**Institutional Training May 2012**

**Syllabus for Module 2 (C++)**

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| **DAY** | **WEEK 1 (2a)** | **WEEK 2 (2b)** |
| **1** | Functions:   * Structure of a function * Declaring function * Defining function * Return Statement | Overloading:   * Operator overloading * Function overloading |
| **2** | Functions:   * Call by value and call by reference * Recursion * Recursion V/s iteration * Storage classes * Inline functions | Pointers:   * Introduction to pointer * Accessing the address of a variable * Declaring and initializing pointer * Accessing a variable through its pointer * Pointer expression * Pointer increments |
| **3** | Classes and objects:   * Defining classes and declaring objects * Defining member functions inside and outside a class | Pointers:   * Relationship of pointers with 1D and 2D arrays. * Use of pointers in functions, classes & objects, operator overloading etc. |
| **4** | Classes and objects:   * Friend Function * Constructor and Destructor | File handling:   * Opening, reading and writing of files * File modes |
| **5** | Inheritance:   * Types of inheritance * Virtual base classes * Constructors in derived classes | File handling:   * Error handling during files operation * Input output operations * File pointers and their manipulation |

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**List of experiments:**

**Functions:**

1. Write a program with multiple functions that don’t communicate any data between them.
2. Write a program to print cube of a given number using a function.
3. Write a program using function that takes an int argument and doubles it. The function does not return a value.
4. Write a function that takes two int arguments and return zero. If both the arguments are equals the function returns -1, if the first argument is smaller and 1, if the second argument is smaller.
5. Write a function that takes a character argument and print it number of times that function has been called to the point.
6. Write a function to sum an n natural number starting from a given number.
7. Write a C++ function that compare two strings and return 0, if the two strings are equal and -1 if the strings are unequal.
8. Write a function to find a least common divisor of two integers.
9. Write a program to find the factorial of a given number using recursion.
10. Write a program to generate and print first n fibonacci numbers.
11. Write a program to swap two numbers using call value and call by reference.
12. Write a program to convert distance into feet or inches using call by reference method.

**Classes and objects:**

1. Writea program to read any five numbers using the class and print their average.
2. Writea program to find out the larger number from two numbers using the concept of class.
3. Writea program to declare and use both constructor and destructor.
4. Writea program to read an array and then sort that array, after sorting print the array by using constructor member function.
5. Writea program to find the sum of following series by using constructor member function.

12 + 22 + 32 + 42 + … n2

1. Writea program to calculate the factorial of a number by using the constructor and destructor member function.
2. Writea program to explain the concept of a friend function in a class.

**Inheritance, polymorphism and overloading**

1. Writea program to show the concept of inheritance.
2. Writea program to implement inheritance using private and protected identifier.
3. Writea program to show the concept of multiple inheritances.
4. Writea program to read a set of integers using the concept of overloading.
5. Writea program to do all the arithmetic operations using the concept of operator overloading.
6. Writea program to apply the use of increment operator by using unary operator overloading.
7. Writea program to join different strings by using logical AND operator and operator overloading.
8. Writea program using function overloading for adding two given integers.

**Pointers:**

1. Write a program to find the biggest no. among two no.’s using pointer.
2. Write a program to compute number of boys and number of girls using the pointer.
3. Write a program to add two matrices using pointer.
4. Write a program to print a table using pointer.
5. Write a program to reverse a string using pointer.
6. Write a program to sort the number using pointer.
7. Write a program to find the roots of quadratic equation using pointer.
8. Write a program to find sum of rows and columns in a matrix using pointer.
9. Write a program to reverse a numeric array using pointer.
10. Write a program to find a character in a string using pointer,

**File handling**

1. Writea program to get roll number and marks of students of a class and store these details into a file named Marks.dat.
2. Writea program to create a single file and then display its contents.
3. Writea program to use multiple files in succession.
4. Writea program to use multiple files simultaneously.
5. Writea program to display contents of a file using get() function.
6. Writea program to create a file using put() function.
7. Writea program to append data in a file.
8. Writea program to delete a record from a file.