

Subject: Object Oriented Programming Methodology (OOPM)

Term: ODD(2022-2023)

Class/Semester: SY/III

Course Outcome	After successful completion of the course students should be able to
CO1	Understand the features of object oriented programming compared with procedural approach with C++ and Java
CO2	Explore arrays, vectors, classes and objects in C++ and Java.
CO3	Implement scenarios using object oriented concepts (Drawing class diagram, relationship between classes)
CO4	Explore the interface, exceptions, multithreading, packages

List of Experiments

Sr. No.	Experiment Title	Co Mapping
1	<p>Define a class Complex to implement complex numbers and define various mathematical functions for :</p> <p>Addition of Complex numbers</p> <p>Subtraction of Complex numbers</p> <p>Complex multiplication</p> <p>Division of Complex numbers</p> <p>Display appropriate results of all the functionalities in main using a menu driven approach.</p> <p>Variations :</p> <p>Implementation of Program with One class</p> <p>Accessibility with static and non-static methods within class and outside class.</p>	CO2
2	<p>Create a class myMath. The class contains the following static methods.</p> <p>i) power (x, y) – to compute x^y</p> <p>ii) fact (x) – to compute $x!$</p> <p>Write a program to find the following series.</p>	CO2

	<p>$e^x = 1 + (x/1!) + (x^2/2!) + (x^3/3!) + (x^4/4!) + \dots$ upto n terms (n given by user).</p> <p>$(1+x)^n = 1 + (nx/1!) + ((n(n-1)x^2)/2!) \dots$ upto n terms (n given by user).</p> <p>(Do not make use of inbuilt functions. Use the functions of user defined class MyMath.)</p>	
3	<p>Write a program which stores information about n players in a two dimensional array. The array should contain the number of rows equal to the number of players. Each row will have number of columns equal to number of matches played by that player which may vary from player to player. The program should display player number (index +1), runs scored in all matches and its batting average as output. (It is expected to assign columns to each row dynamically after getting value from the user.</p>	CO2
4	<p>Write a program which accepts information about n no of customers from user .Create an array of objects to store account_id ,name,balance.</p> <p>Your program should provide following functionalities</p> <ol style="list-style-type: none"> 1.To add account 2.To delete any account detail 3. To display account details. 	CO1,CO2
5	<p>Create a class Employee which stores E-Name, E-Id and E-Salary of an Employee. Use class Vector to maintain an array of Employees with respect to the E-Salary. Provide the following functions</p> <ol style="list-style-type: none"> 1) Create (): this function will accept the n Employee records in any order and will arrange them in the sorted order. 2) Insert (): to insert the given Employee record at appropriate index in the vector depending upon the E-Salary. 3) delete ByE-name (): to accept the name of the Employee and delete the record having given name 4) deleteByE-Id (): to accept the Id of the Employee and delete the record having given E-Id. 	CO2

6	<p>Draw class Diagram for the chosen Case Study. Clearly show</p> <ul style="list-style-type: none"> • Attributes • Multiplicities between classes • Aggregations/compositions/Association between classes • Generalization between classes in the class diagram. <p>And show the implementation of aggregation, association, composition and generalization between the classes.</p>	CO1,CO2,CO3,CO4
7	<p>User Defined Exception</p> <p>Create a user defined exception subclass TimeException with necessary constructors and overridden toString method. Write a program which accepts two integers with time in minutes and seconds and find the sum. It throws an object of the TimeException class if the value exceeds 60seconds otherwise it displays the total time. On printing, the exception object should display an exception name, appropriate message for exception.</p>	CO1,CO4
8	<p>Multithreading</p> <p>Write a java program that implements a multi-thread application that has three threads. First thread generates a random integer every 1 second and if the value is even, the second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of the cube of the number.</p>	CO1,CO4
9	<p>Packages</p> <p>Create a Package Engineering which has two classes as Student and Marks. Accept (n) student details like roll_no, Subject_name, Student_name, calculate total marks in the class Student Write display () method to display details and sort () method to sort the students records as per increasing order of the total marks. The function sort must be statically defined to invoke it without referring to any object. Both the functions are written in the Marks class.</p> <p>Create a main class which will use a package display all the records of the student in the increasing order of the their total marks.</p>	CO4

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