**BVSD-101:** **PC Software**

**External Marks: 80**
**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT - I**

MS-Windows: Operating system-Definition & functions, basics of Windows. Basic components of windows, icons, types of icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders. Control panel – display properties, adding and removing software and hardware, setting date and time, screensaver and appearance using windows accessories.

**UNIT - II**

Documentation Using MS-Word - Introduction to word processing interface, Toolbars, Menus, Creating & Editing Document, Formatting Document, Finding and replacing text, Format painter, Header and footer, Drop cap, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Previewing and printing document, Advance Features of MS-Word-Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

**UNIT - III**

Electronic Spread Sheet using MS-Excel - Introduction to MS-Excel, Cell, cell address, Creating & Editing Worksheet, Formatting and Essential Operations, Moving and copying data in excel, Header and footer, Formulas and Functions, Charts, Cell referencing, Page setup, Macros, Advance features of MS-Excel-Pivot table & Pivot Chart, Linking and Consolidation, Database Management using Excel-Sorting, Filtering, Validation, What if analysis with Goal Seek, Conditional formatting.

**UNIT - IV**

Presentation using MS-PowerPoint: Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect., Introduction to MS Access: creating database creating and manipulating tables, forms, queries, reports, modules, importing and exporting of data.

**SUGGESTED READINGS**

1. Microsoft Office – Complete Reference – BPB Publication
2. Learn Microsoft Office – Russell A. Stultz – BPB Publication
3. Courter, G Marquis (1999). Microsoft Office 2000: Professional Edition. BPB.
4. Koers, D (2001). Microsoft Office XP Fast and Easy. PHI.
5. Nelson, S L and Kelly, J (2002). Office XP: The Complete Reference. Tata McGraw-Hill.

**Note:** Latest and additional good books may be suggested and added from time to time.

**BVSD-102:** # Programming in 'C' Language

**External Marks: 80**

**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT-I**

Overview of C: History of C, Importance of C, Elements of C: C character set, identifiers and keywords, Data types, Constants and Variables, Assignment statement, Symbolic constant, Structure of a C Program, printf(), scanf() Functions, Operators & Expression: Arithmetic, relational, logical, BVSDwise, unary, assignment, shorthand assignment operators, conditional operators and increment and decrement operators, Arithmetic expressions, evaluation of arithmetic expression, type casting and conversion, operator hierarchy & associativity.

**UNIT-II**

Decision making & branching: Decision making with IF statement, IF-ELSE statement, Nested IF statement, ELSE-IF ladder, switch statement, goto statement. Decision making & looping: For, while, and do-while loop, jumps in loops, break, continue statement, Nested loops.

**UNIT-III**

Functions: Standard Mathematical functions, Input/output: Unformatted & formatted I/O function in C, Input functions viz. getch(), getche(), getchar(), gets(), output functions viz., putch(), putchar(), puts(), string manipulation functions. User defined functions: Introduction/Definition, prototype, Local and global variables, passing parameters, recursion.

**UNIT-IV**

Arrays, strings and pointers: Definition, types, initialization, processing an array, passing arrays to functions, Array of Strings. String constant and variables, Declaration and initialization of string, Input/output of string data, Introduction to pointers. Storage classes in C: auto, extern, register and static storage class, their scope, storage, & lifetime.

Algorithm development, Flowcharting and Development of efficient Program in C.

**SUGGESTED READINGS**

1. Gottfried, Byron S., Programming with C, Tata McGraw Hill
2. Gill Nasib Singh: Computing Fundamentals and Programming in C, Khanna Books Publishing Co., New Delhi.
3. Balagurusamy, E., Programming in ANSI C, 4E, Tata McGraw-Hill
4. Jeri R. Hanly & Elliot P. Koffman, Problem Solving and Program Design in C, Addison Wesley.
5. Yashwant Kanetker, Let us C, BPB.
6. Rajaraman, V., Computer Programming in C, PHI.
7. Yashwant Kanetker, Working with C, BPB.

