## OBJECT ORIENTED PROGRAMMING WITH C++

### UNIT I

**Principles of Object-oriented Programming**: Software Evolution – A look at Procedure-Oriented Programming – Object-Oriented Programming Paradigm – Basic concepts of object-Oriented Programming – Benefits of OOP – Object-Oriented Languages- Applications of OOP

**Beginning with C++ :** What is C++? – Applications of C++ - A simple C++ Program – More C++ statements – An example with Class- Structure of C++ Program – Reference Variables – Operators in C++ - Scope Resolution Operator – Member De referencing Operators – Memory Management Operators – Manipulators – Type Cast Operators

### UNIT II

**Functions in C++:** Introduction – The Main Function – Function prototyping – Call by Reference – Return by reference – Inline Functions - Default Arguments – const Arguments – Function Overloading – Math Library Functions

**Classes and Objects:** Introduction - C Structure Revisited – Specifying a Class – Defining Member Function-A C++ Program with Class -Making an outside Function Inline –Nesting of Member Function – Private member functions- Arrays with in a class – Memory allocation for objects – Static Data Members – Static Member Functions, Arrays of objects – Objects as Function arguments – Friendly Functions – Returning Objects - Pointers to Members – Local Classes

### UNIT III

**Constructors and Destructors :** Introduction – Constructors – Parameterized constructors – multiple constructors in a class – Constructors with Default arguments – Dynamic Initialization of Objects- Copy Constructors – Dynamic Constructors – Constructing two dimensional Arrays – Destructors

**Operator Overloading and Type Conversion:**

Introduction – Defining Operator Overloading – Overloading unary operators – Overloading Binary Operators – Overloading binary operators using Friends – Manipulation of strings using operators – Rules for overloading operators – Type conversions

### UNIT IV

**Inheritance :** Extending Classes : Introduction – Defining Derived Classes – Single inheritance – Making a Private Member Inheritable – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance – Hybrid Inheritance – Virtual Base Classes -Abstract Classes – Constructors in Derived Classes – Member Classes –Nesting of Classes

**Unit V**

**Managing Console I/O Operations:** Introduction - C++ Streams – C++ Stream Classes – Unformatted I/O Operations – Formatted Console I/O Operation – Managing output with Manipulators

**Working with Files:** Introduction – Classes for File Stream Operators – Opening and closing a File – Detecting end-of-file _ File Pointers and their Manipulators – Sequential Input and Output Operations – Error Handling during File Operations – Command –Line Arguments.

**TOTAL: 60 HOURS**

**Text Book:**

Object Oriented Programming C++ Third Edition – E Balagurusamy, Tata McGraw-Hill Publishing Company Limited

**Reference Book:**

1. Complete Reference C++ - Herbert Schildt, Fourth Edition, Tata McGraw-Hill Publishing Company Limited
2. Object Oriented Programming with ANSI and Turbo C++ - Ashok N. Kamthane, Pearson Edition
3. C++ How to Program – Deitel, Fifth Edition Prentice Hall of India
4. Programming with C++ - D.Ravichandran, Second Edition , Tata McGraw-Hill Publishing Company Limited

## OBJECT ORIENTED PROGRAMMING C++ PRACTICAL LIST

1. Finding the Volume of any three geometric figures using function Overloading
2. Exchange values between two class objects using friend functions
3. Define a class to represent a bank account
   **Data Members**:
   1. Name of the Depositor      2. Account Name

   3. Type of Account      4. Balance amount in the Bank

   **Member Functions**

   1. To Assign initial values      3. To Deposit an amount
   2. To withdraw an amount      4. To display name and balance
      Write a main Program to test the program

4. Find the minimum of two objects using friend function
5. Using Dynamic Constructors , concatenate two strings
6. Overload unary minus operator to change the sign of given vectors ( 3 elements)
7. Overload Binary + Operator to add two complex numbers
8. Add two vector objects . Use >> and << overloading
9. Process student Mark List using multilevel inheritance
10. Using Hierarchical inheritance process employee details

**MATHEMATICAL FOUNDATION FOR COMPUTER SCIENCE**

**UNIT I**

**Set Theory** : Basic Concepts of Set Theory - Inclusion and Equality of Sets – Power Set – Operations on Sets – Cartesian Products – Relations – Equivalence Relations

