess Communication, communication in Client-Server Systems.

THREADS: Multithreading Models Pthreads, Solaris 2 threads, Window 2000 threads, Linux Threads, Java Threads.

(Chapters 1, 2, 3, 4 and 5)

UNIT - II

CPU SCHEDULING: Basic concepts, Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling, Real-Time Scheduling, Process Scheduling Models.

PROCESS SYNCHRONIZATION: Background, The Critical-Section Problem, synchronization Hardware, Semaphores, Critical Regions, Monitors, OS Synchronization.

DEADLOCKS: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection.

MEMORY MANAGEMENT: Background, Swapping, Contiguous Memory Allocation, Paging, Segmentation.

(Chapters 6, 7, 8 and 9)

UNIT - III

VIRTUAL MEMORY: Background, Demand Paging, Process Creation, Page Replacement, Allocation of Frames, Thrashing.

FILE SYSTEM INTERFACE: File Concept, Access Methods, Directory Structure, File-System Mounting, File Sharing.

FILE-SYSTEM IMPLEMENTATION: File-System Structure, File-system Implementation, Directory Implementation, Allocation Methods, Free-Space Management, Efficiency and Performance, Recovery.

(Chapters 10, 11 and 12)

UNIT - IV

I/O SYSTEMS: I/O Hardware, Application I/O Interface, Kernel I/O Subsystem, Transforming I/O to Hardware Operations, STREAMS.

MASS-STORAGE STRUCTURE: Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, RAID Structure, Disk Attachment, Stable-Storage Implementation.

PROTECTION: Goals of Protection, Domain of Protection, Access Matrix, Implementation of access Matrix, Revocation of Access Rights, Capability-Based Systems.

SECURITY: The Security Problem, User Authentication, Program Threats, System Threats, Securing Systems and Facilities, Cryptography.

(Chapters 13, 14, 18 and 19)

TEXT BOOK

1. OPERATING SYSTEM CONCEPTS (6th Edition) By - SILBERSCHATZ, GALVIN, GAGNE Jhon-Wiley (2002)

REFERENCE BOOKS

1. OPERATING SYSTEMS (IV Edition) By - William Stallings PHI (2002)
2. OPERATING SYSTEMS By - GARY NUTT (Pearson Education)
3. OPERATING SYSTEMS By - CHARLES CROWLEY TMH (2000)
4. MODERN OPERATING SYSTEMS By - A.S. TANENBAUM (PHI) (2002)
5. OPERATING SYSTEMS BY – DM DHAMDHERE (TMH)
6. UNDER STANDING OPERATING SYSTEMS BY – IM FLYNN, AM MCHOCS (THOMSON PRESS)
7. OPERATING SYTEMS – DIETEL (PEARSON)
- 8.

MCA125: PROBABILITY AND STATISTICAL METHODS

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT - I

INTRODUCTION TO STATISTICS: Data Collection and Tabulation, Graphical Representation of Data Measures of Central Tendency and Dispersion, Moments, Skewness and Kurtosis.

PROBABILITY: Basic Concepts and Terms, Probability Distribution Functions : Uniform, Binomial, Poisson, Mathematical Expectation, Normal and X² Distributions.

UNIT - II

CORRELATION AND REGRESSION: Correlation Coefficient, Bivariate Correlation, Karl Pearsons Formula, Rank Correlation, Regression. Linear Regression Equations, Regression Coefficient - Multiple-Correlation. Analysis of Variance and Regression Analysis.

UNIT - III

TESTING OF STATISTICAL HYPOTHESIS: X² Tests for Variance, Tests for Mean of a Single Sample, Two Sample Means some tests based on F Distribution.

UNIT - IV

ANALYSIS OF VARIANCE: One Way Classification, Two Way Classification, Statistical Analysis of Data.

TEXT BOOK

1. FUNDAMENTALS OF APPLIED STATISTICS – BY - GUPTA AND KAPOOR

REFERENCE BOOKS

1. FUNDAMENTAL OF MATHEMATICAL STATISTICS BY - V K KAPOOR AND GUPTA SC
2. STATISTICS (PHI) BY - FREUD
3. PROBABILITY STATISTICS AND RANDOM PROCESS BY - R VEERA RAJAN (TMH)
4. INTRODUCTION TO PROBABILITY & STATISTICS BY - J.S. MILTON & JC ARNOLD (TMH)
5. MILLER & FERUNDS PROBABILITY & STATISTICS FRO ENGINNER BY - JOHNSON (PEARSON)
6. PROBABILITY & STATISTICS FRO ENGINEERS & STATISTICSTS BY - WALPOSE (PEARSON)

MCA126: DATA STRUCTURES – LAB

Workload: 4 PPW

Marks: University Exam – 50

1. Write C ++ Programs to implement the following using an array.
 - a) Stack ADT
 - b) Queue ADT
2. Write C ++ programs to implement the following using a singly linked list.
 - a) Stack ADT
 - b) Queue ADT
3. Write C ++ program to implement the deque (double ended queue) ADT using a doubly linked list
4. Write a C ++ Program to perform the following operations.
 - a) Insert an element into a binary search tree.
 - b) Delete an element from a binary search tree.
 - c) Search for a key element in a binary search tree.
5. Write a C ++ program to implement circular queue ADT using an array.
6. Write C ++ programs that traverse the given binary tree in.
 - a) Preorder
 - b) Inorder and
 - c) Postorder.
7. Write a C ++ programs for the implementation of bfs and dfs for a given graph.
8. Write C ++ programs for implementing the following sorting methods.
 - a) Quick sort
 - b) Merge sort
 - c) Heap sort
 - d) Selection sort
 - e) Exchange sort
 - f) Insertion sort.
9. Write a C ++ program to perform the following operations.
 - a) Insertion into a 2-3 tree
 - b) Deletion from a 2-3 tree
10. Write C ++ programs to implement
 - a) Sequential
 - b) Binary search
11. Implement converts of infix expressions to post fix notation simple expression evaluator that can handle +, -, /, *.
12. String Operations using Linked lists.
13. Polynomial Operations using Linked lists.
14. Graph operations , traversal, , searching , traversing and other related problems
(All the exercises from the text book must be solved in addition to the above)

MCA127: OOPS WITH JAVA - LAB

Workload: 4 PPW

Marks: University Exam – 50

1. Programs to illustrate constructors.
2. Programs to illustrate Overloading & Overriding methods in Java.
3. Programs Illustrate the Implementation of Various forms of Inheritance. (Ex. Single, Hierarchical, Multilevel inheritance....)
4. Program which illustrates the implementation of multiple Inheritance using interfaces in Java.
5. Program to illustrate the implementation of abstract class.
6. Programs to illustrate Exception handling
7. Programs to create packages in Java.
8. Program to Create Multiple Threads in Java.
9. Program to Implement Producer/Consumer problem using synchronization.
10. Program to Write Applets to draw the various polygons.
11. Create and Manipulate Labels, Lists, Text Fields, Text Areas & Panels
12. Handling Mouse Events & Keyboard Events.
13. Using Layout Managers.
14. Create & Manipulate the Following Text Areas, Canvas, Scroll bars, Frames, Menus, Dialog Boxes.
15. Programs, which illustrate the manipulation of strings.
 - a. Ex. 1. Sorting an array of Strings.
1. Frequency count of words & Characters in a text.
16. Programs, which illustrate the use of Streams.
17. Java Program that reads on file name from the user and displays the contents of file.
18. Write an applet that displays a simple message.
19. Write an applet that computes the payment of a loan based on the amount of the loan, the interest rate and the number of months. It takes one parameter from the browser: Monthly rate; if true, the interest rate is per month; Other wise the interest rate is annual.
20. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the + - X % operations. Add a text field to display the result.
21. Write a Java program for handling mouse events.
22. Write a Java program for creating multiple threads
23. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.
24. Write a Java program that lets users create Pie charts. Design your own user interface (with AWT)
25. Write a Java program that allows the user to draw lines, rectangles and ovals.
26. Write a Java program that illustrates how run time polymorphism is achieved.

TEXT BOOK

1. THE COMPLETE REFERENCE JAVA J2SE 5TH EDITION BY – HERBERT SCHILDT (TMH)

REFERENCE BOOKS

1. THE COMPLETE REFERENCE JAVA 2 (Fourth Edition) BY - PATRICK NAUGHTON & HERBET SCHILDT (TMH)
2. PROGRAMMING JAVA - DECKER&HIRSH FIELD VIKAS PUBLISKING (2001) (THOMSON LEARNING) (SECOND EDITON)
3. INTRODUCTION TO JAVA PROGRAMMING - Y.DANIEL LIANG PHI(2002)
4. OBJECT ORIENTED PROGRAMMING THROUGH JAVA 2 BY - THAMUS WU (Mc.Graw Hill)
5. JAVA 2 - DIETEL & DIETEL (PEARSON EDUCATION)
6. INTRODUCTION TO JAVA – BALA GURU SWAMY
7. INTRODUCTION TO PROGRAMMIND & OOD USING JAVA – JAINO NINE & FA HOSCH (JOHN WILEY)
8. STARTING OUT WITH JAVA – JONY GADDIS (DREAM TECH PRESS)

MCA128: OPERATING SYSTEM AND SYSTEM SOFTWARE – LAB

Workload: 4 PPW

Marks: University Exam – 50

a) Assembly programming exercises from Unit I of the text book of Unit I of theory paper must be practiced

b)

1. Simulate the following CPU Scheduling algorithms
 - a) Round Robin
 - b) SJF
 - c) FCFS
 - d) Priority
2. Simulate all file allocation strategies.
 - a) Sequential
 - b) Indexed
 - c) Linked
3. Simulate MVT and MFT
4. Simulate all File organization techniques.
 - a) Single level directory
 - b) Two level
 - c) Hierarchical
 - d) DAG
5. Simulate Bankers Algorithm for Dead Lock Avoidance
6. Simulate Bankers Algorithm Dead Lock Prevention.
7. Simulate all Page replacement algorithms.
 - a) FIFO
 - b) LRU
 - c) LFU
 - d) Etc....
8. Simulate Paging Techniques of memory management.