**Note:** Latest and additional good books may be suggested and added from time to time.

## BVSD-103: COMMUNICATION SKILLS

**External Marks: 80**
**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT-I**

Introduction to Basics of Communication: Communication and its various definitions, features/characteristics of the communication, process of communication, communication model and theories, barrier to effective communication.

**UNIT-II**

Improving LSRW: introduction, verbal and nonverbal communication, listening process, group discussion, forms of oral presentation, self-presentation, dyadic communication, 5C's of communication, Developing dialogues, soft skill.

**UNIT-III**

Basic vocabulary: how to improve vocabulary, prefix/suffix, synonyms/antonyms, one word substitution, spellings Developing fluency: Grammar (conjunction, auxiliaries, prepositions, articles, tenses……), language games.

**UNIT-IV**

Proper use of Language: The Communication Skills, The effective Speech. Effective self-presentation & facing interview: The interview process & preparing forit, The presentation skills.

**SUGGESTED READINGS**

1. Vik, Gilsdorf, "Business Communication", Irwin
2. K K Sinha, "Business Communication", Himalaya Publishing House / Galgoria Publication
3. Bovee, "Business Communication", Pearson ' PHI
4. Mohan, Banerjee, Business Communication, Mac million
5. Raman, Singh – Business communication – Oxford Press

**Note:** Latest and additional good books may be suggested and added from time to time.

**BVSD-104:** **Software Lab- I**

**External Marks: 80**
**Internal Marks: 20**

**Based on paper BVSD-101**

**Note: Paper BVSD -104 Practical (Ms-Office) for External Marks 80 will be conducted by External Examiner appointed by University.**

**BVSD-105: Software Lab- II**

**External Marks: 80**
**Internal Marks: 20**

**Based on paper BVSD-102**

**Note: Paper BVSD -105, Practical ('C' Language) for External Marks 80 will be conducted by External Examiner appointed by University.**

**BVSD-106:** # Data Structure Through 'C'

**External Marks: 80**

**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

## Unit-I

Introduction: Elementary data organization, Data Structure definition, Data type vs. data structure, Categories of data structures, Data structure operations, Applications of data structures, Algorithms complexity and time-space tradeoff, Big-O notation. Strings: Introduction, Storing strings, String operations, Pattern matching algorithms. Arrays: Introduction, Linear arrays, Representation of linear array in memory Multidimensional arrays, Operations in Arrays, Sparse arrays. Linked List: Introduction, Array vs. linked list, Representation of linked lists in memory, Traversal, Insertion, Deletion, Searching in a linked list, Header linked list, Circular linked list, Two-way linked list, Threaded lists, Garbage collection, Applications of linked lists.

**UNIT – II**

Stack: Introduction, Array and linked representation of stacks, Operations on stacks, Applications of stacks: Polish notation, Recursion. Queues: Introduction, Array and linked representation of queues, Operations on queues, Deques, Priority Queues, Applications of queues. Tree: Introduction, Definition, Representing Binary tree in memory, Traversing binary trees, Traversal algorithms using stacks Tree: Header nodes, Threads, Binary search trees, Searching, Insertion and deletion in a Binary search tree, AVL search trees, Insertion and deletion in AVL search tree. B-trees, Searching, Insertion and deletion in a B-tree, B+tree, Huffman's algorithm, General trees.

**UNIT – III**

Graph: Introduction, Graph theory terminology, Sequential and linked representation of graphs. Graphs: Warshall's algorithm for shortest path, Dijkstra algorithm for shortest path, Operations on graphs, Traversal of graph, Sorting: Internal & external sorting, Radix sort, Quick sort, Heap sort, Merge sort, Tournament sort, Searching: Liner search, binary search, merging, Comparison of various sorting and searching algorithms on the basis of their complexity.

**UNIT – IV**

Files: Physical storage devices and their characteristics, Attributes of a file viz fields, records, Fixed and variable length records, Primiry and secondary keys, Classification of files, File operations, Comparison of various types of files, File organization: Serial, Sequential, Indexed-sequential, Random-access/Direct, Inverted, Multilist file organization. Hashing: Introduction, Hashing functions and Collision resolution methods .