**UNIT II**

**Functions:** Definition – Examples – One and Onto Functions – Bijective Functions – Identify Functions - Composition of Functions – Inverse Functions

**Unit III**

**Mathematical Logic :** Statements and Notation – Connectives – Negation, Conjunction, Disjunction – Statement Formulas and Truth Tables – Conditional and Bi conditional – well formed Formulas – Tautology – Equivalence of Formulas – Duality Law – Principle Disjunctive Normal Forms – Principal conjunctive Normal Forms

**Unit IV**

**Graph:** Definition – Examples – Sub graphs – Finite and Infinite Graph – Degree of a Vertex – Isolated and Pendent Vertices – Types of Graphs – Examples

**Unit V**

**Paths and Circuits:** Walk, Path and Circuits – Connected and Disconnected Graphs – Euler Graphs – Operations on Graphs – Trees – Properties of Trees – Rooted and Binary Trees .

**Text Book:**

Mathematical Foundations for Computer Science – Part I - D Glory Ratna Mary, Y.S.Irine Viola, Veda Publications

**Reference Books:**

1. Modern Algebra – Arumugam and Isaac,  SciTech Publications
2. Graph Theory -  Arumugam and Isaac
3. Discrete Mathematics for Computer Science – Hary Haggard, John Schlipf and Sue Whitesides, Thomson  Publications.

                                                         **TOTAL: 45 HOURS**

## Office Automation Lab – II

### MS - ACCESS

1. Mark List creation
2. Salary List Preparation
3. Electricity Bill
Generation
4. Report Generation
5. Creation of Mailing Labels

### MS - POWER POINT

1. Creating a Presentation from Scratch
2. Creating Presentation using Design Template
3. Creating an animated Presentation with sound effect
4. Creating a presentation about your personality

# VISUAL BASIC

## UNIT- I

**Getting started with Visual Basic 6.0:** Introduction to Visual Basic, Visual Basic 6.0 Programming Environment, Working with Forms, Developing an Application, Variables, Data types and Modules, Procedure and Control Structures, Array in Visual Basic, Additional examples.
**Working with Controls:** Introduction, Creating and Using Controls, Working with Control Arrays, Additional examples.

## UNIT- II
**Menus, Mouse Events and Dialog Boxes:** Introduction, Mouse Events, Dialog Boxes, Additional examples.Graphics, MDI and Flex Grid: Introduction, Graphics for Applications, Multiple Document Interface (MDI), using the flex Grid Control, Additional examples.

## UNIT- III
ODBC and Data Access Objects: Evolution of Computer Architecture, Data Options, Additional examples.ODBC Using Data Access Objects and Remote Data objects: Open Database Connectivity (ODBC), Remote Data objects, Additional examples.

## UNIT- IV
Data Environment and Data Report: Introduction, Data Environment Designer, Data Report, Additional examples.
Object Linking and Embedding: Introduction, OLE Fundamentals, Using OLE Container Controls, Using OLE Automation Objects, OLE Drag and Drop, Additional examples.

## UNIT- V
Built – in Active X Controls: Working with Built – In Active X Controls, Additional examples.
Working with Active X Data objects; An Overview of ADO and OLE DB, ADO Object Model, Additional examples.
Files and File System Controls: Introduction, File System Controls, Accessing Files, Interface with Windows, Additional examples.

### Text Book:
Visual Basic 6.0 Programming – Content Development Group – Tata McGraw hill Publishing Company Limited, New Delhi.

### Reference Books:
1. Microsoft Visual Basic 6.0 Professionals, Michael Halvorson – PHI
2. Visual Basic 6 in Record Time by Steve Brown, BPB Publications.
3. Visual Basic 6 from the Ground UP – Gary Cornell - Tata McGraw hill

## VISUAL BASIC

**1.** Design of an Analog Clock.

**2.** Design of a Desktop Calculator.

**3.** Design of a Color Mixer using basic colors.

**4.** Create an application to format text inside a text box.

**5.** Create an application using File controls and use two option buttons to show and hide a picture in the picture box.

