5.	**Graphs:** Terminology and Representations, Graphs & Multi-graphs, Directed Graphs, Representation of graphs and their Transversal, Spanning trees, shortest path and Transitive Closure, Activity Networks, Topological Sort and Critical Paths.	7
6.	**File Structure:** File Organization, Indexing & Hashing, Hash Functions, Collision Resolution Techniques.	6
TOTAL		**42**

11. Suggested Books

S.No.	Name of Books / Authors/ Publishers / Year of Publication/ Reprint
Text Books:	
1.	Horowitz and Sahni, "Fundamentals of Data structures", Galgotia publications, 1983
2.	Tannenbaum, "Data Structures", PHI, 2007(Fifth Impression)
3.	An introduction to data structures and application by Jean Paul Tremblay & Pal G. Sorenson (McGraw Hill).
Reference Books	
1.	R.L. Kruse, B.P. Leary, C.L. Tondo, "Data structure and program design in C", PHI, 2009(Fourth Impression)

1. Subject Code**: CO203** Course Title: **Object Oriented Programming**
2. Contact Hours : L: 3 T: 0 P: 2
3. Examination Duration (ETE)(Hrs.) : Theory 3 Hrs Practical 0
4. Relative Weightage : CWS 15 PRS 15 MTE 30 ETE 40 PR 0
5. Credits : 4
6. Semester : III
7. Subject Area : DCC
8. Pre-requisite : NIL

9. Objective : To provide knowledge of Object Oriented programming features.

10. Details of Course

S.No.	Contents	Contact Hours
1.	**Object oriented paradigm & C++ at a glance:** Evolution of programming paradigm, structured versus object-oriented development, elements of object-oriented programming, Objects, classes, methods, popular OOP languages, software reuse. **Classes and objects:** Introduction, Class revisited, constant objects and constructor, static data members with constructors and destructors, constructor overloading, nested classes, objects as arguments, returning objects , friend functions and friend classes, constant parameters and member functions, static data and member functions.	8
2.	**Dynamic objects:** Introduction, pointers to objects, array of objects, pointers to object members, this pointer, self-referential classes **Operator overloading and Inheritance:** overloading of new and delete operators, conversion between objects and basic types, conversion between objects of different classes, overloading with friend functions, abstract classes, inheritance types , virtual base classes, virtual functions, pointer to derived class objects, and base class objects, pure virtual functions, virtual destructors. **Generic programming with templates:** Introduction, function templates, overloaded function templates, class templates, inheritance of class template, class template containership, class template with overloaded operators.	7
3.	Introduction to byte code, security and portability, Data Types, variables, operators, arrays, type conversion and casting, type promotion, Control statements, standard input-output, Designing Classes, constructors, methods, access specifiers : public, private, protected, inheritance, packages and interfaces, Math, String, Vectors, and Array List classes, polymorphism: function and operator overloading, function overriding, abstract classes.	6
4.	**Exception Handling:** exception types, nested try-catch, throw, throws and finally statements, Multithread Programming: thread creation, synchronization and priorities.	6

5.	**Input-output and file operations:** Java.io, stream classes, Byte streams, character streams, serialization. Networking concepts: Client server and socket programming, TCP/IP client and server sockets.	7
6	**Applets and Java Swing:** Applet design, AWT packages, Applet event handling, parameters to applets, AWT controls, layout manager, Frames, container classes, Introduction to Java Beans, Swing and Servlets.	8
TOTAL		**42**

11. Suggested Books

S.No.	Name of Books / Authors/ Publishers / Year of Publication/Reprint
Text Books	
1	Patrick Naughton, Herbert Schildt: "The Complete Reference: Java 2", TMH.ISBN-13 9780070495432
2	C Thomas Wu : "An Introduction to OO programming with Java", TMH,**ISBN**-10: 0073523305
3.	Balaguruswami, "Object oriented with C++", TMH. SBN 0070669074, 9780070669079, 2008
4	Budd, "Object Oriented Programming", Addison Wesley
Reference Books	
1.	Mastering C++ K.R Venugopal Rajkumar, TMH.
2.	C++ Primer, "Lip man and Lajole", Addison Wesley.
3.	Maria litvin, Gary litvin,"Programming in C++", VPH.
4.	D Samantha, "Object oriented Programming in C++ and Java ", PHI.

1. Subject Code: **C0205** Course Title: **DISCRETE STRUCTURES**
2. Contact Hours : L: 3 T: 1 P: 0
3. Examination Duration (ETE) (Hrs.) : Theory 3 Hrs Practical 0
4. Relative Weightage : CWS 25 PRS 0 MTE 25 ETE 50 PR 0