**SUGGESTED READINGS**

1. Seymour Lipschutz, "Data Structure", Tata-McGraw-Hill
2. Horowitz, Sahni & Anderson-Freed, "Fundamentals of Data Structures in C",Orientlongman.
3. Trembley, J.P. And Sorenson P.G., "An Introduction to Data Structures With Applications", Mcgrraw- Hill International Student Edition, New York.
4. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Addison- Wesley, (An Imprint Of Pearson Education), Mexico City.Prentice- Hall Of India Pvt. Ltd.,New Delhi.

**Note:** Latest and additional good books may be suggested and added from time to time.

## BVSD-107: Object Oriented Programming using C++

**External Marks: 80**
**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT-I**

Introduction to C++ - key concepts of Object-Oriented Programming –Advantages – Object Oriented Languages – I/O in C++ - C++ Declarations. Control Structures : - Decision Making and Statements : If .. else ,jump, goto, break, continue, Switch case statements - Loops in C++ : For,While, Do - Functions in C++ - Inline functions – Function Overloading.

**UNIT-II**

Classes and Objects : Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects –friend functions – Overloading member functions – BVSD fields and classes – Constructor and destructor with static members.

**UNIT-III**

Operator Overloading: Overloading unary, binary operators – Overloading Friend functions – type conversion – Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchal, Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes.

**UNIT-IV**

Pointers – Declaration – Pointer to Class , Object – this pointer – Pointers to derived classes and Base classes – Arrays – Characteristics – array of classes – Memory models – new and delete operators – dynamic object – Binding , Polymorphism and Virtual Functions. Files – File stream classes – file modes – Sequential Read / Write operations – Binary and ASCII Files – Random Access Operation – Templates – Exception Handling - String – Declaring and Initializing string objects – String Attributes – Miscellaneous functions .

**SUGGESTED READINGS**


1. Ashok N Kamthane , OBJECT-ORIENTED PROGRAMMING WITH ANSI AND TURBOC C++, Pearson Education publication. 2003.
2. E. Balagurusamy, OBJECT-ORIENTED PROGRAMMING WITH C++, Tata Mc-Grawhill Pupblication, 1998.
3. Maria Litvin & Gray Litvin , C++ for you, Vikas publication, 2002.
4. John R Hubbard, Programming with C, 2nd Edition, TMH publication, 2002.


**Note:** Latest and additional good books may be suggested and added from time to time.

# Environmental Science

**PAPER CODE: BVSD-108**

**External Marks: 80**

**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT-I**

Environmental studies – Nature, scope and importance, need for public awareness; natural resources – renewable and non-renewable resources, use an overexploitation/ over-utilization of various resources and consequences; role of an individual in conservation of natural resources; equitable use of resources for sustainable lifestyles

**UNIT-II**

Ecosystems – concept, structure and function of an ecosystem; energy flow in the ecosystem; ecological succession; food chains, food webs and ecological pyramids; types of ecosystem – forest ecosystem, grassland ecosystem, desert ecosystem, aquatic. Ecosystems Environmental Pollution – Definition, cause, effects and control measures of different types of pollutions – air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, nuclear hazards; solid waste management – causes, effects and control measures of urban and industrial wastes; role of an individual in prevention of pollution

**UNIT-III**

Social issues and the environment – Sustainable development, urban problems related to energy, water conservation, rain water harvesting, watershed management; resettlement and rehabilitation of people, its problems and concerns; climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust; Wasteland reclamation, consumerism and waste products

**UNIT-IV**

Environmental legislation – Environment Protection Act. Air (prevention and control of pollution) Act. Water (prevention and control of pollution) Act, Wildlife Protection Act, Forest Conservation Act

**SUGGESTED READINGS:**

1. Rajagopalan R, Environmental Studies, Oxford University Press, New Delhi
2. Kaushik Anubha, C.P. Kaushik, Perspective in Environmental Studies, New Age International (P) Ltd. Publishers
3. Joseph Benny, Environmental Studies, Tata McGraw Hill Publishing Company Ltd., New Delhi
4. Ubaroi, N.K., Environment Management, Excel Books, New Delhi

**Note:** Latest and additional good books may be suggested and added from time to time

**BVSD-109:** **Software Lab-III**

**External Marks: 80**
**Internal Marks: 20**

Based on paper BVSD-106

Note: Paper BVSD -109 Practical (**Data Structure Through 'C'**) for External Marks 80 will be conducted by External Examiner appointed by University.