MCA211: DATABASE MANAGEMENT SYSTEMS

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT – I

FUNDAMENTALS OF DATABASE CONCEPTS: Database and Database Users: Characteristics of the Database Approach – Advantages of Using the DBMS Approach – A Brief History of Database Applications. Database System Concepts and Architecture: Data Models, Schemas, and Instances – Three Schema Architecture and Data Independence – Database Languages and Interfaces – The Database System Environment – Centralized and Client/Server Architectures for DBMSs – Classification of Database Management Systems. Data Modeling Using the Entity Relationship Model: Using High-Level Conceptual Data Models for Database Design – An Example Database Application – Entity Types, Entity Sets, Attributes, and Keys – Relationship Types, Relationship Sets, Roles, and Structural Constraints – Weak Entity Types – ER Diagrams, naming Conventions, and Design Issues.

(Chapters 1 to 3)

UNIT – II

FUNDEAMENTALS OF RELATIONAL MODEL: The Relational Data Model and Relational Database Constraints: Relational Model Concepts – Relational Model Constraints and Relational Database Schemas. The Relational Algebra and Relational Calculus: Unary Relational Operations: SELECT and PROJECT – Relational Algebra Operations from Set Theory – Binary Relational Operations: JOIN and DIVISION – Additional Relational Operation – The Tuple Relational Calculus – The Domain Relational Calculus. Relational Database Design Using ER to Relational Mapping.

(Chapters 5.1, 5.2, 6, 7.1)

UNIT – III

RELATIONAL DATABASE DESIGN: Functional Dependencies and Normalization for Relational Databases: Informal Design Guidelines for Relation Schemas – Functional Dependencies – Normal Forms Based on Primary Keys – General Definitions of Second and Third Normal Forms – Boyce-Codd Normal Form. Relational Database Design Algorithms and Further Dependencies: Properties of Relational Decompositions – Algorithms for Relational Database Schema Design – Join Dependencies and Fifth Normal Form.

(Chapters 10 and 11)

UNIT - IV

FUNCTIONS OF DBMS: Introduction to Transaction Processing Concepts and Theory: Introduction to Transaction Processing – Transaction and System Concepts – Desirable Properties of Transactions – characterizing Schedules Based on Recoverability – Characterizing schedules Based on Suialisability. Concurrency Control Techniques: Two-Phase Locking Techniques for Concurrency Control – Concurrency Control Based on Timestamp Ordering. Database Recovery Techniques: Recovery Concepts – Recovery Techniques Based on Deferred Update – Recovery Techniques Based on Immediate Update – Shadow paging.

(Chapters 17.1 to 17.5, 18.1, 18.2, 19.1 to 19.4)

TEXT BOOK

1. FUNDAMENTALS OF DATABASE SYSTEMS BY – RAMEZ ELMASRI SHAMKANT B. NAVATHE V EDITION (PEARSON)

REFERENCE BOOKS

- 1 DATABASE SYSTEM CONCEPTS (IV Edition) BY - SILBER SCHATZ, KORTH G. SUDARSHAN (TMH 2002)
- 2 <http://nptel.iitm.ac.in/video.php?subjectId=106106093>

- 3 DATABASE MANAGEMENT SYSTEMS BY - ALEXI'S LEON AND MATHEWS LEON (LION VIKAS -2002)
- 4 DATABASE MANAGEMENT SYSTEMS (II Edition) - GERALD. V. POST
- 5 MODERN DATABSE MANAGEMENT (IV Edition) BY - F.R.MC.FADDEN, J.A.HOFFER, M.B.PRESCOTT(Addison Wisley 2000)
- 6 DATABSE MANAGEMENT (III Edition) BY - PRATT and J.J. ADAMSKI (THOMSON EDUCATION-2002)
- 7 DATABASE APPLICATION DEVELOPMENT & DESIGN-MANINO(MCGRAW HIL)
- 8 DATABASE SYSTEMS CONNOLY, BEGG (PEARSON)
- 9 DATABASE SYSTEM IMPLEMENTATION – GARCIA, MOLNA, ULLMAN, WIDON (PHI)
- 10 A FIRST COURSE IN DATABASE SYSTEMS - ULLMAN, WINDON (PEARSON)
- 11 ROB. CORONEL, DATABASE SYSTEMS, THOMSON TECHNOLOGY.
- 12 DATABASE SYSTEMS CONNOLY, BEGG (PEARSON)
- 13 DATABASE SYSTEM IMPLEMENTATION – GARCIA, MOLINA, ULLMAN, WIDON (PHI)
- 14 <http://nptel.iitm.ac.in/syllabus/syllabus.php?subjectId=106104021>

MCA212: DATA COMMUNICATIONS AND NETWORKS

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT – I

BASIC CONCEPTS: Line Configuration – Point-to-Point, Multipoint – Topology – Mesh, Star, Tree, Bus, Ring, Hybrid topologies – Transmission Mode – simplex, Half-Duplex, Full-Duplex – Categories of Networks – LAN, MAN, WAN – Internetworks.

THE OSI LAYER: The Model – Layered structure – Functions of the Layers – Physical layer, Data Link layer, Network Layer, Transport Layer, Session Layer, Presentation Layer, Application Layer – TCP/IP Protocol suite

TRANSMISSION OF DIGITAL DATA: INTERFACES AND MODEMS: Digital Data Transmission – Parallel Transmission, Serial Transmission – DTE-DCE Interface – Data Terminal Equipment(DCE), Data Circuit-Terminating Equipment(DCE), Standards, EIA-232 Interface – Other interface standards – EIA-449, EIA-530, X.21 – MODEMS – Transmission Rate – Modem standards – 56K MODEMS – Traditional Modems, 56K Modems – Cable Modems –

MULTIPLEXING: Many to One Downloading, Uploading/ One to Many – Frequency-Division Multiplexing(FDM) – wave Division Multiplexing(WDM) – Time Division Multiplexing(TDM) – Inverse Multiplexing – Multiplexing Application – Common Carrier Services, Analog Services, Digital Services – Digital Subscriber Line(DSL) – ADSL, RADSL, HDSL, SDSL, VDSL – FTTC – FTTC in the Telephone Network, FTTC in the cable TV Network.

(Chapter 2, 3, 6 & 8)

UNIT-II

ERROR DETECTION AND CORRECTION: Types of Errors – Single-Bit Error, Burst Error – Detection – Redundancy – Vertical Redundancy check(VRC) – Longitudinal Redundancy Check(LRC) – Cyclic Redundancy Check(CRC) – Checksum – Error Correction – Single-Bit Error Correction, Hamming Code, Burst Error Correction.

DATA LINK CONTROL: Line Discipline – ENQ/ACK, Poll/Select – Flow Control – Stop-and-wait, Sliding Window – Error Control – Automatic Repeat Request (ARQ), Stop-and-wait ARQ, Sliding window ARQ.

LOCAL AREA NETWORK: Project 802 – IEEE 802.1, LLC 371, MAC 371, Protocol Data Unit(PDU) – Ethernet – Access Method:CSMA/CD, Addressing, Electrical Specification, Frame Format, Implementation – Other Ethernet Networks – Switched Ethernet, fast Ethernet, Gigabit Ethernet – Token Bus – Token Ring – Access Method:Token Passing, Addressing, Electrical Specification, Frame Format, Implementation – FDDI – Access Method:Token Passing, Addressing, Electrical Specification, Frame Format, Implementation:Physical Medium Dependent(PMD) Layer.

SWITCHING: Circuit Switching – Space-Division Switches, Time-Division Switches, TDM Bus, Space and time-division Switching Combinations, Public Switch Telephone Network(PSTN) – Packet Switching – Datagram Approach, Virtual Circuit Approach, Circuit-Switched Connection versus Virtual Circuit Connection – Message Switching.

(Chapter 9, 10, 12 and 14)

UNIT – III

INTEGRATED SERVICES DIGITAL NETWORK (ISDN): Services – Bearer Services, Tele services, Supplementary Services – History – Voice Communication over Analog Networks, Voice and data Communication over Analog Networks, Analog and Digital Services to Subscribers, Integrated Digital Network(IDN), Integrated Services Digital Network(ISDN) – subscriber Access to the ISDN – B Channels, D Channels, H Channels, User Interfaces, Functional Grouping, Reference Points – The ISDN Layers – Physical Layer, Data Link Layer, Network Layer – Broadband ISDN – services, Physical specifications – Future of ISDN.

X.25: X.25 Layers – Physical Layer, Frame Layer, Packet Layer, PLP Packets – Other Protocols related to X.25 – X.121 Protocol, triple-X Protocols.

NETWORKING AND INTERNETWORKING DEVICES: Repeaters – Not an Amplifier – Bridges – Types of Bridges, Bridges Connecting Different LANs – Routers – Routing concepts – Gateways – Other Devices – Multiprotocol Routers, Brouters, switches, Routing Switches – Routing algorithms – Distance

Vector Routing - Sharing Information, Routing Table - Link State Routing - Information Sharing, The Dijkstra Algorithm.

(Chapter 16, 17 and 21)

UNIT – IV

TRANSPORT LAYER: Duties of Transport Layer - End-to-End Delivery, Addressing, Reliable Delivery, Flow control, Multiplexing - Connection - Connection Establishment, connection Termination - The OSI Transport Protocol - Transport Classes, Transport Protocol Data Unit(TPDU), Connection-oriented and Connectionless services.

