

**JANATA SHIKSHAN PRASARAK MANDAL'S  
PHULSINGNAIKMAHA VIDYALAYA, PUSAD.**

**SYLLABUS**

**for**

**BACHELOR OF VOCATION (B.VOC)**

**in**

**SOFTWARE DEVELOPMENT**

**SEMESTER – I to VI**

**2020- 21**

**SUBJECT CODE: 1BVCSD3 & 1BVCSD8**

**COMPUTER FUNDAMENTALS**

**NSQF Level - 5**

**QP Code – SSC/Q0101**

**AIM:**

- Give a general understanding of how a computer works
- Introduce to various components of Computers, networks types and operating systems.
- Prepare the candidates for future courses.

**OBJECTIVES:**

At the end of the course the students will be able:

- Describe the various components of computers
- Understand various storage devices,
- Understand computer networks and types
- Understand operating systems and its features

**UNIT- I:**

**Components of Digital Computers:** Block diagram, **Types:** Digital, Hybrid, **Bus:** Data, control and Address Bus.

**Numbers system:** Binary, Octal Decimal, Hexadecimal their conversion, binary arithmetic ASCII, BCD, EBCDIC.

**Generation of Languages:** Machine, Assembly High Level Languages.

**Translators:** Compiler, Interpreter and Assembler, source and object program.

**UNIT: II**

**Memory:** Static & Dynamic, RAM ROM, PROM EPROM, flash and cache.

**Storage Devices:** Hard Disk, Zip Disk and Optical Disk pen Drive BluRay

**Input Devices:** Light Pen, Touch screen, voice input, MICR OCR OMR Barcode Reader and Flatbed Scanner.

**Output Devices:** VDU Printers: Dot Matrix, Inkjet and laser printers

**Plotters:** Drum, Flat Bed and Inkjet.

### **UNIT- III:**

**Network:** Network terminology, topologies: Linear, Circular, Tree and Mesh

**Types of Networks:** LAN MAN, WAN Repeaters, Bridge, Routers, Routers and Gateway. Modem, for communication between pc's, **Wi-Fi-network:** Introduction of Bluetooth and Infrared devices.

**Network protocols & Architecture:** peer-to peer, client/Server.

### **UNIT- IV:**

**Operating System:** Introduction to OS, Functions and classification DOS: Warm booting and cold booting, Types of commands command format, Directory, file management and general commands file naming conversation DOS editor, batch file.

**Windows OS:** Introduction features. **Modules:** Program Files and Print Manager, Control panel Icon Switching between Applications Help & Recycle bin **Windows Accessories:** Note pad, Paint and Calculator.

### **Reference Books:**

1. Information Technology concept by Dr. Madhulika Jain Shashank&satish Jain (BPB publication New Delhi)
2. Fundamentals of Information Technology by Alexis and Mathews Leon ( Leon Press, Chennai &vikas publishing House Pvt. LT. New Delhi)
3. Computers Fundamentals by P.K. Sinha.

**SUBJECT CODE: IBVCSD8**

**PRACTICAL: Practicals based on the syllabus of Computer fundamentals.**

**SUBJECT CODE : 1BVCSD4 & 1BVCSD9**

**PROGRAMMING IN C**

**NSQF Level - 5**

**QP Code – SSC/Q0101**

**AIM:**

- To fully cover the basics of programming in the “C” programming language.
- Demonstrate fundamental programming techniques.

**OBJECTIVES:**

- To familiarize the students with basic concepts of computer programming and developer tools.
- To present the syntax and semantics of the “C” language as well as data types offered by language.
- To allow the students to write their own programs using standard language infrastructure.

**UNIT- I:**

**Programming Structure:** sequence, Selection Iteration and Modular, problems solving techniques,

**Development Tools:** Algorithm, flowcharts and pseudo code (definition and characteristics)  
Developing Algorithm and drawing Flowchart.

**UNIT –II:**

C character set, Token Identifier, Keyword, Variables, DATA Types, Operators and Expressions, Constant character string Enumerated Data types Operator Precedence and Associativity, Library functions control structure.

**UNIT –III:**

**Array:** Single and Two Dimensional Arrays.

**Strings:** strings Manipulation, array of String

**Function:** Function components, parameter passing default arguments, Recursive functions array with function storage classes

**UNIT –IV:**

**Structure:** Declaration, Accessing structure members, initialization Nesting of structures **Union:** Union difference between structure and union **Pointer:** Introduction address Operator (&) Pointer variables void pointers arithmetic, Pointers to pointers. **File Handling:** Hierarchy of File stream classes opening & closing file modes file pointers their Manipulations, Sequential Access, Random Access, Command line argument.