**BVSD-110:** **Software Lab-III**

**External Marks: 80**
**Internal Marks: 20**

Based on paper BVSD-107

Note: Paper BVSD -110 Practical (**Object Oriented Programming using C++**) for External Marks 80 will be conducted by External Examiner appointed by University.

**BVSD-201:** # Web Designing

**External Marks: 80**
**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT – I**

Introduction to Internet and World Wide Web; Evolution and History of World Wide Web; Basic features; Web Browsers; Web Servers; Hypertext Transfer Protocol, Overview of TCP/IP and its services; URLs; Searching and Web-Casting Techniques; Search Engines and Search Tools;

**UNIT – II**

Web Publishing: Hosting your Site; Internet Service Provider; Web terminologies, Phases of Planning and designing your Web Site; Steps for developing your Site; Choosing the contents; Home Page; Domain Names, Front page views, Adding pictures, Links, Backgrounds, Relating Front Page to DHTML.Creating a Website and the Markup Languages (HTML, DHTML);

**UNIT – III**

Web Development: Introduction to HTML; Hypertext and HTML; HTML Document Features; HTML command Tags; Creating Links; Headers; Text styles; Text Structuring; Text colors and Background; Formatting text; Page layouts;

**UNIT – IV**

Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes; DHTML: Dynamic HTML, Features of DHTML,CSSP(cascading style sheet positioning) and JSSS(JavaScript assisted style sheet), Layers of netscape, The ID attributes, DHTML events.

**SUGGESTED READINGS**

1. Raj Kamal, "Internet and Web Technologies", Tata McGraw-Hill.
2. Ramesh Bangia, "Multimedia and Web Technology", Firewall Media.
3. Thomas A. Powell, "Web Design: The Complete Reference" , 4/e, Tata McGraw- Hill
4. Wendy Willard, "HTML Beginners Guide", Tata McGraw-Hill.
5. Deitel and Goldberg, "Internet and World Wide Web, How to Program", PHI.

**Note:** Latest and additional good books may be suggested and added from time to time.

**BVSD-202:** # JAVA Programming

**External Marks: 80**
**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT-I**

Fundamentals of Object-Oriented Programming: Object-Oriented Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of Object-Oriented Programming – Application of Object-Oriented Programming. Java Evolution: History – Features – How Java differs from C and C++ – Java and Internet – Java and www –Web Browsers. Overview of Java: simple Java program – Structure – Java Tokens – Statements – Java Virtual Machine.

**UNIT-II**

Constants, Variables, Data Types - Operators and Expressions – Decision Making and Branching: if, if ..else, nested if, switch, ? : Operator - Decision Making and Looping: while, do, for – Jumps in Loops - Labeled Loops – Classes, Objects and Methods.

**UNIT-III**

Arrays, Strings and Vectors – Interfaces: Multiple Inheritance – Packages: Putting Classes together – Multithreaded Programming.

**UNIT-IV**

Managing Errors and Exceptions – Applet Programming – Graphics Programming. Managing Input / Output Files in Java : Concepts of Streams- Stream Classes – Byte Stream classes – Character stream classes – Using streams – I/O Classes – File Class – I/O exceptions – Creation of files – Reading / Writing characters, Byte-Handling Primitive data Types – Random Access Files.

**SUGGESTED READINGS**

1.PROGRAMMING WITH JAVA – A PRIMER - E. Balagurusamy, 3rd Edition, TMH
2.THE COMPLETE REFERENCE JAVA 2 - Patrick Naughton & Hebert Schildt, 3rd ed,TMH
3.PROGRAMMING WITH JAVA – John R. Hubbard, 2nd Edition, TMH.