**6.** Create an Application to do Matrix Addition using Flex Grid Control.

**7.** Create an Editor with File and Edit menus using Menu Editor Tool.

**8.** Create an MDI application with tile and cascade child forms.

**9.** Create an Application to implement OLE Drag and Drop

**10.** Create a mailing address database in Access and view the records using Data Control

**11.** Create a student database Application using ADO

**12.** Create a student database in Access and prepare a Report using Data Report Control

## RESOURCE MANAGEMENT TECHNIQUES

### UNIT- I
**Linear Programming I:** Introduction – Advantages and disadvantages of LP – Basic characteristics of LP – General linear Programming problem – Algebraic solution of a LP(Simplex Method), Linear Programming II: Duality in LPP – Dual Simplex method.

### UNIT -II
**Assignment Problem:** Introduction – Definition and Mathematical formulation – Methods of solutions – Application area of AP – Comparison between AP and TP – Basic theorems – Hungarian method – Exceptional cases of AP – AP with restrictions – Multiple optimal solution of an AP.

### UNIT -III
**Job sequencing problems:** Introduction, Basic terms and Notations used in Sequencing – Priority sequencing rules – Gantt Chart – Types of Job sequencing problems.
**Network models:** Introduction – Basic features of Network models – Main advantages of Network models – Network models – Minimum spanning tree algorithm – Shortest route problem – Maximum flow and minimum cost flow problems – Travelling salesman problem as a network model – Unifying model: Minimum cost flow network – Linear programming approach to a network model.

### UNIT-IV
**Project management:** Introduction – Basic concepts – Project planning techniques – CPM & PERT techniques – Critical path method –The PERT approach – Expected length of a project - Probability of project completion by due date – cost consideration in project scheduling – similarities and differences in CPM & PERT.

### UNIT -V
**Game theory:** Introduction – Definitions and Terminology – Basic game theory models – Fundamental Principles of game theory – Assumptions underlying game theory – Pure strategies: Games with saddle point – The rules of Dominance – mixed strategies: Games without saddle point – Solution of 2xn and mx2 Games(graphical approach) – Linear programming solutions of Games.
**Inventory control:** Fundamentals of Inventory theory – Basic terminology – Advantages & disadvantages of Inventory – formula for the quantity to order and lead time – EOQ with price-breaks.

Text Book:
*Operations Research Models & Methods – Chandrasekhar Salimath, Bhupender parashar – Universities press 2014.*

Reference Books:
*1. Operations Research – Nita H.Shah , Ravi M. Gor, Hardik Soni – PHI Learning Private Limited, New Delhi, 2009*
*2. Operations Research – P.K.Gupta*
*3. Operations Research - Taha*

## DATA STRUCTURES LAB

1. Write a C++ program to implement sequential search and Binary search in array.

2. Write a C++ program to implement linked list and perform the following operations

      c) Add a node as first node.
      d) Add a node as last node.

3. Write a C++ program to implement linked list and implement the following    Objects.

      c) Delete the first node.
      d) Delete the last node.

4. a. Write a C++ program to implement a stack linear list perform the push and pop
    Operations.

  b. Write a C++ program to implement a queue using circular list and implement
    add and delete operations.

5. Write a C++ program to implement binary tree using Linked and perform the
    following traversal

      d. In order traversal
      e. Pre order traversal
      f. Post order traversal

6. Write a C++ program to implement graph using Adjacency matrix and perform the
    following operations

      a. Depth first search
      b. Breath first search

7. Write a C++ program to implement merge sort.

8. Write a C++ program to implement quick sort.

# INTRODUCTION TO INTERNET WITH HTML

**UNIT- I**
**Introduction to Internet:** Computer is business-networking-internet- e-mail-gopher-world wide web, Internet Technologies – Internet Browsers.

**UNIT- II**
**Introduction to HTML:** History of HTML - HTML generation and Documents – Tags and Links – Head and Body Section.

**UNIT-III**
Designing Body Section – Ordered and Unordered List – Table Handling

**UNIT- IV**
**Introduction to DHTML:** Features of DHTML – Defining styles – Working with Colors – Text and Fonts with Style.

