

**Swami Ramanand Teerth Marathwada University, Nanded**  
**B.Sc Second Year Semester Pattern Information Technology (Optional)**  
**With Effect from 2010-11**

**B.Sc. II Year. Information Technology (Optional)**

Paper No.	Paper Title	Teaching Periods Per Week ( Theory/ Practical)	Marks (University Evaluation)	Marks (Internal Evaluation)	Total Marks	Total Periods	Duration of Examination
<b>Semester-III</b>							
VI	Programming in C++	03 Periods Theory	40	10	50	40	03 Hours
VII	Operating System	03 Periods Theory	40	10	50	40	03 Hours
<b>Semester –IV</b>							
VIII	Computer Network	03 Theory Periods	40	10	50	40	03 Hours
IX	Programming in Java	03 Periods Theory	40	10	50	40	03 Hours
X	Computer Lab-II Annual Practical (Practical on Paper VI and VIII)	01 Practical (03 Periods)	100	-----	100	20 Minimum Practicals	03 Hours
XI	Computer Lab-III Annual Practical (Practical on Paper VII and IX)	01 Practical (03 Periods)	100	-----	100	20 Minimum Practicals	03 Hours
Total Marks					400		

**B.Sc. III semester Information Technology**  
**Paper VI - Programming in C++**

**( Marks 50, Periods 40)**

**1. Introduction and basic concepts of C++**

Basic concepts of OOP's., Benefits and Applications. Structure of C++ program

Keywords, identifiers, Data-types, Operators in C++, Operator precedence and associativity

**2. Branching and Looping Statements**

Simple If statement, If... Else statement, Nested If ... Else statement, The Switch statement, The while statement, The Do-While statement, The For statement

**3. Functions in C++**

Function, Function prototyping, Default arguments, Reference variable, Call by Reference, Return by Reference, Inline function, Function overloading, Friend and Virtual Function.

**4. Class and object**

Specifying a class , Defining Member Function, Nesting of member function, Private Member Function, Memory allocation for objects, Introduction to Constructor and destructor

**6. Operator Overloading and Type Conversion**

Defining Operator Overloading, Unary and Binary Operator Overloading, Rules for Overloading Operator, Type Conversion

**7. Inheritance and Polymorphism**

Defining Derived Class, Type of Inheritance ( Single, Multiple, Multilevel, Hierarchical, Hybrid Inheritance), Polymorphism

**7. Console I/O Operation and Working with File**

Classes for File stream, Unformatted I/O operations, Formatted console I/O operation , Managing Output with manipulators. Classes for file stream operations, Opening and Closing file

**8. Templates and Exception Handling**

Class Template, Class Template with Multiple Parameter, Function Templates, Function Templates with Multiple parameters

**9. Exception Handling**

Basics of Exception Handling, Exception Handling Mechanism, Throwing mechanism, Catching Mechanism, Rethrowing an Exception.

**Reference Books:-**

1. Object-Oriented Programming with C++ -E-Balgurusamy
2. The C++ Complete Reference -TMH Publication
3. Let us C++ -Yashwant kanetkar

**Paper VII - Operating System**

**Marks: 50, Period: 40**

**1. Introduction to Operating system**

Operating system, Evolution of Operating System, Types of, Operating System. Function of Operating System – I/O management, Device Management, File management, Memory Management, Single user, Single,tasking operating system, Single user multi tasking operating system multi user multi tasking operating system.

**2) Process Management:** Basic Concepts, Process Life cycle, and scheduling.

**3) Memory Management:** Introduction, Process Loading, Logical Versus Physical address space, Swapping memory allocation methods, Virtual paged memory (Mechanics of Virtual Memory) Protection and sharing- Limit registers, paging system segmentation.

**4) Input Output Management:** Organization of I/O Software and Hardware, objectives of I/O System, Structure of I/O System.

**5) File Management:** General Principles-File types, file identification,Directories, paths and paths name, Alias File names, volume concept, file management techniques- Allocation of file space, improving performance of disk system.

**6) Concurrent Process:** Basic Principles, deadlock-deadlocks examples, conditions for deadlocks, dealing with deadlocks, deadlock prevents, Avoidance and detection, inter process communication.