UPPER OSI LAYERS: Session layer - Session transport Interaction, Synchronization points, Session Protocol Data Unit - Presentation Layer - Translation, Encryption/decryption, Authentication, Data Compression - Application Layer - Message Handling System(MHS), File transfer, Access and Management(FTAM), Virtual Terminal(VT), Directory Services(DS), Common Management Information Protocol(CMIP).

TCP/IP PROTOCOL SUITE: Overview of TCP/IP - TCP/IP and the Internet, TCP/IP and OSI, Encapsulation - Network Layer - Internetwork Protocol(IP) - Addressing - classes, Dotted-decimal Notation, Nodes with More Than One Address, A Sample Internet - Subnetting - Three Levels of Hierarchy, Masking, Finding The Subnetwork Address - Other Protocols In the Network Layer - Address Resolution Protocol(ARP), Reverse Address Resolution Protocol(RARP),Internet Control Message Protocol(ICMP), Internet Group Message Protocol(IGMP) - Transport Layer - User datagram Protocol(UDP), Transmission Control Protocol(TCP).

(Chapter 22, 23 and 24)

TEXT BOOK

1. DATA COMMUNICATIONS AND NETWORKING BY BEHROUZ A. FOROUZAN (TATA Mc.Graw Hill)

REFERENCE BOOKS

2. BUSINESS DATA COMMUNICATION & NETWORKS By - FITZ GERALD (John Wiley)
3. DATA & COMPUTER COMMUNICATIONS - W STALLINGS (PEARSON, PHI)
4. COMPUTER COMMUNICATIONS & NETWORKING TOPOLOGIES - MA GALLO, V.M. HANCOCK (THOMSON)
5. DATA COMMUNICATION & COMPUTER NETWORKS - R. AGARWAL, BB TIWARI (VIKAS)
6. COMPUTER NETWORKS - AS TANENBAUM (PHI)
7. COMPUTER NETWORKS - BLACK (PHI)
8. UNDER STANDING COMMUNICATIONS & NETWORKS - WA SHAY (THOMSON)
9. COMPUTER NETWORKING A TOP-DOWN APPROACH FEATURING THE INTERNET BY - JAMES F. KUROSE AND KEITH W. ROSS (PEARSON)
10. http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Computer%20networks/New_index1.html
11. <http://nptel.iitm.ac.in/video.php?subjectId=106105081>

MCA213: SOFTWARE ENGINEERING - I

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT - I

INTRODUCTION TO SOFTWARE ENGINEERING: The Evolving Role of Software – Software – The Changing Nature of Software – Software myths.

A GENERIC VIEW OF PROCESS: Software Engineering-A Layered technology – A Process frame work – The capability Maturity Model Integration (CMMI) – Process Patterns – Process Assessment – Personal and Team Process Models – process Technology – Product and Process.

PROCESS MODELS: Prescriptive Models – The waterfall Model – Incremental Process Models – Evolutionary Process Models – Specialized Process Models – The Unified Process.
(Chapters 1, 2 and 3)

UNIT - II

AN ANGLE VIEW OF PROCESS: What is Agility? – What is an Agile Process? – Agile Process Models.

SOFTWARE ENGINEERING PRACTICE: Software engineering Practice – Communication Practice – Planning Practices – Modeling Practices – Construction Practice – deployment.

SYSTEM ENGINEERING: Compute-Based systems – The System Engineering Hierarchy – Business Process Engineering: An Overview – Product Engineering: An Overview – System Modeling.
(Chapters 4, 5 and 6)

UNIT - III

REQUIREMENT ENGINEERING: A Bridge to Design and Construction – Requirements Engineering Tasks – Initiating the Requirements Engineering Process – Eliciting Requirements – Developing Use – Cases – Building the analysis Model – Negotiating Requirements – Validating Requirements.

BUILDING THE ANALYSIS MODEL: Requirements Analysis – Analysis Modeling Approaches – Data Modeling Concepts – Object-oriented Analysis – Scenario-Based Modeling – Flow-Oriented Modeling – Class-Based Modeling – Creating a Behavioral Model.

DESIGN ENGINEERING: Design within the Context of Software Engineering – design Process and Design Quality – Design Concepts – The Design Model – Pattern-Based Software Design.
(Chapter 7, 8 and 9)

UNIT - IV

CREATING AN ARCHITECTURAL DESIGN: Software Architecture – Data Design – Architectural Styles and Patterns – Architectural Design – Assessing Alternative Architectural Designs – Mapping Data Flow into Software Architecture.

MODELING COMPONENT-LEVEL DESIGN: What is a Component? – Designing Class-Based Component-Level Design – Object Constraint Language – designing Conventional Components.

PERFORMING USER INTERFACE DESIGN: The Golden Rules – User Interface Analysis and Design – Interface Analysis – Interface Design Steps – Design Evaluation.
(Chapter 10, 11 and 12)

TEXT BOOK

1. SOFTWARE ENGINEERING BY R.S. PRESSMAN (Mc. Graw Hill Sixth Edition)

REFERENCE BOOKS

1. SOFTWARE ENGINEERING BY GHEZZI (PHI)
2. SOFTWARE ENGINEERING FUNDAMENTALS BY BEHFOROZ AND HUDSON OXFORD UNIVERSITY PRESS
3. SOFTWARE ENGINEERING BY FAIRLEY (Mc.Graw Hill)
4. SOFTWARE ENGINEERING Theory & practice by Pfleeger (Pearson)
5. SOFTWARE ENGINEERING by KR Agarwal & Yogesh Singh (New Age)

MCA214: PRINCIPLES AND PRACTICES OF MANAGEMENT

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT - I

Management: Meaning - Nature - Significance of Management Principles of Management - Approaches to Management - An Overview DOF Managerial Functions - Management as Profession - Social Responsibilities of Management.

PLANNING: Concept, Characteristics - Importance and Limitations Steps in Planning Process - Strategic Planning - Decision Making Process.

UNIT - II

ORGANISING: Concept - Importance - Steps in Organizing Process Base and Problems of Departmentation - Delegation of Authority - Centralization and Decentralization - Line and Staff Relations - Span of Management.

UNIT - III

DIRECTING: Nature and Importance - Communication - Concept Elements - Process - Patterns of Communication - Barriers to Communication.

MOTIVATION: Nature and Significance - Types of Motivation - Determinants of Motivation - A Brief Discussion on Theories of Motivation (MASLOW's Theory, McCLELLAND FNEED THEORY, THEORY X AND THEORY Y).

LEADERSHIP: Concept - Importance - Leadership Styles - Autocratic, Democratic and Free Rein.

UNIT - IV

STAFFING: Concept - Human Resource Planning - A Brief Description of Recruitment - Selection - Training and Appraisal Methods

Controlling: Meaning - Importance - Steps in Control Process - Problems of Controlling - A Brief Description of Control Techniques

Coordination : Need for Coordination - Approaches to Effective Coordination - Techniques of Coordination.

TEXT BOOK

1. L.M. PRASAD - PRINCIPLES AND PRACTICES OF MANAGEMENT.

REFERENCES

1. MANAGEMENT, JAMES A.F. STONER AND CHARLES WANKEL
2. MANAGEMENT, KOONTZ HAROLD AND O'DONNELL CYRIL
3. ORGANISATION AND MANAGEMENT, LOUIS ALLEN
4. MANAGEMENT - TASKS AND RESPONSIBILITIES, PETER F DRUCKER

MCA215: .NET PROGRAMMING

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT - I

Fundamentals of Visual Basic, Exception handling, windows forms, Control Classes, Different Types of Boxes, Labels, Buttons, Panels.

(Chapters 1 to 7)

UNIT - II

WINDOWS FORMS: Different types of Bars, Menus, and Views.

OBJECT - ORIENTED PROGRAMMING: Classes and objects constructors and destructors, inheritance, modifiers, Interfaces, Polymorphism, late Binding, Graphics handling and File handling.

(Chapters 8 to 13)

UNIT - III

WEB FORMS: Working with web forms, Web forms and HTML, The Web control class, Web Forms and Boxes, Web Forms and Buttons, Validation Controls, Ad Rotators, Web Forms and HTML controls.

(Chapters 14 to 19)

UNIT - IV

DATA ACCESS WITH ADO.NET : Accessing data with the server explorer, Data adapters and Data sets, Binding Controls to databases, Handling databases in code, Database access in Web Applications. Creating user Controls, Web user Controls, and Multithreading creating Windows services, Web Services and Deploying applications.

(Chapters 20 to 25)

TEXT BOOK

1. VB.NET PROGRAMMING (BLACK BOOK) BY STEVEN HOLZNER (Dreamtech- 2003)

REFERENCE BOOKS

1. VB.NET PROGRAMMING BY T. GADDIS (Dreamtech)
2. Microsoft Visual Basic. Net step by step By Halverson (PHI)
3. OOP with Microsoft Visual Basic.Net By Reynolds Hacrtte (PHI)

MCA216: DBMS - LAB

Workload: 4 PPW

Marks: University Exam – 50

Introduction to SQL, DDL, DML, Statements, Built in functions, Aggregate Functions, Joins, Unions, Ordinary Queries, Sub queries, Co-related Sub Query, Nested Sub-queries, Parallel & Sub queries.

i) PL/SQL: Data Types, Control structures, Cursor handling Mechanism, Sub programs Procedures & Functions, Stored Procedures, Database triggers & exception handling.