**Reference Books:**

1. The Art of programming through Flowchart & algorithm by Anil B Chaudhari  
Firewall Media, Laxmi publication, New Publication
2. Programming in C by E. Balgurusami TMH Publications
3. C Programming – Kernighan and Ritchie
4. Let us C – Y. Kanetkar
5. C Programming – Holzner, PHI Publication
6. Programming in C-- Ravichandran

**Subject Code: 1BVCSD9****PRACTICAL: Practicals based on the syllabus of programming in C**

<p><b>SUBJECT CODE: 1BVCSD5 &amp; 1BVCSD10</b> <b>SWITCHING THEORY &amp; LOGIC DESIGN</b> NSQF Level - 5 QP Code – SSC/Q0101</p>
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**AIM:**

The aim of this subject is to facilitate the student with the knowledge of Logical Systems and Circuits, thereby enabling the student to obtain the platform for studying Digital Systems and Computer Architecture.

**OBJECTIVES:**

- To familiarize students with different number systems, digital logic, simplification and minimization of Boolean functions.
- To design combinational & sequential digital circuits and state machines.
- To introduce programmable logic devices.
- The students will be able to design optimized logic circuits through combinational and sequential logic.

**UNIT I:** Boolean algebra, De Morgan's theorem, SOP & POS forms of logic functions, simplification techniques using K-map, Queen McCusky method.

**UNIT II:** Combinational logic design procedure, design of code converter, decoders, encoders, multiplexer, binary adders, subtractor & parity generator using logic gates and above combinational circuits. Analysis & synthesis of sequential circuits, design of shift registers, design of synchronous & asynchronous counters. VHDL representation of multiplexer, encoder and decoder.

**UNIT III:** VHDL Modeling Concepts, VHDL **Fundamentals:** Constants, Variables, Scalar types, Type Classification, Expression, Operators, Sequential Statements, If, Case, Null, Loop, Assertion, Report statements.

**UNIT IV:** Array & VHDL, Unconstrained array types, Array operations & referencing, Records Basic Modeling **constructs:** Entity declarations, Architecture bodies, Behavioral descriptions, Structural descriptions, Design processing. **Subprograms:** Procedures, Procedure parameters, Descriptions, Design processing, Concurrent Procedure calls, Functions, Overloading, Visibility, Package declaration, Package bodies, Use Clause, Basic Resolved Signals & Ports, Generic constants.

**REFERENCES:**

1. A. Anand Kumar, “ Switching Theory and logic Design” PHI
2. Moris Mano & C.R. Kime. “Logic and computer Design Fundamentals”, 2<sup>nd</sup>Edn, Pearson Education.
3. J. Bhaskar, “VHDL Primer, “Person Education.
4. Perry “ VHDL’’, Tata McGraw Hill
5. J.F. Wakerly, “Digital Logic Design, PHI
6. V.P. Nelson Et al, Digital Logic Circuits, Analysis & Design,PHI.
7. Peter J. Ashenden, ‘ The Designer’s Guide to VHDL’’, 2<sup>nd</sup> End, Harcourt Asia.

**SUBJECT CODE: 1BVCSD10****PRACTICAL: Practical based on the syllabus of Switching Theory & Logic Design****Subject Code : 1BVCSD11****Field Work / Industrial Visit****NSQF Level - 5****QP Code – SSC/Q0101**

Visit to any IT industries/ workshop/ College/University/technical expo/national and international exhibitions.

Report writing based on the above work.

Assessment done on the basis of viva voce and report by the teaching faculty.

**SUBJECT CODE: 2BVCSD3 & 2BVCSD8  
OPERATING SYSTEM**

**NSQF Level - 5  
QP Code – SSC/Q0101**

**AIM:**

To provide a clear understanding of the concepts that underlies operating systems

**OBJECTIVES:**

- The students will be:
- Gain extensive knowledge on principles and modules of operating systems
- Understand key mechanisms in design of operating systems modules
- Understand process management memory management deadlocks

**UNIT- I:**

**Operating System function:** Introduction services of operating system, use of system call, operating system structure, Introduction to the file system, Device Drivers, Terminal I/O

**UNIT- II:**

**Process management:** Introduction, context switching, Process States, Process Control Block (PCB), operations on process, Process scheduling, **Deadlock:** deadlock prerequisite, Deadlock strategies.

**UNIT- III:**

**Memory Management:** Introduction to Single contiguous memory management, Fixed Partitioned Memory Management, Variable Partitioned Memory Management, Logical vs. Physical address Space, Memory Management Requirement, Non Contiguous Allocation, Paging, segmentation

**UNIT –IV**

**Linux Case Study:** Introduction, Process Management, Process Scheduling, Memory Management, file Management, Devices Drivers.