**7) Security:** Authentication, Program Threats, System Threats, Encryption.

**8) Various Operating System:** DOS and Its features, Unix Operating System features-concept of kernel and shell programming, windows. (6)

**Books Recommended –**

1. Operating Systems – Colin Ritchie.
2. Operating Systems Concepts – Godbole.
3. Operating System – J.P.Hays.

## **B.Sc. IV Semester Information Technology**

### **Paper VIII Computer network ( 50 marks Periods 40 )**

#### **1. Introduction to Computer Networks**

Goals of computer Networks, LAN, MAN, WAN., Introduction to Wireless Networks. Network Software-Protocol Hierarchy, Design and Issues for Layer, Synchronous and asynchronous transmission, Network Topologies- Bus, Ring, Star, Tree and other Topologies. Networking Devices – Repeaters, Bridges, Routers, Gateways, Hub and Switch.

#### **2. Network Standards and Network protocols**

Reference Models: OSI reference model, TCP/IP reference model. Different Protocols: -- IP protocol, SMTP, PPP, FTP, HTTP, SNMP. IP-addresses, Domain Name System.

#### **3. Connection, Interfacing and Devices**

Connection oriented and connectionless services, Serial and Parallel connections. Half duplex and full duplex communication. Connectors - D and RJ-45

#### **4. Multiplexing and Switching**

Concept of modulation and their application., Multiplexing – Time division and Frequency division, Switching - Circuit Switching, Packet Switching, Message Switching.

#### **5. Internet and Network Security**

Internet verses Intranet, Internet Service Providers, E-mail – Architecture and Services. Introduction to cryptography, Two Fundamentals Cryptographic principals.

#### **Ref. Books:**

1. Computer Networks By Andrew S. Tanenbaum (Prentice Hall India) Fourth Edition

### **Paper IX Java Programming ( Marks : 50. Periods: 40)**

#### **1.Introduction of Java**

Java history, Java features, How Java Differs from C & C++, Java & Internet, Java Environment, Java virtual machine, Constant, Variables, Data types, Scope of Variable, Branching – if, if...else, Nested if...Else, Switch Statement,Looping – while, do while, for Statement

#### **2. Classes, Objects & Methods**

Introduction, Defining a Class, Field, Method Declaration, Creating Objects, Constructors, Method Overloading, Static Members, Method overriding, Final Variables & methods, Final classes, Finalizer Methods,

### **3. Arrays, Strings and Vectors .**

Introduction to Arrays, Strings, Vectors

### **4. Exception Handling**

Types of Errors, Exceptions, Multiple Catch Statements, Using Finally Statement, Throwing Our Own Exceptions,

### **5 Packages & Interfaces-Multiple Inheritance .**

Introduction of Package, Java API Packages, Using System Packages, Creating Packages, Accessing a Packages, Using a Package, Defining Interfaces, Extending Interfaces, Implementing Interfaces,

### **6. Multithreaded Programming**

Introduction, Creating Threads, Extending the Thread Class, Stopping & Blocking a Thread Life Cycle of Thread, Thread Priorities, Synchronization,

### **7. APPLET Programming .**

Introduction, How Applet differ from Applications, Preparing to Write Applets, Building Applet Code, Applet Life Cycle, Applet Tag, Passing parameters to Applets,

### **Reference Books**

1. Programming With JAVA A Primer. Balagurusamy 3rd Edition  
TATA McGraw HILL
2. The Complete Reference JAVA 2. H. Schlidt.
3. Mastering JAVA 2 J2SE 1.4 John Zukowski BPB Publication.

**Paper X Computer Lab-II Parcatical Based on Paper VI and VIII (Marks 100)**

**Minimum 20 Practical's**

**Paper XI Computer Lab-III Parcatical Based on Paper VII and IX ( Marks 100)**

**Minimum 20 Practical's**

**Prof Dr. S.B Thorat**

**Dean , Faculty of Computer Studies.**

**Prof. S.B. Jagtap**

**Chairman, BOS in Computer Science.**

**Dr. H. S. Fadewar**

**Member, BOS in Computer Science.**