**Note:** Latest and additional good books may be suggested and added from time to time.

**BVSD-203:** # Discrete Mathematics

**External Marks: 80**
**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT – I**

Set theory-Introduction-Set & its Elements-Set Description-Types of sets-Venn-Euler Diagrams-Set operations & Laws of set theory-Fundamental products-partitions of sets-minsets- Algebra of sets and Duality-Inclusion and Exclusion principle

**UNIT – II**

Mathematical logic – Introduction- prepositional calculus –Basic logical operations- Tautologies-Contradiction-Argument-Method o f proof- Predicate calculus.

**UNIT – III**

Relations – Binary Relations – Set operation on relations-Types of Relations – Partial order relation – Equivalence relation – Composition of relations – Functions – Types of functions – Invertible functions – Composition of functions.

**UNIT – IV**

Languages – Operations on languages – Regular Expressions and regular languages – Grammar – Types of grammars – Finite state machine – Finite – State automata Graph Theory – Basic terminology – paths, cycle & Connectivity – Sub graphs – Types of graphs – Representation of graphs in compute memory - Trees – Properties of trees – Binary trees – traversing Binary trees – Computer Representation of general trees.

**SUGGESTED READINGS**


1. Discrete Mathematics – J.K. Sharma Second Edition – 2005 , Macmillan India Ltd.
2. Discrete Mathematics Structures with Applications to computer science - J. P Tremblay R Manohar – Mc Graw Hill International Edition
3. Discrete Mathematics – Dr M. K. Venketaramen, Dr N.Sridharan, N.Chandarasekaran – The National publishing Company Chennai.


**Note:** Latest and additional good books may be suggested and added from time to time.

**BVSD-204:** **Software Lab-V**

**External Marks: 80**
**Internal Marks: 20**

Based on paper BVSD-201

Note: Paper BVSD -204 Practical (HTML, DHTML) for External Marks 80 will be conducted by External Examiner appointed by University.

**BVSD-205:** **Software Lab-VI**

**External Marks: 80**
**Internal Marks: 20**

Based on paper BVSD-202

Note: Paper BVSD -205 Practical (Java) for External Marks 80 will be conducted by External Examiner appointed by University.

**BVSD-206:** # Computer Networks

**External Marks: 80**
**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**Unit-I**

**Introduction to communications and Networking :** Introduction – Fundamental concepts - Data communications – Protocols- standards - Standards organizations - Signal propagations- Analog and Digital signals- Bandwidth of a signal and a medium - Fourier analysis and the concept of bandwidth of a signal - The data transmission rate and the bandwidth. **Information encoding:** Introduction – Representing different symbols- Minimizing errors- Multimedia – Multimedia and Data compression.

**UNIT- II**

**Analog and digital transmission methods:** Introduction - Analog signal, Analog transmission - Digital signal, Digital transmission - Digital signal , Analog transmission - Baud rate and BVSDs per second - Analog signal, Digital (Storage and) transmission - Nyquist Theorem. **Modes of data transmission and Multiplexing:** Introduction – Parallel and Serial communication - Asynchronous, Synchronous and Isochronous communication - Simplex, Half-duplex and Full-duplex communication – Multiplexing - Types of Multiplexing - FDM versus TDM. **Transmission Errors: Detection and correction:** Introduction – Error classification – Types of Errors – Error detection.

**UNIT- III**

**Transmission media:** Introduction - Guided media - Unguided media - Shannon capacity. **Network topologies, switching and routing algorithms:** Introduction - Mesh topology - Star topology - Tree topology - Ring topology - Bus topology - Hybrid topology - Switching basics- Circuit switching – Packet switching - Message switching - Router and Routing – Factors affecting routing algorithms - Routing algorithm -Approaches to routing.