**Text Books:**

Operating Systems. A.S. Godbole (TMH)

**Reference Books:**

1. Operating Systems. By P.Balkrishna Prasa.(Scitech Publication)
2. Operating System Concepts Slibershaz (Addission Education)
3. Operating Systems H. M. Deitel (Addittion Wesley)
4. Operating System John J. Donoven.
5. Operating System A.S. Godbole (TMH)
6. LINUX complete Reference by Richard Peterson

**SUBJECT CODE: 2BVCSD8****PRACTICAL: Practical based on the syllabus of Operating System**

**SUBJECT CODE: 2BVCSD4 & 2BVCSD9**  
**OBJECT ORIENTED PROGRAMMING USNIG C++**

**NSQF Level - 5**  
**QP Code – SSC/Q0101**

**AIM:**

To present the concept of object oriented programming and discuss the important elements of C++.

**OBJECTIVES:**

- Understanding the concepts of object oriented programming.
- Write simple application using C++.

**UNIT I:**

**Elements of object oriented programming:** objects, classes, OOPs features, **Classes and Objects:** Specifying a classes creating objects, Accessing class members, Defining member function, outside members, function as in line Accessing Members, function within the class statics data members, **Access specifics:** Private protected and public Members

**UNIT II:**

**Constructors & Destructors:** Introduction to parameterized constructors, overloading constructors with Default Arguments, copy constructor, destructor, order of construction and destruction, static data member with constructor and destructors, **Operator Overloading:** definition, overloadable operators, unary operator overloading unary and Binary overloading Rules for operators overloading.

**UNIT III:**

**Dynamic Objects:** Pointers to objects creation & deletion, dynamic objects, new and delete operators, array of objects, array of pointers, pointers to objects, this pointers.

**Inheritance:** definition, Abstract classes, single, multilevel, multiple, hierarchical & Hybrid inheritance.

## **UNIT IV:**

**Virtual Functions:** Need of virtual functions, definition, pure virtual functions, Abstract Classes, Rules of virtual function, **Exception Handling:** Exception handling, Model List of exceptions Handling, Uncaught Exceptions, Fault Tolerant, Design Techniques, Memory Allocation, failure exception, Rules for handling exception successfully.

Reference Books.

1. Mastering C++ by K.R. Venugopal Tata MCGraw –Hill New Delhi.
2. The C++ programming language –Bjarne Stroustrup
3. Programming with C++ Ravichandran
4. Programming With C++ Robert Lafor
5. Object Oriented programming with C++ E.Balgurusami, McGrawHill

**Subject Code: 2BVCSD9**

**PRACTICAL: Practical's based on the syllabus of Object Oriented Programming Using C++**

**SUBJECT CODE 2BVCSD5 & 2BVCSD10**

**SYSTEM ANALYSIS & DESIGNING**

**NSQF Level - 5**

**QP Code – SSC/Q0101**

**AIMS:**

- To provide an understanding of the role of systems analysis and design within various systems development lifecycles.
- To develop an awareness of the different approaches that might be taken to system analysis and design
- To understand the activities of the systems analyst and systems designer and apply some current techniques.

**OBJECTIVES:**

On completion of this module the candidate should be able to:

- Describe different lifecycle models and explain the contribution of the systems analysis and design within them.
- Discuss various approaches to systems analysis and design and explain their strengths and weaknesses.
- Evaluate the tools and techniques of systems analysis and design that may be used in a given context.
- Use appropriate methods and techniques to produce an analysis of a given scenario.
- Use appropriate methods and techniques to produce a system design for a given scenario. Provide suitable documentation for systems analysis and design activities.

**UNIT –I:** Introduction, System Types, component of computerized information system, system analyst duties & role in SDLC, data collection methods: Interviews brain Storming Questionnaires documents search observation.

**UNIT II:** Structure tools and techniques of Data Analysis, Decision tables and trees, data flow diagram, data dictionary ,system design, input and output design, designing principals, principals of form design ways to ensure quality forms codes, physical representation of codes, principles of code design

**UNIT – III: Implementation:** Training operational Training and Related Activities Changes strategies, Testing preparation of Testing Level of Testing Test Evaluation Acceptance Conversation Cold Turkey Parallel pilot Modular and sequential Methods, Conversation period Length system Evaluation.

**UNIT-IV:**

Project Planning, Metrics for Project size Estimation, project Estimation Techniques, project monitoring and Control, risk management, Software Configuration Management: Necessity, Configuration Management Activities, software Reliability and quality Management: Software Reliability & Quality, ISO 9000,. Software Maintenance Process Models, Estimation of Maintenance Cost, and Software Reuse: What can be reused, why no reuse so far Basic Issues.

**References Books:**

1. Information system analysis, design & Implementation By KM Hussain Donna Hussain[Tata McGro-Hill]
2. Fundamentals of software Engineering by Rajib Mall[PHI Publication ]
3. System Analysis and design – Edward-TMH  
Introduction to System Analysis Design, Igor Hawryskiewicz, PHI

**SUBJECT CODE :2BVCS10**

**PRACTICAL : Practicals based on the syllabus of System Analysis & Designing**

**Subject Code : 2BVCS11**

**Field Visit / Industrial Visit**

**NSQF Level - 5**

**QP Code – SSC/Q0101**

Visit to any IT industries/ workshop/ College/University/technical expo/National and International exhibitions.

