P R GOVT COLLEGE(A), KAKINADA
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc (CS) - Semester- III (W.E.F. 2020-2021)
Paper-II – OBJECT ORIENTED PROGRAMMING USING JAVA
Course code: CP3204

Total Hrs. of Teaching-Learning: 52 @ 4 h / Week   **Total Credits: 03**

Objective:
To develop proficiency in the specification, representation, and implementation of OOPS Concepts.

Outcomes: After completion of this course, student can able to understand:
1. The basic structure of Java Programming.
2. Object Oriented Programming features.

Module-1:   **12 Hrs**

FUNDAMENTALS OF OBJECT – ORIENTED PROGRAMMING: Introduction, Object Oriented paradigm, Basic Concepts of OOP, Benefits of OOP, Application's of OOP.
OVERVIEW OF JAVA LANGUAGE: Introduction, java features Simple Java program structure, difference between C, C++ and java, java and internet, Java tokens, Java Statements, Implementing a Java Program, Java Virtual Machine, Command line arguments.
CONSTANTS, VARIABLES & DATA TYPES: Introduction, Constants, Variables, Data Types, Declaration of Variables, Giving Value to Variables, Scope of variables, Symbolic Constants, Type casting, Getting Value of Variables, Standard Default values;

Module-2   **10 Hrs**

OPERATORS AND EXPRESSIONS : Arithmetic operators Relational operators, logical operators, Assignment operators, Increment and decrement operators, Conditional operators, Bitwise operators, Special operators, Arithmetic operators, Precedence of Arithmetic operators.
DECISION MAKING & BRANCHING: Introduction, Decision making with if statement, Simple if statement, if Else statement, Nesting of if else statements, the else if ladder, the switch statement, the conditional operator.
 DECISION MAKING & LOOPING: Introduction, The While statement, the do-while statement, the for statement, Jumps in loops. CLASSES, OBJECTS & METHODS: Introduction, Defining a class, Adding variables, Adding methods, Creating objects, Accessing class members, Constructors, Method overloading, Static members, Nesting of methods, visibility controls.

Module-3:   **10 Hrs**

INHERITANCE: inheritance and types of inheritances, Extending a class, Overloading methods, Final variables and methods, Final classes, Abstract methods and classes.
ARRAYS, STRINGS AND VECTORS: Arrays, One-dimensional arrays, Creating an array, Two – dimensional arrays, Strings, Vectors, Wrapper classes.
INTERFACES: MULTIPLE INHERITANCE: Introduction, Defining interfaces, Extending interfaces, Implementing interfaces, Assessing interface variables;

Module-4:   **10 Hrs**

MULTITHREADED PROGRAMMING: Introduction, Creating Threads, Extending the Threads, Stopping and Blocking a Thread, Lifecycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization, Implementing the 'Runnable' Interface.
MANAGING ERRORS AND EXCEPTIONS: Types of errors: Compile-time errors, Run-time errors, Exceptions, Exception handling, Multiple Catch Statements, Using finally statement.

Module-5:   **10 Hrs**
APPLET PROGRAMMING: local and remote applets, difference between Applets and Applications, Building Applet code, Applet Life cycle: Initialization state, Running state, Idle or stopped state, Dead state, Display state Designing web page, adding applet to HTML file, Running the Applet.
PACKAGES: Introduction, Java API Packages, Using System Packages, Naming conventions, Creating Packages, Accessing a Package, using a Package, Adding class to a package, Hiding classes, static Import.

Prescribed Book:
1. E .Balaguru swamy, Programming with JAVA, A primer, 3e, TATA McGraw-Hill
Company. Reference Books: 1. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series, TMH.
2. Deitel &Deitel. Java TM: How to Program, PHI (2007)
3. Java Programming: From Problem Analysis to Program Design- D.S Mallik
4. Object Oriented Programming Through Java by P. Radha Krishna, Universities Press (2008)
5. Java complete reference.
Reference Books:
   1. Java for Programmers, P.J.Deital and H.M.Deital, Pearson Education
   2. Object Oriented Programming Through Java, P.Radha Krishna, Universities Press.

SUBJECT: OBJECT ORIENTED PROGRAMMING USING JAVA   Time: 2½ Hrs
PAPER- II   Marks: 60

Model blue print for the model paper and choice

S.NO	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Section-A Very Short Questions	5	1	5	5	1	5
2	Section-B Short Questions	6	5	30	3	5	15
3	Section-C Essay Questions	8	10	80	4	10	40
TOTAL MARKS				**115**	**TOTAL MARKS**		**60**

Percentage of choice given = $\dfrac{115 - 60}{115}$ x 100= $\dfrac{55}{115}$ x 100 = 47.82%

P.R.GOVT.COLLEGE (AUTONOMOUS), KAKINADA
MODEL PAPER (W.E.F. 2020-2021)
II B.Sc (CS) Course code: CP3204
SUBJECT: OBJECT ORIENTED PROGRAMMING USING JAVA   Time: 2½ Hrs
PAPER-II   Marks: 60
SEMESTER-III

Section – I

Answer any all questions   **5 x 1 = 5M**
1. Define JVM.
2. Define Constant.
3. What is an Operator?
4. Define class and Object.
5. Define Interface.