**UNIT- V**
Frames – Frame set Definition – Nested frames – A web design project – forms.

Text Book:
*World Wide Design with HTML by C.XAVIER – TMH Publications.*

Reference Book:
*Fundamental of the internet and the World Wide Web by Greenlaw and Hepp. TMH Publications.*

## MS WORD

### UNIT- I
Introduction to Microsoft Word 2003

### UNIT- II
Creating a document in Microsoft Word 2003

### UNIT -III
Working with tables, Charts and Graphics – MAILMERGE.

### UNIT- IV
Additional Commands of Microsoft Word 2003

### UNIT- V
Menu Commands of Microsoft Word 2003

Text Book:
*Straight to the Point Microsoft Word 2003, Firewall Media*

Reference Books:
*1. Gini Courter & Annette Marquls – Microsoft Office 2000 No Experience required, BPBPublications.*
*2. Stephen L. Nelson - Office 2000: The complete reference, Tata McGraw Hill PublishingCompany Limited.*

## OPERATING SYSTEM

### UNIT- I

**Introduction:** What is an Operating System: Mainframe Systems – Desktop Systems – Multiprocessor Systems - Distributed Systems – Clustered Systems – Real – time Systems – Handheld Systems?

### UNIT- II

**Process:** Process Concept – Process Scheduling – Operations on Process – Co-operating processes – InterProcesses - Inter Process communication.
**CPU Scheduling:** Basic Concepts – Scheduling Criteria - Scheduling algorithms – Multi processor Scheduling - Real time Scheduling – Algorithms evaluation

### UNIT- III

**Process Synchronization:** Background – the critical section problem – Synchronization hardware –Semaphores – Classical problems of Synchronization – critical regions – Monitors – Atomic transactions **Deadlocks:** System model – Deadlock Characterization – methods for handling Deadlocks – Deadlockprevention – Deadlock Avoidance – Deadlock detection – recovery from Deadlock

### UNIT- IV

**Memory management:** Background – Swapping – Contiguous memory allocation – paging – segmentation – segmentation with paging.
**Virtual Memory:** Background – Demand paging – Page replacement – Allocation of frames.

### UNIT -V

**File System Interface:** File concept – Access methods – File system structure – File system implementation – Directories structure - Directory implementation – Allocation methods – Free space management – Efficiency and performance – Recovery.
**Mass Storage Structure:** Disk Structure – Disk Scheduling – Disk management – Swap space management – RAID structure – Disk attachment – Stable Storage.

**Text Book:**
*Operating System Concepts – Abraham Silverschatz and Peter Baer Galvin Addition Wesley publishing company – sixth Edition*

**Reference Books:**
*1. Operating System: Intel and Design Principles – Fifth Edition, William Stallings, PHI*
*2. Understanding Operating System, Ida M.Flynn, Ann Mclver Mchoes*
*3. Operating Systems – Second Edition, Achyut s.Godbole, TMH*

**COMPUTER NETWORKS**

### UNIT-I

Network Hardware: LAN – WAN – MAN – Wireless – Home Networks. Network Software: Protocol Hierarchies – Design Issues for the Layers – onnection -oriented and connectionless services – Service Primitives – The Relationship of services to Protocols. Reference Models: OSI Reference Model – TCP/IP reference Model – Comparison of OSI andTCP/IP -Critique of OSI and protocols – Critique of the TCP/IP Reference model.

### UNIT-II

Physical Layer - Guided Transmission Media: Magnetic Media – Twisted Pair – Coaxial Cable Fiber Optics. Wireless Transmission: Electromagnetic Spectrum –Radio Transmission – Microwave Transmission – Infrared and Millimeter Waves – Light Waves. Communication Satellites: Geostationary, Medium-Earth Orbit, Low Earth-orbit Satellites – Satellites versus Fiber.

### UNIT-III

Data-Link Layer: Error Detection and correction – Elementary Data- link Protocols – Sliding Window Protocols. Medium-Access Control SUB LAYER:Multiple Access Protocols – Ethernet – Wireless LANs – Broadband Wireless – Bluetooth.

### UNIT-IV

Network Layer: Routing algorithms – Congestion Control Algorithms. Transport Layer: Elements of Transport Protocols – Internet Transport Protocols: TCP.