SUGGESTED BOOK

STARTING OUT WITH ORACLE – JOHN DAY, CV SLYKE (DREAM TECH)

ADDITIONAL BOOKS

1. ORACLE DEVELOPER 2000 – IVAN BAYROSS (BPB)
2. SQL, PL/SQL – PS DESHPANDE (DREAM TECH)
3. ORACLE DATABASE 10G SQL – J PRICE (TMH)
4. DATABASE SYSTEMS USING ORACLE – N SHAH (PHI)
5. ORACLE FORMS DEVELOPERS HANDBOOK – LULUSHI (PEARSON)
6. ORACLE SQL AND PL/SQL HANDBOOK – JA PALINSKI (PEARSON)

MCA217: Software Testing - Lab

Workload: 4 PPW

Marks: University Exam – 50

1. Perform GUI Regression test using Rapid Test Script Wizard (RTSW).
2. Perform Bit map Regression test using RTSW.
3. Perform User Interface test using RTSW.
4. Perform Test template test using RTSW.
5. Perform GUI checkpoint for single property.
6. Perform checkpoint for single property.
7. Perform GUI checkpoint for multiple objects.
8. Perform Bitmap checkpoint for object/window.
9. Perform Bitmap checkpoint for screen area.

By Using the Sample Visual Basic Application

1. Perform GUI Regression test using Rapid Test Script Wizard for Visual Basic Application
2. Perform Bit map Regression test using RTSW for Visual Basic
3. Perform User Interface test using RTSW for Visual Basic application.
4. Perform Test template test using RTSW for Visual Basic application.
5. Perform GUI checkpoint for single property for Visual Basic Application.
6. Perform checkpoint for single property (use VB Application)
7. Perform GUI checkpoint for multiple objects for Visual Basic Application.
8. Perform Bitmap checkpoint for object/window for Visual Basic Application.
9. Perform Bitmap checkpoint for screen area for VB Application.

Test Cases Preparation

1. Prepare a Test case to evaluate the process of changing the password of a user (Use Visual Basic Application).
2. Prepare a Test Case to evaluate the Calculator Operations. (Develop an Visual Basic Application).

REFERECE BOOKS

1. SOFTWARE TESTING TOOLS BY KVKK PRSAD (Dream tech)
2. Software testing tools by Nageshwar rao pusuluri (Dream Tech)

MCA218 VISUAL PROGRAMMING LAB

Workload: 4 PPW

Marks: University Exam – 50

The concepts covered in the corresponding theory paper are to be implemented.

TEXT BOOK

1. VB.NET PROGRAMMING (BLACK BOOK) BY STEVEN HOLZNER (Dreamtech- 2003)

REFERENCE BOOKS

2. VB.NET PROGRAMMING By T. GADDIS (Dreamtech)
3. Microsoft Visual Basic. Net step by step By Halverson (PHI)
4. OOP with Microsoft Visual Basic.Net By Reynold Hacrte (PHI)

MCA221: DATA MINING

Workload: 4 PPW Marks: University Exam – 80: Internal Exam - 20

UNIT-I

Introduction

What is Data Mining? , Data Mining on what kind of data?, Data Mining Functionalities, Are all of the Patterns Interesting?, classification of data mining systems, Data Mining Task primitives, Integration of a Data Mining System with a Database or data warehouse system , Major issues in Data Mining,

Data Preprocessing

Why preprocess the data, Descriptive Data summarization, Data Cleaning, Data Integration and transformation, Data reduction, Data Discrimination and concept Hierarchy Generation
(Chapters 1 & 2)

UNIT-II

Data Warehouse and OLAP Technology

What is Data Warehouse, A Multidimensional Data Model, Data Warehouse Architecture, data Warehouse Implementation, from Data Warehouse to data mining.

Data Cube Computation and data Generalization

Efficient Methods for Data Cube Computation, Further Development of Data Cube and OLAP Technology, Attribute-oriented Induction-An alternative method for Data Generalization and concept Description.

(Chapters 3 & 4)

UNIT-III

Mining Frequent Patterns, Associations and Correlations

Basic concepts and a road Map, Efficient and scalable Frequent Itemset Mining methods, Mining various kinds of Association Rules, from Association Mining to Correlation analysis, constraint-Based Association mining.

Classification and Prediction

What is classification and Prediction, issues regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Back propagation, support Vector Machines, Associative Classification, Lazy Learners, Other Classification methods, Prediction, accuracy and error measures, evaluating the accuracy of a classifier or predictor, Ensemble methods, Model selection.

(Chapters 5 & 6)

UNIT – IV

Cluster analysis

What is Cluster analysis, types of data in cluster analysis, a categorization of major clustering methods, Partitioning methods, Hierarchical methods, Density Based methods, Grid Based methods, Model-Based Clustering methods, clustering high-dimensional data, constraint-based cluster analysis, Outlier analysis.

(Chapter 7)

TEXT BOOK

1. DATA MINING CONCEPTS & TECHNIQUES BY JIAEEI HAN, MICHELINE & KAMBER (2nd EDITION)
(Elsevier Publishing Company)

REFERENCE BOOKS

1. Data Mining Introductory and advanced topics –MARGARET H DUNHAM, PEARSON EDUCATION
2. Data Mining Techniques – ARUN K PUJARI, University Press.
3. Data Warehousing in the Real World – SAM ANAHORY & DENNIS MURRAY. Pearson Edn Asia.
4. Data Warehousing Fundamentals – PAULRAJ PONNAIAH WILEY STUDENT EDITION
5. The Data Warehouse Life cycle Tool kit – RALPH KIMBALL WILEY STUDENT EDITION
6. DATA WAREHOUSING, DATA MINING & OLAP BY ALEX BERSON AND STEPHEN J. SMITH (TMH)
7. Data Warehousing by S Mohanthy (TMH)
8. Data Warehousing using Oracle by Deshpande (Dreamtech)
9. Data Warehousing by Amitesh Sinha (Thomson)
10. Data Mining by P Adriaans & D Zantinge (Pearson)
11. Data Mining by S M Sivanandam & S Sumathi
12. <http://www.cs.sfu.ca/~han/dmbook>
13. <http://www.cs.sfu.ca/~han/han.html>

MCA222: UNIX NETWORK PROGRAMMING

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT - I

Interprocess Communication: Introduction, File and Record Locking, Simple Client-server Pipes, FIFO's, Streams and Messages, Name Spaces, System V IPC, Message Queues, Semaphores, Shared Memory, Socket and TLI.

(Chapters 3, 3.1 to 3.12)

UNIT - II

A Network Primer Communication Protocols: Introduction, TCP/IP, XNS, SNA, NetBIOS, OSI Protocol, UUCP, Protocols Comparisons.

(Chapters 4, 5, 5.1 to 5.8)

UNIT - III

Berkeley Sockets: Introduction, Overview, Unix Domain Protocols, Socket Addresses, Elementary Socket System Calls, Simple Examples, Advanced Socket System Calls, Reserved Ports, Stream Pipes, Passing File Descriptors, Socket Options, Asynchronous I/O, Input/Output Multiplexing, Out-of-Band and Data, Sockets and Signals, Internet Super server, Socket Implementation.

(Chapters 6, 6.1 to 6.17)

UNIT - IV

Transport, Overview, Transport Endpoint Addresses, Elementary TLI Functions, Simple Example, Advanced TLI Functions, Streams, TLI Implementation, Stream Pipes, Passing File Descriptors, Input/Output Multiplexing, Asynchronous I/O, Out-of-Band Data.

(Chapters 7, 7.1 to 7.13)

TEXT BOOK

1. UNIX NETWORK PROGRAMMING BY W. RICHARD STEVENS

REFERENCE BOOKS

1. UNIX SYSTEMS PROGRAMMING – K.A. ROBBINS, S. ROBBINS (PEARSON)
2. UNIX THE C ODYSSEY – M. GANDHI, SHETTI, SHAH (BPB PUBLICATIONS)
3. Unix made easy by J Muster (TMH)
4. Advanced Unix Programming by MJ Rochkind (Pearson)

MCA223: ADVANCED JAVA

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT - I

FILES AND STREAMS: Introduction, Data Hierarchy, Files and Streams, Creating a Sequential-Access File, Random-Access Files, Reading Data Sequentially from a Random-Access File.

NETWORKING: Introduction, Manipulating URLs, Reading a File on a Web Server, Establishing a Simple Server, Establishing a Simple Client, Client/Server Interaction with Stream Socket Connections, Connectionless Client/Server Interaction with Datagrams, Client/Server Tic-Tac-Toe Using a Multithreaded Server, Security and the Network.

(Chapter 17 and 21 of Book 1)

UNIT - II

JDBC DATABASE ACCESS: JDBC Basics, New Features in the JDBC 2.0 API

(Chapter 26 and 27 of Book 2)

UNIT - III

REMOTE METHOD INVOCATION (RMI): Introduction, Case Study: Creating a Distributed System with RMI, Defining the Remote Interface Implementing the Remote Interface, Define the Client, Compile and Execute the Server and the Client.

JAVA BEANS: Introduction, Bean Box Overview, Preparing a Class to Be a JavaBeans, Creating a JavaBeans: Java Archive Files and the jar Utility, Adding Beans to the Bean Box, Connecting Beans with Events in the Bean Box, Adding Properties to a JavaBeans, Creating a JavaBeans with a Bound Property, Specifying the Bean Info Class for a JavaBeans, JavaBeans World Wide Web Resources.

(Chapters 20 and 25 of Book 1)

UNIT - IV

SERVLETS: Overview of Serves, Interacting with Clients, The Life Cycle of a Servlet, Saving Client State, The servlet runner Utility, Running Servlets.