Report writing based on the above work.

Assessment done on the basis of viva voce and report by the teaching faculty.

## **SEMESTER III**

**Subject Code : 3BVCSD3 & 3BVCSD8**

### **DATA STRUCTURES**

**NSQF LEVEL: 6**

**QP CODE: SSC/Q0509**

**AIM :** To introduce the student to the concept of data structures through abstract data structures including lists, sorted lists, stacks, queues etc.

#### **OBJECTIVES:**

- Be familiar with basic techniques of algorithm analysis.
- Be familiar with writing recursive methods.
- Master the implementation of linked data structures such as linked lists & binary trees.
- Be familiar with advanced data structures such as balanced search trees, hash tables, priority queues, and the disjoint set union/ find data structures.
- Be familiar with several sub-quadratic sorting algorithms including quick sort, merge sort and heap sort.
- Be familiar with some graph algorithms such as shortest path and minimum spanning tree.

**UNIT-I: LINKED LIST :** Linked list, Representation of single, Double Header, Circular signal and Double Linked List, All possible operations on signal and double Linked list using dynamic representation, polynomial representation and its manipulation.

**UNIT-II: STACK :** Stack terminology, Representation of stack in memory, Operations on stack, Polish notations, Translation of Infix to postfix & prefix expression, Infix to postfix conversion, Evaluation of postfix expression, Recursion, Problems on recursion, Quick sort and Tower of Hanoi problem.

**UNIT-III: QUEUE:** Representation of queue in memory, Circular queue, Dequeue and priority queue, Operations of above structure using array and linked representation.

**Sorting and searching :** Selection sort, insertion sort, Merge sort, Efficiency of sorting method, Hash tables, Hashing technique, Collision resolution technique,

**UNIT-IV: TREES:** Basic terminology, Representation of binary tree in memory, Traversing of binary tree, Binary search tree, Heap tree, Heap sort method, **Graph:** Basic terminology, Definition and representation of graph in memory, Linked list and matrix representation, **Traversing graphs:** BSF, DFS method.

**Reference Books:**

1. Data structures Using C++ : Y Kanetkar
2. Data structures Using C++ : Tennenbaum
3. Data structures By Tremblay Sorenson
4. Data Structure By Bhagat Sing Naps.

**PRACTICAL : Practicals Based on syllabus of Data Structure.**

**Subject Code : 3BVCSD4 & 3BVCSD9**  
**DATABASE MANAGEMENT SYSTEM**

**NSQF LEVEL: 6**

**QP CODE: SSC/Q0509**

**AIM:**

To provide students with an understanding of the current theory and practice of database management system. These include data independence, integrity, security, database design, principles and database administration.

**OBJECTIVES:**

- Understand basic database concepts, including the structure and operation of the relational data model.
- Construct **simple** and moderately advanced database queries using Structured Query Language (SQL).
- Understand and successfully apply logical database design principles, including E-R Diagrams and database normalization.
- Understand the concept of database transaction and related database facilities including concurrency control, Journaling, backup and recovery.
- Understand the role database administrator.

**UNIT-I:** Database System Application, Database system versus File systems, view of data, Data models, Database management system, **Database Administration:** Role functions and responsibilities of DBMS.

**UNIT-II: SQL:** Basic structure, Set operations, Aggregate functions, Views, Types **of SQL Commands:** DDL, DML, DCL, Entity Relationship model, Basic concepts, constraints, keys, and Weak entity sets, Entity Relationship Diagram, Transforming E-R diagram into relation, RDBMS.

**UNIT-III:** Integrity and Security, Domain constraints, Referential integrity, Assertions, Authorization in SQL, **Normalization:** Normal forms first, second, third, BCNF.

**UNIT-IV:** Transaction Management, Transaction concept, Transaction state, Concurrent Execution, Concurrency control, lock based protocol, Deadlock handling, Recovery system.

**TEXT BOOKS:** “Database System Concept” Silberschatz, Korth, Sudershan

Mc Graw Hill, 3<sup>rd</sup> Edition.

**REFERENCE BOOKS:**

1. “Database Management Systems”, Raghu Ramkrishnan, Mc Graw Hill
2. “Database Management Systems”, G K Gupta, McGraw Hill.
3. “Database Systems Implementation”, Garcia-Molina, Ullman Widom, Pearson education
4. “An Introduction of Database System”, Bipin C. Desai, Galgotia Publication.

**PRACTICAL: Practicals based on syllabus of Database Management System**

**Subject Code : 3BVCSD5 & 3BVCSD10**  
**FILE STRUCTURE & DATA PROCESSING**  
NSQF LEVEL: 6  
QP CODE: SSC/Q0509

**AIM:** To introduce the structural representation of data items in primary and secondary memory to do storage & retrieval operations efficiently.

