

	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.	
Unit 4	Exception Handling: exception types, nested try-catch, throw, throws and finally statements, Multithread Programming: thread creation, synchronization and priorities.  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	13
Unit 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

#### Books:-

S.No.	Name of Books/Authors/Publisher
1	Patrick Naughton, Herbert Schildt: "The Complete Reference: Java 2", TMH.ISBN-13 9780070495432, 1999
2	C Thomas Wu: "An Introduction to OO programming with Java", TMH, ISBN-10: 0073523305, 2009
3	Balaguruswami, "Object oriented with C++", TMH. ISBN 0070669074, 9780070669079, 2008
4	Budd, "Object Oriented Programming", Addison Wesley, 1997
5	Mastering C++ K.R Venugopal Rajkumar, TMH, 2013
6	C++ Primer, "Lip man and Lajole", Addison Wesley, 1986
7	Maria litvin, Gary litvin, "Programming in C++", VPH, 2001
8	D Samantha, "Object oriented Programming in C++ and Java ", PHI, 2007

Course Title	Course Structure			Pre-Requisite
Operating System	L	T	P	Data Structures
	3	0	2	

**Course Objective:**

To familiarize with the fundamental principles of the operating system, its services and functionalities, the concepts of processes, synchronization and scheduling, memory management and need for protection in computer systems.

**Course Outcome (CO):**

1. Identify the basic concepts and functions of operating systems. Understand differentiation of various operating systems by their functionality.
2. Assess various process synchronization mechanisms and use different CPU scheduling methods in order to allocate resources effectively.
3. Understand various deadlock handling techniques to prevent and/or avoid deadlock.
4. Apply concepts of memory management including Virtual Memory and Page Replacement to the issues that occur in Real time applications.
5. Analyze the concepts related to file system interface, implementation, disk management, protection and security mechanisms

S.No.	Content	Contact Hours
Unit 1	Introduction: Operating system and function, Evolution of operating system, Batch, Interactive, Time Sharing and Real Time System, System protection. Operating System Structure: System Components, System structure, Operating System Services.	4
Unit 2	Concurrent Processes: Process concept, Principle of Concurrency, Producer Consumer Problem, Critical Section problem, Semaphores, Classical problems in Concurrency, Inter Process Communication, Process Generation, Process Scheduling. CPU Scheduling: Scheduling Concept, Performance Criteria Scheduling Algorithm, Evolution, Multiprocessor Scheduling.	9
Unit 3	Deadlock: System Model, Deadlock Characterization, Prevention, Avoidance and Detection, Recovery from deadlock combined approach.	8
Unit 4	Memory Management: Base machine, Resident monitor, Multiprogramming with fixed partition, Multiprogramming with variable partition, Multiple base register, Paging, Segmentation, Virtual memory concept, Demand paging, Performance, Paged replaced algorithm, Allocation of frames, Thrashing, Cache memory, Organization, Impact on performance.	9