**UNIT- IV**

**Networking protocols and OSI model:** Introduction – Protocols in computer communications - The OSI model - OSI layer functions. **Integrated services digital networking (ISDN):** Introduction – Background of ISDN - ISDN architecture – ISDN interfaces - Functional grouping – Reference points - ISDN protocol architecture - Broadband ISDN (B-ISDN) of ATM – Packet size – Virtual circuits in ATM – ATM cells – Switching – ATM layers – Miscellaneous Topics, Network protocols; IP, IPv4, IPv6, UPD, TCP,HTTP, SHTTP, FTP, POP, SMTP, etc.

**SUGGESTED READINGS**

1.COMPUTER NETWORKS – Andrew S. Tanenbaum, 4th edition, PHI.
2.DATA COMMUNICATION AND NETWORKS – Achyut Godbole, 2007, TMH.. COMPUTER NETWORKS Protocols, Standards, and Interfaces – Uyless Black, 2nd ed, PHI.

**Note:** Latest and additional good books may be suggested and added from time to time.

**BVSD-207:** # Advanced Java

**External Marks: 80**
**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT - I**

Introduction to Java, Data types, variables, operators, Arrays, Control Statements, Classes & Methods, Inheritance, Exception Handling, Multithreading, Collections, I/O streams, AVVT & Applet programming. Connecting to a Server, Implementing Servers, Sending E-Mail, Making URL Connections, Advanced Socket Programming

**UNIT- II**

The Design of JDBC. The Structured Query Language, JDBC Installation, Basic JDBC Programming Concepts, Query Execution, Scrollable and Updatable Result Sets, Metadata, Row Sets, Transactions, Advanced Connection Management, Introduction of LDAP The Roles of Client and Server, Remote Method Invocations, Setup for Remote Method Invocation, Parameter Passing in Remote Methods Server Object Activation, Java IDL and CCRA, Remote Method Calls with SOAP

**UNIT III**

SWING Lists, Trees, Tables, Styled Text Components, Progress Indicators, Component Organizers AWT The Rendering Pipeline, Shapes, Areas, Strokes, Paint, Coordinate Transformations, Clipping, Transparency and Composition, Rendering Hints, Readers and Writers for Images, Image Manipulation, Printing. The Clipboard, Drag and Drop

**UNIT IV**

JAVABEANS COMPONENTS Beans, The Bean-Writing Process, Using Beans to Build an Application, Naming Patterns for Bean Components and Events Bean Property Tubes Bean info Classes Property Editors Customizes SECURITY Class Loaders, Byte code Verification, Security Managers and Permissions, Digital Signatures, Code Signing, Encryption

**Suggested Readings:**

1. Core JavaTM 2, Volume II-Advanced Features, 7th Edition by Cay Horetmann,
Gary Cornelll Pearson Publisher, 2004
2. Professional Java Programming by Brett Spell, WROX Publication
3. Advanced Java 2 Platform, How to Program, 2nd Edition, Harvey. M. Dietal, Prentice Hall
4. Advanced Java, Gajendra Gupta , Firewall Media

**Note:** Latest and additional good books may be suggested and added from time to time.

**BVSD-208:** # PHP Programming

**External Marks: 80**
**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT – I**

Introducing PHP – Basic development Concepts – Creating first PHP Scripts – Using Variable and Operators – Storing Data in variable – Understanding Data types – Setting and Checking variables Data types – Using Constants – Manipulating Variables with Operators.

**UNIT – II**

Controlling Program Flow: Writing Simple Conditional Statements - Writing More Complex Conditional Statements – Repeating Action with Loops – Working with String and Numeric Functions.

**UNIT – III**

Working with Arrays: Storing Data in Arrays – Processing Arrays with Loops and Iterations – Using Arrays with Forms - Working with Array Functions – Working with Dates and Times.

**UNIT – IV**

Using Functions and Classes: Creating User-Defined Functions - Creating Classes – Using Advanced OOP Concepts. Working with Files and Directories: Reading Files-Writing Files-Processing Directories.Working with Database and SQL : Introducing Database and SQL- Using MySQL-Adding and modifying Data-Handling Errors – Using SQLite Extension and PDO Extension. Introduction XML—Simple XML and DOM Extension.