(Chapters 34 to 39 of Book 2)

TEXT BOOKS

1. JAVA HOW TO PROGRAM Third Edition - Deitel & Deitel
2. THE JAVA TUTORIAL CONTINUED Compione, Walrath, Huml, Tutorial Team - Addison Wesley

REFERENCE BOOKS

1. JAVA TUTORIAL CONTINUED – CAMPIONE (Addison Wesley)
2. THE COMPLETE REFERENCE JAVA 2 (Fourth Edition) BY - PATRICK NAUGHTON & HERBET SCHILDT (TMH)
3. PROGRAMMING JAVA - DECKER&HIRSH FIELD VIKAS PUBLISKING (2001) (THOMSON LEARNING) (SECOND EDITON)
4. INTRODUCTION TO JAVA PROGRAMMING - Y.DANIEL LIANG PHI(2002)
5. OBJECT ORIENTED PROGRAMMING THROUGH JAVA 2 BY - THAMUS WU (Mc.Graw Hill)
6. JAVA 2 - DIETEL & DIETEL (PEARSON EDUCATION)
7. INTRODUCTION TO JAVA – BALA GURU SWAMY
8. INTRODUCTION TO PROGRAMMIND & OOD USING JAVA JAINO NINE & FA HOSCH (JOHN WILEY)
9. STARTING OUT WITH JAVA – JONY GADDIS (DREAM TECH PRESS)
10. JAVA PROGRAMMING – SCHAUM’S SERIES
11. OBJECT ORIENTED APPLICATION DEVELOPMENT USING JAVA – ER DOXE ETC. (THOMSON PRESS)
12. THINKING IN JAVA –BY – BRUCE ECKEL (PEARSON)

MCA224: SOFTWARE ENGINEERING - II

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT - I

TESTING STRATEGIES: A strategic approach to software testing – Verification and Validation – Organizing for Software Testing – Testing Strategies – Criteria for completion of testing – unit, Integration, validation and system testing – debugging.

TESTING TACTICS: Testing Fundamental – White Box, Black Box, and Control Structure Testing – Object Oriented testing Methods.

PRODUCT METRICS: Software Quality – McCall's Quality Factors – ISO 9126 Quality Factors – Measures, Metrics and Indicators – Measures for analysis, design, code and testing – metrics for Maintenance.

(Chapters 13, 14 & 15)

UNIT - II

PROJECT MANAGEMENT: The management Spectrum – The People – The Product – The Process – The Project – The W⁵HH Principle – Critical Practices.

MERTICS FOR PROCESS AND PROJECTS: Metrics in the Process and Project Domains – Software Measurement – Metrics for Software Quality – Integrating Metrics within the Software Process – Metrics for Small Organizations – Establishing a Software Metrics Program.

ESTIMATION: Observations on Estimation – The Project Planning Process – Software Scope and Feasibility – Resources – Software Project Estimation – Decomposition Techniques – Empirical Estimation Models – Estimation for Object-Oriented Projects – Specialized Estimation Techniques – The Make/buy Decision.

(Chapters 21, 22 and 23)

UNIT - III

PROJECT SCHEDULING: Basic Concepts – Project Scheduling – Defining a Task Set for the Software Project – Defining a Task Network – Scheduling – Earned Value Analysis.

RISK MANAGEMENT: Reactive vs. Proactive Risk Strategies – Software Risks – Risk Identification – risk Projection – Risk Refinement – Risk Mitigation, Monitoring, and Management – The RMMM Plan.

QUALITY MANAGEMENT: Quality Concepts – Software Quality Assurance – Software Reviews – Formal Technical Reviews – Formal Approaches To SQA – Statistical Software Quality Assurance – Software Reliability – The ISO 9000 Quality Standards – The SQA Plan.

(Chapters 24, 25 and 26)

UNIT - IV

CHANGE MANAGEMENT: Software Configuration Management – The SCM Repository – The SCM Process – Configuration Management for Web Engineering.

FORMAL METHODS: Basic Concepts – Mathematical Preliminaries – applying Mathematical Notation for Formal Specification – Formal Specification Languages – Object Constraint Language (OCL) – The Z Specification Language – The Ten Commandments o Formal Methods – Formal Methods – The Road Ahead.

CLEANROOM SOFTWARE ENGINEEING: The Clean room Approach – Functional Specification – Clean room Design – Clean room Testing.

REENGINEERING: Business Process Reengineering – Software Reengineering – Reverse Engineering – Restructuring – forward Engineering – The Economics of Reengineering.

(Chapters 27, 28, 29 and 31)

TEXT BOOK

1. SOFTWARE ENGINEERING BY R.S. PRESSMAN (McGraw Hill Sixth Edition)

REFERENCE BOOKS

2. SOFTWARE ENGINEERING BY GHAZZI (PHI)
3. SOFTWARE ENGINEERING BY FAIRLEY (McGraw Hill)
4. SOFTWARE ENGINEERING by Behforouz and Hudson Oxford University Press)
5. SOFTWARE ENGINEERING Theory & practice by Pfleeger (Pearson)
6. SOFTWARE ENGINEERING by KR Agarwal & Yogesh Singh (New Age)
7. SOFTWARE ENGINEERING. (Schaum's Series TMH)
8. Object Oriented SOFTWARE ENGINEERING by SR Schach (TMH)
9. Object Oriented System Analysis And Design by Bennett etl (TMH)
10. http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Soft%20Engg/New_index1.html
11. http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Soft%20Engg/New_index1.html

MCA225: ACCOUNTING AND FINANCIAL MANAGEMENT

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT – I

Accounting Information System – Users of accounting information, Accounting concepts & conventions, Double entry system – Journal, Journalising.

Ledger Posting – Balancing, Subsidiary books – purchase, Sales, P/R, S/R, Cash Book, cash book Triple column. – Problems, Bank Reconciliation statement. – problems. Trial Balance – Preparation of T/B problems.

UNIT - II

Financial Statements – Utility to users, Trading A/C, Profit & Loss A/C – Classification of Expenses. Classification of Assets and Liabilities, Balance Sheet – Problems – Adjustments: closing stock, outstanding expenses and incomes, prepaid expenses and incomes received in advance, Depreciation, Bad debts, provision for Doubtful debts; interest on capital and Drawings, Problems pertaining to sole Traders, Financial Statements of Non- Profit organization, Receipts & payments A/C, Income and Expenditure A/C and Balance Sheet – simple problems without adjustments.

UNIT - III

Financial Management – Meaning – Need - Profit maximization VS wealth maximization.

Financial Decisions making - Financing Decisions – Sources of Finance: Equity, Debt – Cost of various sources of financing – concept of capital structure. (simple description), Investment Decisions – Characteristics, dividend decisions – concept – Retained earnings.

Financial Analysis – Meaning – indicators of financial status – profitability liquidity, solvency, turnover, Leverage, Types of Financial Analysis – Horizontal Analysis – comparative statements, Vertical Analysis – Common Size statement.

Ratio analysis – meaning – Standards of Comparison.

Profitability Ratios – G.P. Ratio, N.P. Ratio, ROI, EPS, P/E Ratio, Liquidity Ratios – current Ratio, Quick Ratio, Solvency Ratios – Debt equity, Debt – Total funds Turnover Ratios – Stock Turnover, Debtors Turnover, Stock velocity, Debt collection period, Fixed assets turnover, working capital turnover, Simple problems on Ratio analysis.

UNIT - IV

Cost Accounting – Meaning – Significance of cost information Costs – Meaning - Classification : Functional Classification Behavior of costs – Fixed, variable – Features Simple description of costing methods, Preparation Cost sheet under unit costing using functional classification of Costs Cost information for decision making - Decision areas, Marginal Costing – Meaning – Marginal cost Statement, Break even Analysis – Graphic, mathematical Approach, Contribution Margin, P/V Ratio, BEP, Profit Planning, Sales Planning, Sample Problems of Marginal costing, key factor – Simple problems using key factor.

SUGGESTED REFERENCE BOOKS

1. Gupta, R.L. and Radha Swamy, M., Accountancy, Sultan Chand & Sons, New Delhi
2. Mukarjee A and Hanif M, Modern Accountancy, Tata Mc Graw Hill, New Delhi
3. Tulsin P.C, Financial Accounting, TMH, New Delhi
4. Maheswar SN and Maheswari S.K., Financial Accounting, Vikas Publishing House, Mumbai
5. Pandey I.M., Financial Management, Vikas Publishing House, Mumbai.
6. Khan M. Y and Jain P.K., Financial Management, TMH, New Delhi
7. Maheshwari S.N, Cost and Management Accounting, Vikas Publishing House, Mumbai
8. Jain P.K. and Naraang K.L., Cost Accounting, kalyani Publishers, Mumbai
9. Catherine Gowthrope, Business Accounting and Finance: For Non specialists (2nd Ed.) International Thomson Business press, Singapore.

MCA226: UNIX NETWORK PROGRAMMING LAB

Workload: 4 PPW

Marks: University Exam – 50

1. Write a program that takes one or more file/directory names as command line
2. input and reports the following information on the file:
 - a. File type.
 - b. Number of links.
 - c. Time of last access.
 - d. Read, Write and Execute permissions.
3. Write a C program that illustrates how to execute two commands concurrently with a command pipe.
4. Write a C program that illustrates the creation of child process using fork system call.
5. Write a C program that displays the real time of a day every 60 seconds.
6. Write a C program that illustrates file locking using semaphores.
7. Write a C program that implements a producer-consumer system with two processes.(using semaphores)
8. Write a C program that illustrates inter process communication using shared memory system calls.
9. Write a C program that illustrates the following.
 - a. Creating a message queue.
 - b. Writing to a message queue.
 - c. Reading from a message queue.