Section –II
Answer any 3 questions   **3 x 5 =15M**
6. What are the data types supported by Java?
7. Explain the Conditional Statements in Java.
8. Discuss Abstract classes and Methods.
9. Discuss Method Overloading.
10. Explain about Final variables and Methods.
11. How can you implement Interfaces?

Section –III
Answer all the questions   **4 x 10 = 40M**

12. A. Explain the features of Object Oriented Programming.

    (OR)
   B. What is an Operator? Explain the Types of Operators in Java.

13. A. Explain the Decision Making and Looping Statements in Java.
    (OR)
   B. How is Multiple Inheritance handled in Java Programming?

14. A..Explain how handling Exceptions in Java?

    (OR)
   B. Explain about Life cycle of a Thread?.

15. A. Explain about Life cycle of an Applet?
    (OR)
   B. What is a Package? Explain the creation of Package in Java.

SUBJECT: OBJECT ORIENTED PROGRAMMING USING JAVA   **Time: 2½ Hrs**
PAPER-II   **Marks: 60**

Model Blue print for the question paper setter

Chapter Name	Essay Questions 10 Marks	Short Questions 5 Marks	Very Short Questions 1 Marks	Marks allotted to the chapter
Module-1	2	2	1	31
Module-2	1	1	1	16
Module-3	1	1	1	16
Module-4	2	1	1	26
Module-5	2	1	1	26
Total No. of questions	8	6	5	
Total Marks Including choice				115

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA
PRACTICALS (W.E.F. 2020—2021)
II B.Sc (CS) SEMESTER-III
PRACTICAL SYLLABUS
OBJECT ORIENTED PROGRAMMING USING JAVA
OBJECT ORIENTED PROGRAMMING USING JAVA LAB

Course code: CP3204P

1. Write a program to perform various String Operations
2. Write a program on class and object in java
3. Write a program to illustrate Function Overloading & Function Overriding methods in Java
4. Write a program to illustrate the implementation of abstract class
5. Write a program to implement Exception handling
6. Write a program to create packages in Java
7. Write a program on interface in java
8. Write a program to Create Multiple Threads in Java
9. Write a program to Write Applets to draw the various polygons
10. Write a program which illustrates the implementation of multiple Inheritance using interfaces in Java
11. Write a program to assign priorities to threads in java

P R GOVT COLLEGE(A), KAKINADA
DEPARTMENT OF COMPUTER SCIENCE
II B.Sc (CS) SYLLABUS PAPER (W.E.F. 2020-2021)
Course Code: CP4204
SEMESTER-IV

Course: Data Structures   **Paper: II**
Total Hrs. of Teaching-Learning: 52 @ 4 h / Week   **Total Credits: 03**

Course Objectives

To introduce the fundamental concept of data structures and to emphasize the importance of data structures in developing and implementing efficient algorithms.

Course Outcomes

After completing this course satisfactorily, a student will be able to:

1. Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are representedin memory and used by algorithms
2. Describe common applications for arrays, records, linked structures, stacks, queues, trees, andgraphs.
3. Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs
4. Demonstrate different methods for traversing trees
5. Compare alternative implementations of data structures with respect to performance
6. Compare and contrast the benefits of dynamic and static data structures implementations
7. Describe the concept of recursion, give examples of its use, describe how it can be implemented using a stack .
8. Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.

SEMESTER – IV

Module-1   **12 Hrs**

Concept of Abstract Data Types (ADTs)-
Data Types, Data Structures, Primitive and Nonprimitive Data Structures, Linear and Non-linear Data Structures. Linear Lists– ADT, Array and Linked representations, Pointers.

Arrays:
One Dimensional-Two Dimensional-Multi Dimensional-Operations-Sparse Matrices. Linked Lists: Single Linked List, Double Linked List, Circular Linked List , applications

Module-2   **10 Hrs**

Stacks:
Definition, ADT, Array and Linked representations, Implementations and Applications

Queues:
Definition, ADT, Array and Linked representations, Circular Queues, Dequeues, Priority Queues, Implementations and Applications. UPDATED.

Module-3:   **10 Hrs**

Trees:
Binary Tree, Definition, Properties, ADT, Array and Linked representations, Implementations and Applications.