### UNIT-V

Application Layer: DNS – E-mail. Network Security: Cryptography – Symmetric Key Algorithms – Public Key Algorithms – Digital Signatures.

**Textbooks:**
Computer Networks – Andrew S. Tanenbaum, 4th edition, PHI.(UNIT-

**Reference Books:**
1. Computer Networks –Bhushan Trivedi, Oxford University Press.
2. Data Communication And Networks – Achyut Godbole, 2007, TMH.
3. Computer Networks Protocols, Standards, and Interfaces – Uyless Black, 2$^{nd}$ ed,PHI.

## COMPUTER GRAPHICS AND MULTIMEDIA

### UNIT- I

**Introduction:** Application and Operations of Computer Graphics - Graphics Packages – Requirements ofa Graphical System – GUI

**Input Output Devices:** Common Input Devices – Graphical output Devices – Raster Scan Video Principle -Raster Scan CRT Monitors – Color Raster Scan System – Plasma Display – LCD – Hard copy Raster Devices

- Raster Scan System – Memory Tube Displays – Plotters – Graphics Accelerators – Coprocessors

### UNIT- II

Scan Conversion – Methods – Polynomical Method – DDA algorithms for line drawing Algorithm, Circle, Ellipse, Parabola – Bresenham's Line Drawing Algorithm - Bresenham's Circle Drawing Algorithm – Problem of Dcan Conversion – Solid Areas – Odd Even Methods – Winding Number Method - Solid Area Filling – Algorithms – Boundary, Flood Fill Algorithm

### UNIT-III

Two Dimension Transformations – Translation – Scaling – Rotation – Transformations of Points and Objects – Homogenous Coordinate System and Transformations – Reflection – Shearing – Three Dimension Transformations - Translation – Scaling – Rotation – Reflection – Shearing

### UNIT- IV

2D Viewing and Clipping – Windows and View Ports – Viewing Transformations – Clipping of lines in 2D – Cohen Sutherland Clipping Algorithms – Visibility – Midpoint subdivision method – parametric Clipping – Polygon Clipping – Sutherland Hodgeman Algorithm – Clipping against Concave windows – Hidden Surface Elimination – Black Face Removable Algorithm Z buffer Algorithm

### UNIT- V

Concept of Multimedia – types, Data Steams – Applications – Authoring digital Audio – MIDI – Image Compression – Video Compression – Graphic File Formals – BMP – GIF – JPEG- TIFF – PNG

**Text Book:**
*Computer Graphics Multimedia and Animation – Malay K.Pakira – PHI Learning 2008*

**Reference Books:**
*1. Computer Graphics – Apurva Desai – PHI – 2008*
*2. Prabhat Andleigh, Kiran Thakrar – Multimedia system and Design – Prentice Hall 2000*

**SOFTWARE PROJECT MANAGEMENT**

### UNIT- I

Conventional Software Management – Waterfall Model - Conventional Software Management Performance – Evolution of Software economics - Software economics – Pragmatic software cost estimation – Improving software economics – Reducing software product size – Improving software process – Team effectiveness – Automation through software environments.

### UNIT- II

Lift cycle phases – Engineering and Production stages – Inception, Elaboration, Construction and Transition Phases – Artifacts of the process – The artifact sets – Management, Engineering and Pragmatic artifacts – Model based software Architectures.

### UNIT -III

Workflows of the process – Software process Workflows – Iteration Workflows - – Iterative process planning – work breakdown structures – Planning guidelines – cost & schedule estimation process – iteration planning process – pragmatic planning – Project Organizations & responsibilities.

### UNIT- IV

Process automation – Tools – The project environment – Project control and Process Instrumentation – The seven core metrics – Management indicators – Quality indicators – Life cycle expectations – Pragmatic software metrics – Metrics automation –Tailoring the Process – Process discriminates.

### UNIT-V

Modern Project Profile – Continuous Integration – Early risk resolution – Evolutionary requirements – software management Principles Next generation software economics – Modern Process transitions.

**Text Books:**

*1. Software Project Management – Walker Royce – Pearson Education 2012*
*2. Software Project Management, Bob Hughes and Mike Cotterell- Tata McGraw Hill, 2011.*
*3. Software Project Management in practice, Pankaj Jalote, Pearson Education 2012*