

**KAKATIYA UNIVERSITY, WARANGAL**  
**DEPARTMENT OF INFORMATICS**  
**COUSE STRUCTURE WITH EFFECT FROM 2009-10**

**MCAC I SEMESTER**

Paper Code	Title	Workload Per Week		Marks		
		Theory	Practical	Sessional	University	Total
MCAC111	Problem Solving and Programming	4	--	20	80	100
MCAC112	Computer Organization	4	--	20	80	100
MCAC113	Discrete Mathematical Structures	4	--	20	80	100
MCAC114	Internet Technologies	4	--	20	80	100
MCAC115	Managerial economics	4	--	20	80	100
MCAC116	Problem Solving Lab	--	4		50	50
MCAC117	Internet Tech Lab	--	4		50	50
MCAC118	BDP Lab	--	4		50	50

**MCAC II SEMESTER**

Paper Code	Title	Workload Per Week		Marks		
		Theory	Practical	Sessional	University	Total
MCAC121	Data Structures	4	--	20	80	100
MCAC122	Object Oriented Programming	4	--	20	80	100
MCAC123	System Software	4	--	20	80	100
MCAC124	Operating Systems	4	--	20	80	100
MCAC120	Probability and Statistics	4	--	20	80	100
MCAC126	DS Lab	--	4		50	50
MCAC127	OOPS Lab	--	4		50	50
MCAC128	OS & SYSTEM SOFTWARE LAB	--	4		50	50

### MCAC III SEMESTER

Paper Code	Title	Workload Per Week		Marks		
		Theory	Practical	Sessional	University	Total
MCAC211	Database Management Systems	4	--	20	80	100
MCAC212	Data Communication and Networks	4	--	20	80	100
MCAC213	Software Engineering	4	--	20	80	100
MCAC214	Principles of Management	4	--	20	80	100
MCAC215	.NET Programming	4	--	20	80	100
MCAC216	DBMS Lab	--	4		50	50
MCAC217	Soft Ware Testing Lab	--	4		50	50
MCAC218	.NET Lab	--	4		50	50

### MCAC IV SEMESTER

Paper Code	Title	Workload Per Week		Marks		
		Theory	Practical	Sessional	University	Total
MCAC221	Data Mining	4	--	20	80	100
MCAC222	Unix Network Programming	4	--	20	80	100
MCAC223	Advanced Java	4	--	20	80	100
MCAC224	Soft Ware engineering II	4	--	20	80	100
MCAC225	Accountancy and Financial Management	4	--	20	80	100
MCAC226	UNP Lab	--	4		50	50
MCAC227	Mini Project(Based on DBMS and Data Mining)	--	4		50	50
MCAC228	Advance Java Lab	--	4		50	50
MCAC229	Seminar	Satisfactory/Not Satisfactory				

## MCAC V SEMESTER

Paper Code	Title	Workload Per Week		Marks		
		Theory	Practical	Sessional	University	Total
MCAC311	Design Patterns	4	--	20	80	100
MCAC312	<b>Cryptography and network Security</b>	4	--	20	80	100
MCAC313	Visual Programming	4	--	20	80	100
MCAC314	Elective – I	4	--	20	80	100
MCAC315	Elective – II	4	--	20	80	100
MCAC316	<b>J2EE Lab</b>	--	4		50	50
MCAC317	Network Security Lab	--	4		50	50
MCAC318	Visual Programming Lab	--	4		50	50
MCAC319	Seminar	Satisfactory/Not Satisfactory				

**Note: Seminar will be conducted only by internal Staff .**

**\* Any one of the following has to be chosen from each group**

### **Elective-I**

1. Image Processing
2. Embedded Systems
3. Distributed Operating Systems
4. Design And Analysis of Algorithms
5. Human Computer Interaction

### **Elective-II**

1. Software Reuse
2. Software Projects Management
3. Parallel Processing
4. Mobile Communications
5. Pervasive Computing

## MCAC VI SEMESTER

Major Project Work	<b>Marks</b>		
	<b>Sessional</b>	<b>University</b>	<b>Total</b>
	<b>50</b>	<b>150</b>	<b>200</b>

Every college will conduct two internal Seminars in the sixth semester on the progress of the work done by each student and the average of the same same is taken for sessional marks

**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

UNIT-I

2.

- a)
- b)
- 
- c)
- d)

(OR)

UNIT-II

3.

- a)
- b)
- 
- c)
- d)

(OR)

UNIT-III

4.