**OBJECTIVES:** The students will be familiar with:

- The file processing operations, organization
- Data compression & representation

**UNIT-I: Introduction:** File structure design, **File processing operations:** Open, Close, Read, Write, and Seek. UNIX directory structure, **Secondary storage devices:** Disks, Tapes, CD-ROM, Buffer management, I/O in UNIX.

**UNIT-II: File structure concepts:** Field & record organization, using classes to manipulate buffers, Record access, and Record structures, File access & file organization, Abstract data models for file access, Metadata, Extensibility, Portability & standardization.

**UNIT-III:** Data compression, Reclaiming spaces in files, Introduction to internal sorting and binary searching, Key sorting, Indexing concepts. Object I/O, Multiple keys indexing, Inverted lists, Selective indexes, binding. Consequential processing: Object-Oriented model, its application. Internal sorting: a second look. **File merging:** Sorting of large files on disks, Sorting files on tapes. Sort-merge packages, Sorting & consequential processing in UNIX.

**UNIT-IV: Multilevel indexing:** Indexing using Binary search trees, OOP based B-trees. B-tree methods search, Insert and others. Deletion, Merging & redistribution, B\*trees, Virtual B-tree. VL records & keys. Indexed sequential file access and Prefix B+ trees, **Hashing:** Introduction, a simple hashing algorithm, hashing functions and record distributions.

**Reference Books:**

- 1 File Structures: An Object-Oriented Approach Using C++, Michael J. Folk, Bill Zoellick, Greg Riccard, (Addison-Wesley)(LPE)
- 2 Data Management & File Processing M. Loomis (PHI)
- 3 Design of Computer Data files, O. Hanson, Mc Graw Hill (IE)

**PRACTICAL: Practicals based on syllabus of File Structure & Data Processing**

**Subject Code: 3BVCSD11**

**Field Visit / Industrial Visit**

**NSQF Level - 5**  
**QP Code – SSC/Q0101**

Visit to any IT industries/ workshop/ College/University/technical expo/National and International exhibitions.

Report writing based on the above work.

Assessment on the basis of viva-voce and report by the teaching faculty

**SEMESTER IV**

**Subject Code: 4BVCSD3 & 4BVCSD8**

**SOFTWARE ENGINEERING**

**NSQF LEVEL: 6**

**QP CODE: SSC/Q0509**

## AIM:

In this course, student will gain understanding of the discipline of software engineering and its application to the development of and management of software systems.

## OBJECTIVES:

- To gain the knowledge of basic software engineering methods and practices, and their appropriate application.
- A general understanding of software process models, planning
- An understanding of the role of project management including planning, scheduling, risk management, etc.
- An understanding of software requirements
- An understanding of software testing.

**UNIT-I: SOFTWARE :** Software Characteristics, Components & Applications, Software Engineering - A Layered Technology, Software Process Models - Linear Sequential Model, Prototype & Rad Model., Evolutionary Software Process Model – Incremental Model and Spiral Model. **SOFTWARE PROJECT MANAGEMENT:** Project Management Concepts – People Problem and Process S/W process and Project Metrics: Metrics in The Process and Project Domains. Software Measurement –Size Oriented, Function Oriented Metrics, Extended Function

**UNIT-II:** Measures, Metrics & Indicator, Metrics in process & project domains-software measurement, Metrics for software quality, small organization. Software projects planning scope, resources, estimation, decomposition technique, Tools, **Software risks:** Identification, Risk projection, re-finenment & RMMM plan.

**UNIT-III:** Software architecture, Data design, Architectural styles, Requirement mapping, Transform & Transaction mapping, User interface design, Golden Rule, UTD, Task analysis & modeling, ID activities, Tools, design evaluation, Component level design, Structure programming, Comparison of design notation.

**UNIT-IV: Software testing fundamentals:** Test case design, White box testing, Black box testing, basic path testing, and control structure, Strategic approach to software Testing, Unit Testing, Integration Testing, Validation Testing, System Testing, Debugging.

## TEXT BOOK:

Pressman Roger. S: Software Engineering, A Practitioner's Approach, TMH

## REFERENCE BOOKS:

- 1 Software Engineering by Somerville (Addison-Wesley) (5e)
- 2 Software Engineering by Fairly R (Mc Graw Hill)

- 3 Principles of Software Development, Davis A (Mc Graw Hill)
- 4 Software Engineering, Shooman, M.L. (Mc Graw Hill)

**PRACTICAL: Practicals based on syllabus of Software Engineering**

**Subject Code: 4BVCSD4 & 4BVCSD9**

**WEB DESIGNING**

**NSQF LEVEL: 6**

**QP CODE: SSC/Q0509**

**AIM:**

This course is intended to provide students with an understanding of the designing web site using HTML, XML and CSS.