TEXT BOOK

1. UNIX NETWORK PROGRAMMING BY W. RICHARD STEVENS

REFERENCE BOOKS

1. UNIX SYSTEMS PROGRAMMING – K.A. ROBBINS, S. ROBBINS (PEARSON)
2. UNIX THE C ODYSSEY – M. GANDHI, SHETTI, SHAH (BPB PUBLICATIONS)

KUMCA-227: MINI PROJECT

Workload: 4 PPW

Marks: University Exam – 50

Using Database Server and front end Tools

MCA228: ADVANCED JAVA - LAB

Workload: 4 PPW

Marks: University Exam – 50

PROGRAMS IN JDBC:

1. Write a JDBC Application which creates following menu.
 1. Select statement
 2. Statement other than select statement
 3. ExitEnter your choice (1..3):
Answer:
2. Write a JDBC Application which inserting the data at runtime.
3. Write a JDBC Application to select values from table using prepared statement
4. Write a JDBC Application with designing the form

- Query**
5. Write a JDBC Application. Finding out column count and column labels along with data
 6. Write a JDBC Application finding out all the tables in the database.
 7. Write a JDBC Application reading dates and null values from the database.
 1. Write a JDBC Application with form designing

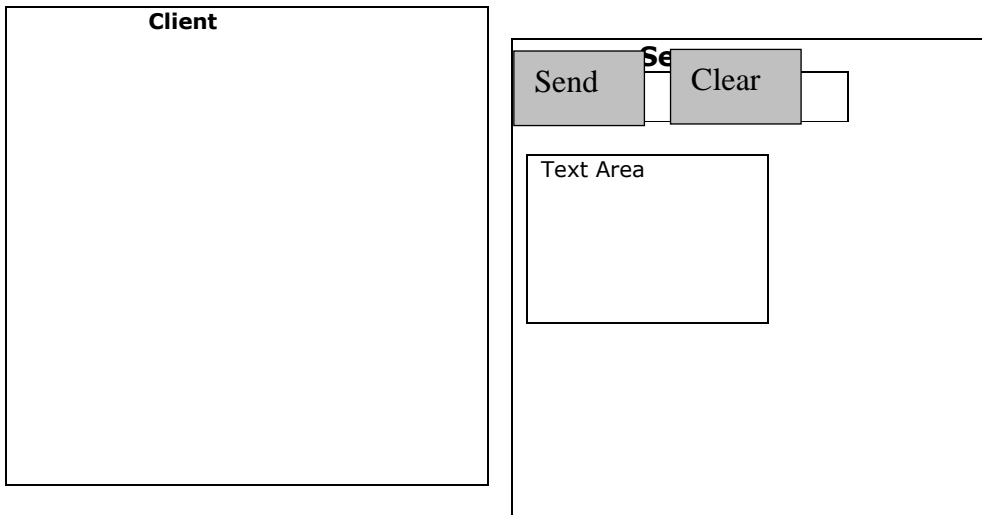
The image shows a Java Swing window with a menu bar and a text area. The menu bar contains five buttons: 'Insert', 'First', 'Delete', 'Select', and 'Exit'. Below the menu bar, the text area contains the following labels: 'Emp no', 'Emp Name', 'Salary:', and 'Designation'. The window has a standard Mac OS-style title bar with a close button on the right.

9. Write a JDBC Application for SQL procedure Execution with both IN and OUT parameter using callable statement.
10. Write a JDBC Application for SQL function Execution using callable statement.

NETWORKING:

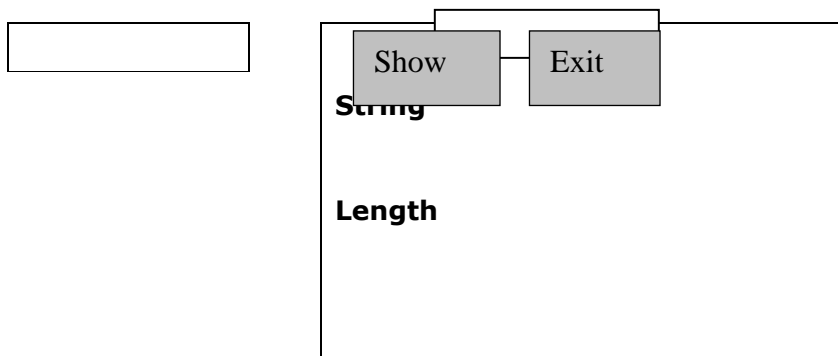
1. Write a client/server application using stream sockets

2. Write a client/server application using datagram sockets
3. Write a program for simple file transfer.
4. Write a program for reading from a URL
5. Write a program for Multithreaded FTP server
6. Write a client/server program with form designing (Text field, labels, Text Area, Buttons)



RMI:

1. Write a program for on RMI Application
2. Write a program for passing on objects to on RMI
3. Write an RMI Application for invoking the database to retrieve the results
4. Write an RMI Application with Form Designing



5. Write an RMI Application with form designing
Enter file name by selecting the file dialog box

Show

Clear

Exit

Text Area

JAVA – BEANS:

1. Write a Bean Application for an simple property
2. Write a Bean Application for an Boolean Property
3. Write a Bean Application to retrieve the values from the table by invoking database
4. Write a Bean Application for an Indexed property
5. Write a Bean Application for starting and stopping the Juggler Bean and Execute it in Applet
6. Write a Bean Application for an Bound property
7. Write a Bean Application for an constrained property
8. Write a Bean Application for Rotating a Molecular Bean

SERVLETS:

1. Write servlet program for displaying a message in a browser using generic servlet
2. Write a servlet program to communicate html-servlet

Name:

Age:

Send

3. Write a servlet program to retrieve the initial arguments
4. Write a servlet program to communicate the Html – Servlet – Database. Retrieve the results for a particular Empno.

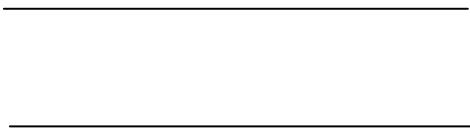
Emp no

Send

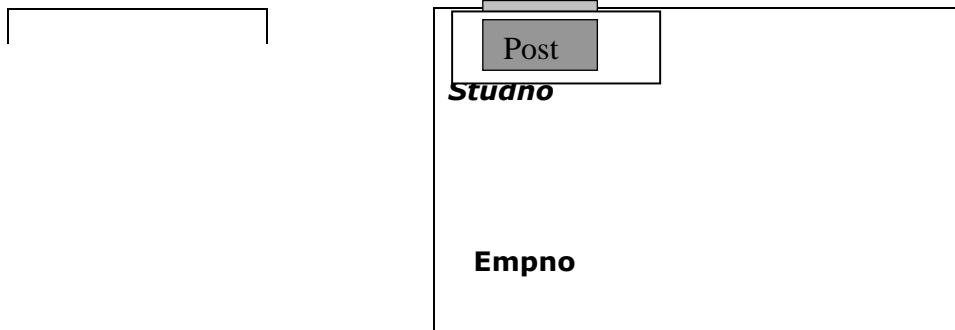
5. Write a servlet program to retrieve the results form a table in the format

Empno	Emp Name	Sal
101	xyz	1500
102	abc	3000

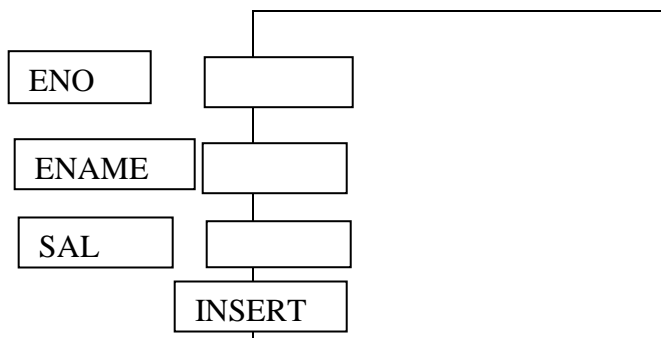
44



6. Write a servlet program for communicating first servlet to second servlet
7. Write a servlet program for invoking the get and post methods.



8. Write a servlet program for session tracking using hidden form fields.
9. Write a servlet program for session tracking using http session.
10. Write a servlet program for session tracking using cookies
11. write a servlet program for communicating first servlet to another by URL class
12. Write a servlet program in the format using http servlet.



TEXT BOOK

1. JAVA How to Programming BY DEITEL & DEITEL (PEARSON Education - Third Edition-2001)

REFERENCE BOOKS

2. JAVA TUTORIAL CONTINUED – CAMPIONE (Addison Wesley)
3. THE COMPLETE REFERENCE JAVA 2 (Fourth Edition) BY - PATRICK NAUGHTON & HERBET SCHILDT (TMH)
4. PROGRAMMING JAVA - DECKER&HIRSH FIELD VIKAS PUBLISKING (2001) (THOMSON LEARNING) (SECOND EDITON)
5. INTRODUCTION TO JAVA PROGRAMMING - Y.DANIEL LIANG PHI(2002)
6. OBJECT ORIENTED PROGRAMMING THROUGH JAVA 2 BY - THAMUS WU (Mc.Graw Hill)
7. JAVA 2 - DIETEL & DIETEL (PEARSON EDUCATION)
8. INTRODUCTION TO JAVA – BALA GURU SWAMY
9. INTRODUCTION TO PROGRAMMIND & OOD USING JAVA – JAINO NINE & FA HOSCH (JOHN WILEY)
10. STARTING OUT WITH JAVA – JONY GADDIS (DREAM TECH PRESS)
11. JAVA PROGRAMMING – SCHAUM’S SERIES

MCA311: ARTIFICIAL INTELLIGENCE

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT – I

ARTIFICIAL INTELLIGENCE: ITS ROOTS AND SCOPE, AI: HISTORY AND APPLICATIONS: From Eden to ENIAC: Attitudes toward Intelligence, Knowledge, and Human Artifice, Overview of AI Application Areas

ARTIFICIAL INTELLIGENCE AS REPRESENTATION AND SEARCH: Introduction, The Propositional Calculus, The Predicate Calculus, Using co Rules to Produce Predicate Calculus Expressions, Application: A Logic-Based Financial Advisor. (Chapters 1 & 2)

UNIT – II

STRUCTURES AND STRATEGIES FOR STATE SPACE SEARCH: Introduction, Graph Theory, Strategies for State Space Search, Using the State Space to Represent Reasoning with the Predicate Calculus.

