Course Number and Name

BCS406-OBJECT ORIENTED PROGRAMMING AND DATA STRUCTURES

Credits and Contact Hours

3 and 45

Course Coordinator's Name

Dr. C.Nalini

Text Books and References

References:

1. Deitel and Deitel,—C++,How To Program ,Fifth Edition, Pearson Education, 2005.
2. BhushanTrivedi,—Programming withANSIC++,AStep-By-Stepapproach , Oxford University Press, 2010.
3. Goodrich, Michael T., Roberto Tamassia,DavidMount, —Data Structuresand Algorithms in C++ , 7th Edition, Wiley. 2004
4. Thomas H. Cormen, CharlesE. Leiserson, RonaldL. Rivest andClifford Stein, "Introduction to Algorithms", Second Edition, McGraw Hill, 2002.
5. BjarneStroustrup,—TheC++ProgrammingLanguage ,3rdEdition,Pearson Education,2007
6. EllisHorowitz,SartajSahniandDineshMehta,—Fundamentals ofDataStructu In C++ , GalgotiaPublications, 2007.

OtherReferences:

1. http://users.cis.fiu.edu/~weiss/
2. www.youtube.com/watch?v=x3aC8F1X8ao

Course Description

- To develop solutions to given problems using class object concepts.
- To understand the concepts offloading, inheritance and polymorphism
- To learn the basic data structures and its operations.

Prerequisites	Co-requisites
BCS101-Fundamentals of Computing and Programming	Nil

required, elective, or selected elective (as per Table 5-1)

required

Course Outcomes (COs)

CO1: Develop solutions to a given problems using class object concepts.

CO2 : Illustrate overloading, inheritance and polymorphism concepts with example.

CO3 : Explain the basic data structures and its operations

CO4 : Make use of basic data structures to solve problems.

CO5: To develop programs using C++ which forms the basic for advanced programming?

CO6 : Outline various searching and sorting algorithms.

Student Outcomes (SOs) from Criterion 3 covered by this Course

COs/SOs	a	b	c	d	e	f	g	h	i	j	k	L
CO1	M	H				M						
CO2	M			H	M				M			M
CO3	M	M			M							
CO4	L						M					M
CO5	H	H	L	M			M		M	M		M
CO6	M					H						H

List of Topics Covered

UNIT I DATAABSTRACTION&OVERLOADING 9

OverviewofC++–Structures–Class Scope and Accessing Class Members –Reference Variables–Initialization–Constructors–Destructors–MemberFunctionsandClasses– Friend Function – Dynamic Memory Allocation – Static Class Members –Overloading: Function overloading and Operator Overloading.

UNIT II INHERITANCE&POLYMORPHISM 9

Base Classes and Derived Classes–Protected Members–Overriding –Public,Protected and Private Inheritance –Constructors and Destructors in derived Classes–Implicit Derived– Class Object To Base–Class Object Conversion–Virtual functions–This Pointer–Abstract Base Classes and Concrete Classes– Virtual Destructors–Dynamic Binding.

UNIT III LINEARDATASTRUCTURES 9

Abstract Data Types(ADTs)–ListADT–array-base dimplementation– linked list implementation– singly linked lists–Polynomial Manipulation-Stack ADT – Queue ADT

UNIT IV NON-LINEARDATASTRUCTURES 9

Trees–Binary Trees–Binary tree representation and traversals–The Search Tree ADT– Graph and its representations–Graph Traversals–Breadth-first search–Depth-first search– Bi-connectivity**.**

UNIT V SORTINGANDSEARCHING 9

Sorting algorithms: Insertion sort-Quick sort –Merge sort-Searching: Linear search –Binary Search .