**OBJECTIVES:**

- To understand the importance of the web as a medium of communication.
- To understand the principles of creating an effective web page, including an in-depth consideration of information architecture.
- To become familiar with graphic design principles that relate to web design and learn how to implement these theories into practice.
- To develop skill in analyzing the usability of a web site.
- To learn the language of the web: HTML & CSS.

**UNIT-I :** Introduction to Internet, History of Internet, Internet users, Internet working, Information on Internet, Requirement for connecting to Internet, basic Internet terms, Introduction to world wide web, Evaluation of world wide web, basic features, web browsers, popular web browser, web servers, HTTP, URL, Search engines, categories, how to use search engines, searching criterion.

**UNIT-II : HTML :** Introduction, Objectives, HTML Browser, Windows switching, HTML command tags, URLs, Links, New web page creation, main body of the text, putting headers, Adding paragraph, Formating Text, in HTML& Font mechanism, color setting, superscripts & subscripts & other manipulation on text and paragraph, using directory and menu list, Creation of links inserting graphics, Using image, All manipulation on tables & its display, Detail working with forms, allowing visitors to upload files, Active image, Working with frame & framesets, Frame handling, Scroll Bars, alternative to frames.

**UNIT-III: Cascading Style Sheet:** Introduction to CSS, Creating style sheet, Common task with CSS, Colors, the font family, font matrices, Length units, absolute units, relative units, the pixel units, percentage of value, keywords as values, Various properties such as the font size property, font size property etc, assigning classes, tax and attributes for applying classes, applying classes to an HTML tags, applying classes to other document parts, the layer tags, CSS tags.

**UNIT-IV:** XML: Introduction, XML tree, XML syntax, XML elements, XML attributes, XML DTD.

**REFERENCE BOOKS:**

1. Internet and web design By R Bangia, Second Edition, firewall media
2. Multimedia and web technology By R Bagia, Khanna Book Publishing Company; Third edition
3. Internet and web designing By ITEL(macmilian)
4. Programming the world wide web By Robart W. Sebesta (Pearson)
5. Web technology theory & Practice By M. Srinivasan, (Pearson Publication)

**PRACTICAL: Practicals based on syllabus of Web Designing**

**Subject Code: 4BVCSD5 & 4BVCSD10**

## **JAVA PROGRAMMING**

**NSQF LEVEL: 6**

**QP CODE: SSC/Q0509**

### **AIM:**

To introduce students to programming concepts and techniques using the Java language in a way appropriate for students without programming background.

### **OBJECTIVES:**

- To learn the basic syntax and semantics of the Java language and programming environment.
- To understand the concepts of classes and objects.
- To understand the primitive data types built into the Java language and the difference between variables of primitive types and variables of class types.
- To understand features of a strongly typed language: variable declaration and type compatibility checking.

**UNIT-I : Introduction to Object Oriented Programming** : Introduction, Need of OOP, principles of Object-Oriented languages, Procedural language Vs OOP, Application of OOP, Java Virtual Machine, Java features, program structures, **Java programming constructs** : Variables, Primitive data types, Identifiers, **Literals, Operator** : Arithmetic operators, relational operators, Assignment operators, Expressions, Precedence Rules and Associativity, Primitive Type Conversion and casting.

**UNIT-II : Classes and Objects** : Classes, Objects, Creating objects, Methods, Constructors, Class Variable and Methods, **Selection statement** : if, nested if, switch statement, **Looping statements** : while, do-while, for, nested loops, this keyword, **Arrays** : Basics one dimensional, Multidimensional, array of objects, Passing array to method, Command line Arguments.

**UNIT-III: Inheritance**: Inheritance Vs Aggregation, Method Overriding, Super keyword, final keyword, Abstract class, interfaces, **packages and Enumeration**: Packages, Java.lang package, Enum type. **Exception Handling**: Introduction, Exception handling techniques, User defined exception, **Input/Output** : The java.io.file class, Reading and writing data, Randomly accessing a file, Reading and writing files using I/O package.

**UNIT-IV : Applets** : Introduction, Applet Class, Applet structure, Applet Life Cycle, Common methods used in displaying the output, paint (), update () and repaint (), More about applet tag, get Document Base () and get Code Base () methods, Applet context Interface, Graphic Class, Color, Font, Font Metrics. **Event Handling**: Introduction, Event delegation Model, java.awt.event description, Sources of events, Event Listeners, Adapter classes, Inner classes. **Abstract window Toolkit**: Introduction, Components and

Containers, Button, Label, Checkbox, Radio Buttons, List Boxes, Choice Boxes, Textfield and Textarea, Container Class, Layouts, Menu, Scrollbar.

**Text Book:**

Sachin Malhotra and Saurabh Choudhary, Programming in Java, Oxford University Press 2018.