HEURISTIC SEARCH: Introduction, An Algorithm for Heuristic Search, Admissibility, Monotonicity, and Informed ness, Using Heuristics in Games, Complexity Issues.

CONTROL AND IMPLEMENTATION OF STATE SPACE SEARCH: Introduction, Recursion-Based Search, Pattern-Directed Search, production Systems, The Blackboard Architecture for Problem Solving. (Chapters 3, 4 and 5)

UNIT – III

REPRESENTATION AND INTELLIGENCE: THE AI CHALLENGE: KNOWLEDGE REPRESENTATION: Issues in Knowledge Representation, A Brief History of AI Representational Systems, Conceptual Graphs: A Network Language, Alternatives to Explicit Representation, Agent Based and Distributed Problem Solving.

STRONG METHOD PROBLEM SOLVING: Introduction, Overview of Expert System Technology, Rule-Based Expert Systems, Model-Based, Case Based, and Hybrid Systems, Planning. (Chapters 6 and 7)

UNIT – IV

REASONING IN UNCERTAIN SITUATIONS: Introduction, Logic-Based Adductive Inference, Abduction: Alternatives to Logic, the Stochastic Approach to Uncertainty.(Chapter 8)

TEXT BOOK

1. ARTIFICIAL INTELLIGENCE by George F Luger, Pearson Education.

REFERENCE BOOKS:

2. ARTIFICIAL INTELLIGENCES by Ritch & Knight.
3. INTRODUCTION TO ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS By D.W. Patterson (PHI-2001)
4. ARTIFICIAL INTELLIGENCE By Patrick Henry Winston(Pearson)
5. PRINCIPLES OF ARTIFICIAL INTELLIGENCE (Narosa)
6. Artificial Intelligence By Shiart Russel Peter Norvig (Pearson)
7. EXPERT SYSTEMS SYSTEMS AND PRACTICE By Giarratano & Riely (Thomson)
8. ARTIFICIAL INTELLIGENCE APPLICATIONS PROGRAMMING By M Tim Jones (Dreamtech)
9. DECISION SUPPORT SYSTEMS AND INTELLIGENT SYSTEMS By E Turban & J E Aronson (Pearson)
10. Artificial intelligence By E Charnaik and D Mcdermott (Addission Wesley)
11. <http://nptel.iitm.ac.in/video.php?subjectId=106105077>
12. http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Artificial%20intelligence/New_index1.html
13. <http://nptel.iitm.ac.in/video.php?subjectId=106105079>

MCA312: CRYPTOGRAPHY AND NETWORK SECURITY

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT - I

INTRODUCTION: Attacks, Services, and Mechanisms, Security Services.

CONVENTIONAL ENCRYPTION: CLASSICAL TECHNIQUES: Steganography, Classical Encryption Techniques.

CONVENTIONAL ENCRYPTION: MODERN TECHNIQUES:- Simplified DES. The Data Encryption Standard, Differential and Linear Cryptanalysis, Block Cipher Modes of Operation.

UNIT - II

CONFIDENTIALITY USING CONVENTIONAL ENCRYPTION: - Traffic Confidentiality, Random Number Generation.

PUBLIC-KEY CRYPTOGRAPHY: - Principles of Public-Key Cryptosystems, the RSA Algorithm, Diffie-Hellman Key Exchange, Elliptic Curve Cryptography.

INTRODUCTION TO NUMBER THEORY: - Prime and Relatively Prime Numbers, Fermat's and Euler's Theorem, Euclid's Algorithm, The Chinese Remainder Theorem, And Discrete Logarithms.

UNIT - III

MESSAGE AUTHENTICATION AND HASH FUNCTIONS: - Authentication Requirements, Authentication Functions, Message Authentication Codes, Hash Functions, Security of Hash Functions and MACs.

DIGITAL SIGNATURES AND AUTHENTICATION PROTOCOLS: - Digital Signatures, Authentication Protocols, Digital Signature Standard.

UNIT - IV

ELECTRONIC MAIL SECURITY: S/MIME.

IP SECURITY: IP Security Overview, IP Security Architecture, Encapsulating Security Payload, Key Management. FIREWALLS: Firewall Design Principles, Trusted Systems.

TEXT BOOK

1. CRYPTOGRAPHY AND NETWORK SECURITY principles and Practice FOURTH Edition By William Stallings (Pearson Asia)

REFERENCE BOOKS

1. DAVIES & PRICE : SECURITY FOR COMPUTER NETWORKS - Wiley (1984)
2. MAYER & MATYAS : CRYPTOGRAPHY – Wiley B. SCHNEIER : APPLIED CRYPTOGRAPHY - (John Wiley)
3. CRYPTOGRAPHY IN C AND C++ :WEISCHANBACH – A PRESS
4. CRYPTOGRAPHY MYSTIFIED :HERSHEY
5. Introduction to cryptography BY J A Buchanan (Springer)
6. <http://nptel.iitm.ac.in/syllabus/syllabus.php?subjectId=106105031>

MCA313: MOBILE COMMUNICATIONS

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT - I

Introduction to Mobile Communications and Computing: Mobile Computing (MC) : Introduction to MC, novel applications, limitations, and architecture.

GSM : Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

(Wireless) Medium Access Control: Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

UNIT - II

Mobile Network Layer: Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

Mobile Transport Layer : Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/ fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

UNIT - III

Database Issues: Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

Data Dissemination: Communications asymmetry, classification of new data delivery mechanisms, push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

UNIT - IV

Mobile Ad hoc Networks (MANETs): Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.

Protocols and Tools : Wireless Application Protocol-WAP. (Introduction, protocol architecture, and treatment of protocols of all layers), Bluetooth (User scenarios, physical layer, MAC layer, networking, security, link management) and J2ME.

TEXT BOOKS

1. Jochen Schiller, "Mobile Communications", Addison-Wesley. (Chapters 4,7,9,10,11), second edition, 2004.
2. Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", Wiley, 2002 (Chapters 11, 15, 17, 26 and 27)

REFERENCE BOOKS

1. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, October 2004.
2. Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden, Schwiebert, Loren, "Fundamentals of Mobile and Pervasive Computing", McGraw-Hill Professional, 2005.
3. Hansmann, Merk, Nicklous, Stober, "Principles of Mobile Computing", Springer, second edition, 2003.
4. Martyn Mallick, "Mobile and Wireless Design Essentials", Wiley DreamTech, 2003.
5. <http://nptel.iitm.ac.in/syllabus/syllabus.php?subjectId=106104023>

MCA314-A: ELECTIVE-I: DESIGN AND ANALYSIS OF ALGORITHMS

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT I

Introduction: Algorithm, Psuedo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Amortized analysis.
Disjoint Sets- disjoint set operations, union and find algorithms, spanning trees, connected components and connected components.

UNIT II

Divide and conquer: General method , applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.
Greedy method: General method, applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT III

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.
Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

UNIT IV

Branch and Bound: General method, applications - Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.
NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP - Hard and NPComplete classes, Cook's theorem.

TEXT BOOKS

1. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharam, Galgotia publications pvt. Ltd.
2. Algorithm Design: Foundations, Analysis and Internet examples, M.T. Goodrich and R. Tomassia, John Wiley and sons.

REFERENCE BOOKS

1. Introduction to Algorithms, second edition, T.H. Cormen, C.E. Leiserson, R.L. Rivest, and C. Stein, PHI Pvt. Ltd./ Pearson Education.
2. Introduction to Design and Analysis of Algorithms A strategic approach, R.C.T. Lee, S.S. Tseng, R.C. Chang and T. Tsai, Mc Graw Hill.
3. Data structures and Algorithm Analysis in C++, Allen Weiss, Second edition, Pearson education.
Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.
4. Algorithms – Richard Johnson Baugh and Marcus Schaefer, Pearson Education

MCA314-B: DISTRIBUTED OPERATING SYSTEMS

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT – I

Introduction to Distributed Systems: Definition of Distributed systems – Hardware Concepts – Software concepts.

Communication in Distributed systems: The Client – Server model – Remote Procedure Call – Group Communication.

UNIT - II

Synchronization in Distributed Systems: Clock Synchronization – Mutual Exclusion – Election Algorithms – Atomic Transactions – Deadlock in Distributed Systems. **Processes and Processors in Distributed Systems:** Threads – System Models – Processor Allocation – Scheduling in Distributed Systems – Real time Distributed Systems.

UNIT - III

Distribute File Systems: Distributed File System Design – Distributed File System implementation – Trends in Distributed file systems. **Distributed Shared Memory:** Concept of Shared Memory – Consistency Models – Page –based Distributed Shared Memory – Shared-variable Distributed Shared Memory.

UNIT IV

Introduction to MACH: Introduction – Process Management in MACH – Memory Management in MACH – communication in MACH – Unix Emulation in MACH.