**SUGGESTED READINGS**


1. Christopher J.Goddard, Mark White, ―Mastering VB Script‖, Galgotia publications, New Delhi.
2. Lee Purcell, Mary Jane Mara, ―The ABCs of Javascript
3. Steven Holzner, ―PHP: The Complete Reference


**Note:** Latest and additional good books may be suggested and added from time to time.

**BVSD-209:** **Software Lab-VII**

**External Marks: 80**
**Internal Marks: 20**

Based on paper BVSD-207

Note: Paper BVSD -209 Practical (Advance Java) for External Marks 80 will be conducted by External Examiner appointed by University.

**BVSD-210:** **Software Lab-VIII**

**External Marks: 80**
**Internal Marks: 20**

Based on paper BVSD-208

Note: Paper BVSD -210 Practical (PHP Programming) for External Marks 80 will be conducted by External Examiner appointed by University.

**BVSD-301:** # RDBMS and Oracle

**External Marks: 80**
**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT-I**

Database Concepts: A Relational approach: Database – Relationships – DBMS – Relational Data Model – Integrity Rules – Theoretical Relational Languages. Database Design: Data Modeling and Normalization: Data Modeling – Dependency – Database Design – Normal forms – Dependency Diagrams – De -normalization – Another Example of Normalization.

**UNIT-II**

Oracle9*i*: Overview: Personal Databases – Client/Server Databases – Oracle9i an introduction – SQL *Plus Environment – SQL – Logging into SQL *Plus - SQL *Plus Commands – Errors & Help – Alternate Text Editors - SQL *Plus Worksheet - *i*SQL *Plus. Oracle Tables: DDL: Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes.

**UNIT-III**

Working with Table: Data Management and Retrieval: DML – adding a new Row/Record – Customized Prompts – Updating and Deleting an Existing Rows/Records – retrieving Data from Table – Arithmetic Operations – restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE command – CASE structure. Functions and Grouping: Built-in functions –Grouping Data. Multiple Tables: Joins and Set operations: Join – Set operations.

**UNIT-IV**

PL/SQL: A Programming Language: History – Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators. Control Structures and Embedded SQL: Control Structures – Nested Blocks – SQ L in PL/SQL – Data Manipulation – Transaction Control statements. PL/SQL Cursors and Exceptions: Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT…FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions. PL/SQL Composite Data Types: Records – Tables – arrays. Named Blocks: Procedures – Functions – Packages –Triggers – Data Dictionary Views.

**SUGGESTED READINGS:**

1. DATABASE SYSTEMS USING ORACLE – Nilesh Shah, 2nd edition, PHI.
2. DATABASE MANAGEMNET SYSTEMS – Arun Majumdar & Pritimoy Bhattacharya, 2007, TMH.
3. DATABASE MANAGEMETN SYSTEMS – Gerald V. Post, 3rd edition, TMH.

**Note:** Latest and additional good books may be suggested and added from time to time.

# BVSD-302: Visual Programming –Visual Basic, Visual C++

**External Marks: 80**
**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT-I**

Introducing Visual Basic: What is VB? – Event and Event Procedures – Object related concepts – VB program Development Process- Logical Program Organization -VB Program Components – VB environment – Opening, Saving, Running a VB Project –Visual Basic Fundamentals: constants – Variables – Data Types and Declarations – Operators and Expressions – Program Comments. Branching and Looping: Relational operators and Logical Expressions – Branching with If-Then, If-Then-Else blocks – Selection Select Case – Looping with For-Next, Do-Loop, While-Wend – Stop statement.

**UNIT-II**

Visual Basic control Fundamentals: Control tools – Control tool Categories – Working with Controls – Naming Forms and Controls – Assigning Property values to Forms and Controls – Executing commands – Displaying Output – Entering Input Data – Selecting Multiple Features, Exclusive Alternatives, Form from a List - Assigning Properties collectively – Generating Error Messages – Creating timed Events – Scroll Bars. Menus and Dialog Boxes: Building Drop-Down Menus – Accessing Menu from Keyboard – Menu Enhancements – Submenus – Pop-Up Menus – Dialog Boxes – more about MsgBox Function – The Input Box function.