**REFERENCE BOOKS:**

1. “Java A Practioner Approach Towards Conceptualisation”, Sajidullah S. Khan: ABC Press 2015
2. Java Complete References, Herbert Scheldt: (Mc Graw Hill)
3. Programming with Java, E. Balagurusamy: (Mc Graw Hill)

**PRACTICAL: Practicals based on syllabus of Java Programming**

**Subject Code: 4BVCS11**

**Field Visit / Industrial Visit**

Visit to any IT industries/ workshop/ College/University/technical expo/National and International exhibitions.

Report writing based on the above work.

Assessment done on the basis of viva voce and report by the teaching faculty

## **SEMESTER V**

**Subject Code: 5BVCSD3 & 5BVCSD7**

### **PROGRAMMING IN VISUAL BASIC**

**NSQF LEVEL: 6**

**QP CODE: SSC/Q0501**

#### **AIM:**

This course aims to introduce students to the syntax of various statements of visual basics and use of same for application development.

#### **OBJECTIVES:**

1. To develop application using visual basic.
2. To understand the programming algorithm, process and structure.
3. To understand and use the concepts of objects, primitive value, message, method, selection control structure, repetition control structure, object reference, container and method parameter.

**UNIT-I : Programming fundamentals** : Variables, Data types, Constant, Conversation function, Scope of variables : Public, Private, Static, Operators, Control statements, working with visual basic Window components, working with Form.

**UNIT-II: Arrays:** Dynamic array, Preserve and control arrays, **Procedure:** General Procedure, General method for passing argument to a procedure, **functions:** String, Math, Date and Conversation functions modules: Form standard.

**UNIT-III: Menus:** Working with menu, Adding separators arc, code for menu, Creating Popup menu: System, Custom, **Database handling:** Database concept, Creating and Accessing Database using data control, Using DAO: Creating Search Program, Numeric search and Complex Search programs,

**UNIT-IV:** Using ADO Data control: Data link, ODBC Data source name, using connection string, Creating Navigation buttons, Working with advance Data control: Data list control, Data combo control, Data grid control and Msflexgrid control. **Handling Errors:** Run Time, Trapping and Handling error, ER Object. Data environment and Data Reports.

#### **REFERENCE BOOKS:**

1. VISUAL BASIC – to advance By Soma dasgupta (BPB Publication)
2. Mastering Visual Basic 6.0, Evangel ospetroustos (BPB Publication)
3. Visual Basic 6, Coplete Reference (TMH Publication)
4. Visual Basic 6, Deitel & Deitel (Pearson Education)

5. Mastering VB 6.0 block book – Peter-Norton-Techmedia

**PRACTICAL: Practicals based on syllabus of Programming in Visual Basic**

**Subject Code: 5BVCSD4 & 5BVCSD8**

**COMPUTER GRAPHICS**

NSQF LEVEL: 6

QP CODE: SSC/Q0501

**AIM:**

This course introduces the concepts and implementation of Computer Graphics.

**OBJECTIVES:**

- To identify and explain the core concepts of computer graphics.
- To apply graphics programming techniques to design, and create computer graphics scenes.
- Create effective programs to solve graphics programming issues, including objects modeling, color modeling, lighting, textures and ray tracing.

**UNIT-I :** An overview of Computer Graphics and Graphics System : Video display devices, Raster-scan systems, Random-scan systems, Graphics monitors and workstations, Input devices, Hard copy devices, graphics software.

**UNIT-II :** Output Primitives : Point and Lines, Line drawing algorithms, Loading the frame buffer, line function, circle and ellipse generating algorithms, curves, parallel curves algorithms, Pixel addressing, filled –area primitives, functions, Cell array, character generation.

**UNIT-III:** Attributes of output primitives: Line and curve attributes, color and grayscale levels, area fill attributes, Character attributes, bundled attributes, anti-aliasing.

**UNIT-IV:** 2-D geometric transformations : Basic transformations, Matrix representations, composite transformations, other transformations, transformations between coordinate systems, affine transformations, transformation functions, Raster methods for transformations, two-dimensional viewing : Viewing coordinates, Window to viewport coordinate transformation, viewing functions, Clipping : point-line, polygon, curve, text, exterior.

**TEXT BOOK:**

D. Hearn, M.P. Baker: Computer Graphics, Second Edition, Pearson education.

**REFERENCES:**

1. F.S. Hill: Computer Graphics Using OpenGL, II edition, Pearson Education.
2. W.M.Newman & R.F.Sproul: Principles of Interactive Computer Graphics, 2e, McGraw Hill.
3. F.S.Hill: Computer Graphics, Mc Millan.
4. D.Hearn & M.P.Baker: Computer Graphics, Prentice Hall.
5. Hamington: Computer Graphics, McGraw Hill.

**PRACTICAL: Practicals based on syllabus of Computer Graphics.**

**Subject Code: 5BVCSD9**  
**SEMINAR & PROJECT PHASE-I**

Seminar on the latest related topic.