TEXT BOOK

1. Distributed Operating Systems, Prof. A. S. Tanenbaum, Pearson

REFERENCE BOOKS

2. Silberschatz, Peter Galvin, Breg Gagne, Applied Operating System Concepts, John Wiley & sons
3. Operating Systems, William Stallings (Pearson)
4. Advanced concepts in Operating Systems , M. Shigha & NG shirvratri (TMH)
5. Distributed Systems Concepts & Design By G Coulouris et al (Pearson)
6. Distributed Systems and Networks By Buchanan (TMH)

MCA314-C: ELECTIVE-II: e-COMMERCE

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT – I

Traditional Commerce Electronic Commerce-Economic forces& Electronic Commerce-Value Chains in Electronic Commerce-SWOT Analysis- Internet and World Wide Web-Packet Switched Networks-Internet Protocols – Markup Languages and the Web- Intranets and Extranets – INTERNET connection Options – Revenue Models for selling on the Web – Revenue Models in Transition – Revenue strategy Issues – Creating an Effective Web Presence – Web Marketing Strategies – Advertising on the Web – Creating and Maintaining Brands on the Web – Search Engine positioning and Domain Names

UNIT – II

Purchasing, Logistics and Support purchasing – Electronic Data Interchange – EDI on the Internet – Supply Chain Management – Electronic Marketplaces and portals – Web auctions and Related Businesses – virtual Community and portal Strategies – International Nature of Electronic Commerce – Legal environment of Electronic Commerce – Ethical Issues – Taxation and Electronic Commerce

UNIT – III

Web Server Hardware and Software – Software for Web Servers – Website and Internet Utility programs – Web Server Hardware – Web Hosting Choices –Electronic Commerce Software – Advanced functions of Electronic Commerce software – Electronic commerce software for small and mid sized companies- electronic commerce software for medium sized to large businesses – Electronic commerce Software for large Businesses – Internet security Issues overview – Intellectual Property threats – Threats to the Security of client Computers – Threats to the Security of Communication Channels – Threats to the Security of Server Computers

UNIT – IV

Electronic Commerce Security Objectives – Protecting Client Computers – Protecting electronic Commerce Communication Channels – Protecting the Web Server – Payment Systems for Electronic commerce – Payment Cards – Electronic Cash – Electronic Wallets – Stored Value Cards – Planning for Electronic Commerce – Strategies for Developing Electronic Commerce Web Sites – Managing electronic Commerce Implementations

TEXT BOOK

ELECTRONIC COMMERCE, Gary P Schneider –Thomson Publishers

REFERENCE BOOKS

1. ELECTRONIC COMMERCE BY ELIAS M AWAD (PEARSON)
2. FRONTIERS OF ELECTRONIC COMMERCE BY KALAKOTA & WHINSTON (PEARSON)
3. e- COMMERCWE BY J F RAYPORT, B J JAWORSKI (TMH)

MCA315-A: ELECTIVE-II: DESIGN PATTERNS

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT – I

Introduction: What Is a Design Pattern? Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

A 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.

UNIT- II

Creational Patterns: Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns. Structural Pattern Part-I: Adapter, Bridge, composite.

UNIT- III

Structural Pattern Part-II: Decorator, arcade, Flyweight, Proxy. Behavioral Patterns Part-I : Chain of Responsibility, Command, Interpreter, Iterator.

UNIT- IV

Behavioral Patterns Part-II: Mediator, Memento, Observer, State, Strategy, Template Method, Visitor, Discussion of Behavioral Patterns.

What to Expect from Design Patterns, A Brief History, The Pattern Community An Invitation, A Parting Thought.

TEXT BOOK

1. Design Patterns by Erich Gamma, Pearson Education

REFERENCE BOOKS

1. Pattern's in JAVA Vol-I By Mark Grand, Wiley DreamTech.
2. JAVA Enterprise Design Patterns Vol-III By Mark Grand, Wiley DreamTech.
3. Head First Design Patterns By Eric Freeman-Oreilly-spd
4. Design Patterns Explained By Alan Shalloway, Pearson Education.

MCA315-B: ELECTIVE-II: CLOUD COMPUTING

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

UNIT – I

Introduction: Essentials, Benefits and need for Cloud Computing - Business and IT Perspective - Cloud and Virtualization - Cloud Services Requirements - Cloud and Dynamic Infrastructure - Cloud Computing Characteristics Cloud Adoption.

Cloud Models: Cloud Characteristics - Measured Service - Cloud Models - Security in a Public Cloud Public versus Private Clouds - Cloud Infrastructure Self Service

Cloud as a Service: Gamut of Cloud Solutions - Principal Technologies - Cloud Strategy Cloud Design and Implementation using SOA - Conceptual Cloud Model - Cloud Service Defined

UNIT – II

Cloud Solutions: Cloud Ecosystem - Cloud Business Process Management - Cloud Service Management - Cloud Stack - Computing on Demand (CoD) – Cloud sourcing.

Cloud Offerings: Information Storage, Retrieval, Archive and Protection - Cloud Analytics Testing under Cloud - Information Security - Virtual Desktop Infrastructure - Storage Cloud.

Cloud Management: Resiliency – Provisioning - Asset Management - Cloud Governance - High Availability and Disaster Recovery - Charging Models, Usage Reporting, Billing and Metering.

UNIT – III

Cloud Virtualization Technology: Virtualization Defined - Virtualization Benefits - Server Virtualization - Virtualization for x86 Architecture - Hypervisor Management Software - Logical Partitioning (LPAR) - VIO Server - Virtual Infrastructure Requirements.

Cloud Virtualization: Storage virtualization - Storage Area Networks - Network-Attached storage - Cloud Server Virtualization - Virtualized Data Center.

UNIT – IV

Cloud and SOA: SOA Journey to Infrastructure - SOA and Cloud - SOA Defined - SOA and IaaS - SOA-based Cloud Infrastructure Steps - SOA Business and IT Services.

Cloud Infrastructure Benchmarking: OLTP Benchmark - Business Intelligence Benchmark - e-Business Benchmark - ISV Benchmarks - Cloud Performance Data Collection and Performance Monitoring Commands - Benchmark Tools.

Text Book: Cloud Computing – Insight into New Era Infrastructure, Dr. Kumar Saurabh, Wiley India.

Reference Books:

1. Cloud Computing, Roger Jennings, Wiley India
2. Cloud Computing Explained, John Rhoton, Recursive Press
3. Cloud Computing Bible, Barry Sosinsky, Wiley
4. Cloud Computing: Principles and Paradigms, Rajkumar Buyya, James Broberg, Wiley
5. Cloud Computing for Dummies, Judith Hurwiz, Wiley Publishing.
6. The Cloud at your service, Rosenberg and Matheos, Manning Publications

MCA315-C: ELECTIVE-II: COMPUTER GRAPHICS

Workload: 4 PPW

Marks: University Exam – 80: Internal Exam - 20

U N I T - I

Geometry and Line Generation

Introduction, lines, line segments, pixels and frame buffers, vector generation, Bresenham's algorithm, antialiasing of lines, thick line segments, character generation, displaying the frame buffer.

Graphics primitives

Introduction, display devices, primitive operators, the display-file interpreter, normalized device coordinates, display-file structure, display-file algorithms, display control, text, line style primitive.

(Chapters 1 & 2)

U N I T - II

Polygons

Introduction, polygons, polygon representation, entering polygons, an inside test, polygon interfacing algorithms, filling polygons, initialization, antialiasing

Transformations

Introduction, matrices, scaling transformations, sin and cos, rotation, homogeneous coordinates and translation, rotation about an arbitrary point, inverse transformations, transformation routines, display procedures.

(Chapters 3 & 4)

U N I T - III

Segments

Introduction, the segment table, segment creation, closing a segment, deleting a segment, renaming a segment, visibility, saving and showing segments, other display-file structures.

(Chapter 5)

U N I T - IV

Windowing and clipping

Introduction, the viewing transformation, viewing transformation implementation, clipping, the Cohen-Sutherland outcode algorithm, the Sutherland-Hodgman algorithm, the clipping of polygons, adding clipping to the system, generalized clipping, multiple windowing.

(Chapter 6)

TEXT BOOKS

1. Computer graphics- a Programming approach, Steven Harrington(TM).

MCA316: MULTI MEDIA & Rich Internet Applications Lab

Workload: 4 PPW

Marks: University Exam – 50

Web 2.0 and Rich Internet Applications with Adobe Flash, Flex and Ajax:

Adobe Flash: Flash movie development, Creating Special Effects, Creating website splash screen, action script.

Adobe Flex 2: Creating and customizing simple user interface, Accessing XML data, interacting with server side applications, creating charts and graphs.

Rich Internet Applications with Ajax.

MCA317: J2EE Lab

Workload: 4 PPW

Marks: University Exam – 50

The following Topics are to be covered.

J2EE Platform, XML Fundamentals, Application Servers, RMI, Servlet Programming, JSP Basics, JSP: tag extensions, Javamail, Java Messaging Service, Java Transactions, Java Cryptography Extensions, EJB architecture and design, session Beans and Business logic, Entity Beans, Message Driver Beans, J2EE Connect or architecture, Web Services.

Scope: Chapters 1 to 20 of J2EE 1.4 Bible (Dreamtech-2003)

Reference Books

1. Mastering EJB by Roman (John Wiley)
2. J2EE by Wrox (SPD)
3. J2EE 1.4 By A.E.Walsh (Dreamtech)
4. PROFESSIONAL JAVA SERVER PROGRAMMING ALLAMRAJU ET aL.

MCA318: GUI PROGRAMMING LAB with VC++

Workload: 4 PPW

Marks: University Exam – 50

ASSIGNMENTS:

1. Creating home pages for institutions and organizations
2. On line shopping
3. Online examinations
4. Chat system
5. Mailing system
6. Building of E-Commerce portals
7. Building a Visual C ++ application.
8. Controls usage, Mouse and keyboard integrating applications.
9. Working with timers and adding dialog boxes.
10. Creating menus
11. Incorporating graphics, drawings and Bitmaps and Active X controls to an application.
12. Creating single and multiple documents Interface applications.
13. Adding tool bars and status bars.
14. File access and retrieving data from an ODBC database.
15. Updating and Adding database records through ADO.
16. Creating your own classes and modules.
17. Creating DLLs.
18. Multi-tasking
19. Creating Active X controls
20. Internet Application and Network communications.
21. Adding WEB browsing functionality to Applications.