Binary Search Trees (BST) –
Definition, ADT, Operations and Implementations, BST Applications. Threaded Binary Trees, Heap trees.

Module-4:   10 Hrs
Graphs –
Graph and its Representation, Graph Traversals, Connected Components, Basic Searching Techniques, Minimal Spanning Trees

Module-5:   10 Hrs
Sorting and Searching:
Selection, Insertion, Bubble, Merge, Quick, Heap sort, Sequential and Binary Searching.

REFERENCE BOOKS
1. D S Malik, Data Structures Using C++, Thomson, India Edition 2006.
2. Sahni S, Data Structures, Algorithms and Applications in C++, McGraw-Hill, 2002.
3. SamantaD, Classic Data Structures, Prentice-Hall of India, 2001.
4. Heilman G I,.Data Structures and Algorithms with Object-Oriented Programming, Tata McGraw-l lill. 2002. (Chapters I and 14).
 5. Tremblay P, and Sorenson P G, Introduction to Data Structures with Applications, Tata McGraw-Hill,
Student activity: 1. Create a visible stack using C-graphics
                                 2. Create a visible Queue using C-graphics

SUBJECT: Data Structures   **Time: 2½ Hrs**
PAPER- II   **Marks: 60**

Model blue print for the model paper and choice

S.NO	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Section-A Very Short Questions	5	1	5	5	1	5
2	Section-B Short Questions	6	5	30	3	5	15
3	Section-C Essay Questions	8	10	80	4	10	40
TOTAL MARKS				115	TOTAL MARKS		60

Percentage of choice given = $\dfrac{115 - 60}{115}$ x 100= $\dfrac{55}{115}$ x 100 = 47.82%

P. R. GOVT COLLEGE (AUTONOMOUS), KAKINADA
MODEL PAPER (W.E.F. 2020-2021)
II B.SC (CS)
SEMESTER –IV
Course Code: CP4204

Subject: Data Structures   **Paper: IV**

Time: 2½ hrs   **Marks: 60**

SECTION – I

Answer all Questions   **5×1 = 5M**

1. What is ADT?
2. Define Array.
3. Define Stack.
4. What is BST?
5. What is Graph?

SECTION – II

Answer any THREE Questions   **3 x 5 = 15M**

6. Explain the Primitive Data Structures.
7. Explain Stack operations.
8. Explain about Tree implementations and applications.
9. Explain Minimal Spanning Trees?
10. Explain about Binary Searching.
11. Explain Insertion Sort.

SECTION – III

Answer all the Questions   **4 x 10 = 40 M**

14. A. What are the goals of data structure? Write note on linear and Non Linear data structure with examples.

OR

B. What is Array? Explain about types of Arrays with syntax and suitable examples

15. A. What is a stack? Explain the algorithm to create and delete items In stack.

OR

B. What is a queue? Explain the algorithms to create and delete Items in a circular queue.

16. A. Write an algorithm to delete operation in any binary search tree.

OR

B. Explain the below: i) Binary search tree ii) Heaps

17. A. What is Minimal Spinning tree? Write about breadth first search Technique?

OR

B. What is a graph? How a graph can be represented in memory? Write an algorithm to delete an edge from a graph.

SUBJECT: Data Structures   **Time: 2½ Hrs**
PAPER-II   **Marks: 60**

Model Blue print for the question paper setter

Chapter Name	Essay Questions 10 Marks	Short Questions 3 Marks	Very Short Questions 1 Marks	Marks allotted to the chapter
Module-1	2	2	1	31
Module-2	1	1	1	16
Module-3	1	1	1	16
Module-4	2	1	1	26
Module-4	2	1	1	26
Total No. of questions	8	6	5	
Total Marks Including choice				115

SCHEME OF VALUATION (W.E.F. 2020-2021) – PAPER II

Time: **2** Hrs   Marks: 100

Practical/Laboratory – II

1. Internal Practicals   40 Marks
2. External Practicals   60 Marks

SEMESTER-IV

DATA STRUCTURES USING JAVA LAB

1. Write a Program to implement the Linked List operations

2. Write a Program to implement the Stack operations using an array.

3. Write Programs to implement the Queue operations using an array.

4. Write Programs to implement the Stack operations using a singly linked list.

5. Write Programs to implement the Queue operations using a singly linked list.

6. Write a program for arithmetic expression evaluation

7. Write a program to implement Double Ended Queue using a doubly linked list.

8. Write a program to search an item in a given list using Linear Search and Binary Search

9. Write a program for Quick Sort

10. Write a program for Merge Sort

11. Write a program on Binary Search Tree operations(insertion, deletion and traversals)

12. Write a program for Graph traversals.