Assessment done on the basis of work done, viva voce and Project report

## **SEMESTER VI**

**Subject Code: 6BVCSD3 & 6BVCSD7**

### **MULTIMEDIA TECHNOLOGIES**

**NSQF LEVEL: 6**

**QP CODE: SSC/Q0501**

#### **AIM:**

This course involves concepts of multimedia, uses and making of multimedia.

#### **OBJECTIVES:**

- To formulate a working definition of interactive multimedia.
- To demonstrate competence in using the authoring program.
- To demonstrate the use of animation, digitized sound, video control and scanned images.
- To develop conceptual maps of content and process for interactive multimedia instructional programs.

**UNIT-I** : Introduction to Multimedia overview : Communication and Information transfer Model, Human Computer communication, Components of Multimedia, Multimedia building blocks, **Scope of Multimedia** : Overview, Application purposes, Taxonomy of Multimedia, Information systems, Application examples, Electronic performance support system, **Interaction technologies and Devices** : Overview, Human computer interface, Input and output technologies, Combined Input Output device, Storage technologies, Communication and network technologies, Processing technologies.

**UNIT-II**: Compression technologies for Multimedia: Overview, the need for data compression, Compression basics, Lossless Compression, Lossy compression techniques.

**UNIT-III** : Digital Images : Overview, Uses of images and graphics, Image representation, Image acquisition, Picture display, Working with image, Computer graphics and image editing : Overview, Uses of computer graphics, Representation of computer graphics, 2D graphics transformations, Working with graphics, Basic image editing steps, Digital Audio : Overview, Implications, producing digital audio, Psychoacoustics, processing sound, representation audio files.

**UNIT-IV** : Creating Animation and Flash : Overview, Introduction to flash animation, Introduction to flash, Working with timeline and frame based animation, Working with the timeline and tween based animation, Understanding layers, Action script, Technology trends,

designing Multimedia : Overview, Development phases and development teams, Analysis phase, Design phase, Development phase, Implementation phase, Evaluation and testing phase.

**REFERENCE BOOKS:**

1. "Multimedia Technologies", Ashok Banerji, Ananda Mohan Ghosh, (Tata McGraw Hill)
2. "Principles of Multimedia", Rajan Parekh (Tata McGraw Hill)
3. "Multimedia programming", S.J.Gobbs & D.C. Tschritzis, Addison Wesley 1995
4. "Distributed Multimedia", P.W.Agnew & A.S.Kellerman Addison Wesley 1996
5. "A Technical Introduction to Digital Video", C.A.Poynton, Wiley 1996
6. "Understanding Networked Multimedia", F. Fluckiger, Prentice-Hall 1995

**PRACTICAL: Practicals based on syllabus of Multimedia Technologies.**

**Subject Code: 6BVCSD4 & 6BVCSD8**

**E-COMMERCE**

**NSQF LEVEL: 6**

**QP CODE: SSC/Q0501**

**AIM:**

This course involves concepts of electronic marketing, legal issues, business models, business strategies.

**OBJECTIVES:**

- To develop an understanding of scope of E-Commerce
- To develop an understanding of electronic market and market place.
- To develop an understanding of business models.
- To develop an understanding of legal issues, threats of E-Commerce.

**UNIT-I: E-Commerce:** The difference between E-Commerce and E-business, Why study E-Commerce. Eight unique features of E-Commerce technology, Types of E-Commerce, Growth of the Internet and the Web, Origins and growth of E-Commerce, E-Commerce – A brief History.

**UNIT-II: E-Commerce Business Models and Concepts:** E-Commerce business model-high key elements of business model, Major Business-to-Consumer (B2C) business models, Major Business-to-business (B2B) business model: Business models emerging in E-Commerce areas, How the Internet and the WEB change business, strategy, structure and process.

**UNIT-III: E-Commerce Infrastructure:** The Internet: Technology background, The Internet today, Internet II, The future infrastructure, The World Wide Web, the Internet and web features, Building an E-Commerce Website: Building an E-Commerce Web site.

**UNIT-IV: Online Security and payment systems:** The E-Commerce Security Environment, Security threads in the E-Commerce environment, Technology solutions, Management policies, Business procedures and public laws, Payment systems, E-Commerce marketing concepts.

**TEXT BOOK:**

Keneth C Laudon, Carol Gurcio Trave “E-Commerce Business, Technology, Society” (Pearson)

**REFERENCES:**

1. Dave Chaffley “E-Business and E-Commerce Management” , 3<sup>rd</sup> Edition (Pearson)
2. Kalkakofa Whirttoton, “Frontiers of E-Commerce” Pearson.

**PRACTICAL: Practicals based on syllabus of E-Commerce.**

**Subject Code: 6BVCSD9**  
**PROJECT PHASE-II**

Assessment done on the basis of work done, viva voce and Project report