- a)
- b)
- 
- c)
- d)

(OR)

UNIT-IV

5.

- a)
- b)
- 
- c)
- d)

(OR)

**WORK LOAD :4 PPW****UNIVERSITY MARKS:80****SESSIONAL MARKS :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.

**Rpetetion**

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 inheritance.

**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 - (McGrawHill)
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)

**WORK LOAD :4 PPW****UNIVERSITY MARKS:80****SESSIONAL MARKS :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 SYTEMS HARDWARE BY I ENGLANDER (WILEY)
- 5 COMPUTER SYTEMS DESIGN AND ARCHITECTURE BY VP HEURING, HF JORDAN (PEARSON)
- 6 COMPUTER ORGANIZATION & ARCHITECTURES BY STALLINGS (PEARSON, PHI)

**WORK LOAD :4 PPW****UNIVERSITY MARKS:80****SESSIONAL MARKS :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)

## **MCAC 114: INTERNET TECHNOLOGIES**

**WORK LOAD :4 PPW**

**UNIVERSITY MARKS:80**

**SESSIONAL MARKS :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 Stylesheets – 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, onfocus, 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 Stylesheet Language and XSL Transformations, Document Object Model (DOM).

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

**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 Basica by Ned Snell, Bob Temple, TM Clark (Pearson)

**WORK LOAD :4 PPW****UNIVERSITY MARKS:80  
SESSIONAL MARKS :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:**

8. JOEL DEAN - MANAGERIAL ECONOMICS
9. P.L. MEHTA - MANAGERIAL ECONOMICS
10. TREVETT – MANAGERIAL ECONOMICS (WILEY)
11. MANAGERIAL ECONOMICS BY PETERSEN (PEARSON)

**WORK LOAD :4 PPW**

**UNIVERSITY MARKS: 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)**

## MCAC117 :INTERNET TECHNOLOGIES LAB

WORK LOAD :4 PPW

UNIVERSITY MARKS: 50

1. Create a simple HTML page which demonstrate 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 contains 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"	"F2"
Course: <u>PG</u> <u>UG</u>	<<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 botton	

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.

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

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:**

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

### **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.

**Multiway 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. Gregory L. Heileman, Data Structures, Algoritihms, And Object - Oriented Programming, TMH.
3. Michael Main Walter Savitch, Data Structures and Other Objects Using C ++, Pearson.
4. Michael T. Goodrich Roberto Tamassia David Mount, Data Structures and Algorithms, in C ++, John wiley & Sons.
5. Ellis Horowitz Sartaj Shani Dinesh Mehta, Fundamentals of Data Structures in C ++, Galgotia.
6. Adam Drozdek, Data Structures and Algorithms in C ++ , Vikas Publishing House.
7. Bruno R. Preiss, Data Structures And Algorithms with Object – Oriented Design Patterns in C ++ , John wiley & Sons.
8. Data Structures Via C ++ - A.M. Berman (Oxford)
9. Data Structures, Algorithms & OOPS – G.L. Heilmann (TMH)
10. Data Structures and the Standard Template library – W.J. Collins (TMH)
11. Applied Data Structures C ++ - P. Smith (Narosa)
12. DATA STRUCTURES & ALGORITHM ANALYSIS IN C ++ BY – MARK ALLEN WEISS.

### 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 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)
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)

**WORK LOAD :4 PPW****UNIVERSITY MARKS:80****SESSIONAL MARKS :20****U N I T – 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. **(FROM TEXT BOOK NO 2) (CHAPTERS 2,4,5,6,7,8)**

**U N I T – 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

**U N I T – 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

**U N I T – 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 - (ADDISON WESLEY)
2. ASSEMBLY LANGUAGE PROGRAMMING FOR THE IBM PC FAMILY- WILLIAM B JONES (DREAMTECH)

**REFERENCE BOOK:**

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

**U N I T - 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)

**U N I T - 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)

**U N I T - 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)

**U N I T - 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)

**REFERENCT 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)

**WORK LOAD :4 PPW**

**UNIVERSITY MARKS:80  
SESSIONAL MARKS :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  $\chi^2$  Distributions.

**UNIT - II**

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

**UNIT - III**

TESTING OF STATISTICAL HYPOTHESIS:  $\chi^2$  Tests for Variance and for Distribution, 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)

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 converism of infix expressions to post fix notation simple expression evaluator that can handle +, -, /, \*.
12. String Operations using Linked lists.
13. Polynominal 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)

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 5<sup>TH</sup> 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 PROGRAMMING & 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)

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.