Name of The Faculty: Pardeep Kumar

Discipline : Comp. Engg.

Semester: IV

Subject: OOPS

Work Load(Lecture/Practical)per week(In hours):03- Lectures/06- Practicals

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| **Week** | **Theory** | | **Practical** | |
| **Lecture**  **Day** | **Topic(including assignment/Test)** | **Practical**  **Day** | **Topic** |
| 1st | 1st | **Introduction and Features**- Fundamentals of object oriented  programming | 1st | Installation of turbo c and c++ |
| 2nd | Procedure oriented programming Vs. object oriented programming (OOP) | 2nd | Basics of programming like data types,variables and constants |
| 3rd | Object oriented programming concepts  – Classes, reusability,encapsulation,inheritance,po lymorphism, dynamic binding, message passing, Data Hiding |
| 2nd | 4th | Benefits of OOPs and its Application | 3rd | Some basic programs of C++ like Factorial of a  number,Average of numbers |
| 5th | **Language Construct**s --Review of constructs of C used in C++: variables | 4th | Write a function using variables as arguments to swap the values of a pair of integers |
| 6th | Type and type declarations,user defined  data types |
| 3rd | 7th | Increment and decrement operators, relational and logical operators | 5th | Revision of last hour program and file checking |
| 8th | If then else clause;conditional expressions | 6th | Consider a shopping list of items for which we place an order with a dealer every month.The list includes such as the code number and price of each item .we would like to perform operations such as adding an item to the list,deleting an item from the list and printing the total value of the  order. |
| 9th | Input and output statement, loops |
| 4th | 10th | Arrays,switch case | 7th | Revision of last hour program and file checking |
| 11th | Structure, unions | 8th | Write a program to read name, roll no,internal  external marks using classes and display the same on the screen |
| 12th | Functions, pointers |
| 5th | 13th | Preprocessor directives and header files | 9th | Revision of last hour program and file checking |
| 14th | Scope Resolution Operator Managing  Console I/O Operations | 10th | Write a program of swapping of numbers by accessing private numbers using friend function |
| 15th | C++ Stream, Unformatted and  Formatted Console I/O |
| 6th | 16th | Assignment of unit 1 and 2 | 11th | Viva-voce |
| 17th | Test | 12th | Define a class to represent a bank account using constructor including the following members:- Data members i) For Single Customer ii) For n Customers a) Name of the depositors b) Account number c) Type of account d) Balance amount in the account Member function - To assign initial values - To deposit an amount - To withdraw an amount after checking the balance - To display the name and balance. |
| 18th | **Classes and Objects --**Creation, accessing class members |

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| 7th | 19th | Private Vs Public | 13th | Revision of last hour program and file checking |
| 20th | Constructor and Destructor with and without Arguments | 14th | Create 2 classes OM and DB which store the value of distance. DM store distances in Meters and cm and DB in feet and inches. Write a program that can read values for the class objects and add 1 object OM with another object of DB. Use a friend function to carry out the addition operation the object that stores the results may be a DM object or a DB object, depending upon the units in which the results are required. The display should be in the format of feet and inches or meters and cms depending on the object on display |
| 21st | Objects, Dynamic memory Allocation with new and Delete Operator |
| 8th | 22th | **Member Functions--**Method definition | 15th | Revision of last hour program and file checking |
| 23th | Inline Implementation, Constant  member functions | 16th | A book shop maintains the inventory of books that are being sold at the shop the list includes details such as author, title and publisher and stock position. Whenever a customer wants the book, the sales person inputs the title and author and the system search the list and display whether it is available ornot. If it is not, a appropriate message is displayed, if it is, then the system displays the book details and requests for the number of copies require. If the requested are available, the total cost of the required copies is displayed: otherwise the message" Required copies not in stock"is displayed. Design a system using a class called books with suitable member functions and constructors. Use new operator in constructor to allocate memory space require. |
| 24th | Static Function, This Pointer,Friend Function and its Characteristics |
| 9th | 25th | **Overloading Member Functions**--  Introduction to Operator Overloading, | 17th | Revision of last hour program and file checking |
| 26th | Prefix and postfix, overloading binary  operators | 18th | Define a class string that could work as a userdefined string type include constructors that will enable us to create an .un-initialized string String s1; :/ string with length 0 And also to initialize an object with string constant at the time of creation like String s2("well done"); . Include a function that adds two strings to make a third string. |
| 27th | Instream/outstream operator overloading, Constructor Overloading |
| 10th | 28th | Type conversion, Rules of Operator Overloading Comparison between Function Overloading and overriding | 19th | Revision of last hour program and file checking |
| 29th | Assignment of unit 3,4 and 5 | 20th | Create a class float that contains 2 float data member. Over load all the 4 arithmetic operators so that do operate on the objects of float |
| 30th | Test |

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| 11th | 31st | **Inheritance**---Definition of inheritance,Types of inheritance; Single inheritance, hierarchical inheritance, | 21st | Revision of last hour program and file checking |
| 32th | Multiple inheritance, hybrid inheritance  ,protected data, private data, | 22th | Programming Exercise on Hybrid Inheritance |
| 33th | Public/data, inheriting constructors and  destructors |
| 12th | 34th | Constructors fot virtual base classes,, constructors and destructors of derived  classes | 23th | Viva-voce |
| 35th | Virtual functions, size of a derived class, order of invocation | 24th | Define 2 classes POLAR and RECTANGLE to represent points in the POLAR and RECTANGLE systems. Use conversion routines to convert from one system to the other. |
| 36th | **Polymorphism and Virtual Functions**-- Importance of virtual function |
| 13th | 37th | Function call binding, virtual functions,implementing late binding | 25th | Revision of last hour program and file checking |
| 38th | Need for virtual functions,abstract base  classes | 26th | Create a base class called shape. use this class to store two double type values that could be used to compute the area of fig. Derive the specific class called TRIANGLE and RECTANGLE from the data shape. Add to base class, a member function get - data ( ) to initialize base class data members and another member and another member function display – area( ) to compute and display the area of the fig.. Make display – area ( ) as a virtual function and redefine function in the derived classes to suit their requirements, Using these 3 classes design a program that will accept dimension of RECTANGLE or TRIANGLE interactivity and display the area. |
| 39th | Pure virtual functions, virtual destructors |
| 14th | 40th | **File and Streams**-- Components of a file,  different operation of the file, | 27th | Revision of last hour program and file checking |
| 41st | Communication in files, creation of file  streams, stream classes | 28th | Exercise on file handling |
| 42th | Header files, updating of file, opening and closing a file,file modes |
| 15th | 43th | Filepointers and their manipulation,  function manipulation of file pointers, | 29th | Revision of last hour program and file checking |
| 44th | Assignment and Revision | 30th | Revision and viva-voce |
| 45th | Test |