**UNIT-III**

Procedures: Modules and Procedures – Sub Procedures – Event Procedures – Function Procedures – Scope – Optional Arguments. Arrays: Characteristics – Declarations –Processing – Passing Arrays to Procedures – Dynamic Arrays – Array-related Functions – Control Arrays – Looping with for Each-Next. Data Files : Sequential Data Files – Random-Access Data files– Binary files.

**UNIT IV**

Visual C++: Programming: MFC and Windows – MFC Fundamentals – MFS Class Hierarchy – MFC Member & Global Functions – Various Object Properties – Cobject, CArchive, CWinApp, CWnd, CFile, CGD, Object, CExcept, CDialog, CString, CEdit, CList – Resources: Menus – Accelerators, Dialogs, Icons, BVSDmaps, Versions – Message Maps – Document/View Architecture. VC++ (Contd): connecting to Data Source – DAO – ODBC – Thread – Based Multitaksing – Visual C++ APPWIZARD and class Wizard, Concepts of MS SQL Server, Query Analyzer, Enterprise Manager, Creating database, tables, modules, users, roles, etc. Connectivity of VB applications with SQL database.

**SUGGESTED READINGS**


1. VISUAL BASIC – Byron S. Gottfried, Schaum‘s Outline series, TMH.
2. Eric A Smith, Valor Whisher, Hank Marquis, ―Visual Basic 6 Programming Bible
3. Herbert Schildt, ―MFC Programming From the Ground up, Second Edition, Tata McGrawHill.
4. Cornell, ―Visual Basic 6 From the Ground Up, Tata Mcgraw – Hill Company Ltd
5. Mveller, ―Visual C++ from the Ground up, TMCH.


**Note:** Latest and additional good books may be suggested and added from time to time.

## BVSD-303: Software Engineering

**External Marks: 80**
**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT-I**

Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models. **Software Requirements Analysis & Specifications:** Requirement engineering, requirement elicitation techniques like FAST, QFD, requirements analysis using DFD, Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS .

**UNIT – II**

**Software Project Management Concepts:** The Management spectrum, The People The Problem, The Process, The Project. **Software Project Planning:** Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, Risk Management.

**UNIT - III**

**Software Design:** Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design, Software Metrics: Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics, **Software Implementation**: Relationship between design and implementation, Implementation issues and programming support environment, Coding the procedural design, Good coding style.

**UNIT - IV**

**Software Testing:** Testing Process, Design of Test Cases, Types of Testing, Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing, Debugging Activities. **Software Maintenance:** Management of Maintenance, Maintenance Process, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation.

**SUGGESTED READINGS**


1. Software Engineering Concepts – Richard Fairley, 1997, Tmh.
2. Software Engineering For Internet Applications – Eve Anderson, Philip Greenspun, Andrew Grumet, 2006, Phi. 2. Software Engineering Project Management – 2nd Edition, Wiley India.
3. Software Quality Engineering – Jeff Tian, Student Edition, 2006, Wiley India


**Note:** Latest and additional good books may be suggested and added from time to time.

**BVSD-304:** **Software Lab-IX**

**External Marks: 80**
**Internal Marks: 20**

Based on paper BVSD-301

Note: Paper BVSD -304 Practical (Oracle) for External Marks 80will be conducted by External Examiner appointed by University.

**BVSD-305:** **Software Lab-X**

**External Marks: 80**
**Internal Marks: 20**

Based on paper BVSD-302

Note: Paper BVSD -305 Practical (**Visual Basic, Visual C++**) for External Marks 80will be conducted by External Examiner appointed by University.

## BVSD-306: Computer Graphics

**External Marks: 80**
**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT-I**

**Graphics Primitives**: Introduction to computer graphics, Basics of Graphics systems, Application areas of Computer Graphics, overview of graphics systems, video-display devices, and raster-scan systems, random scan systems, graphics monitors and workstations and input devices. **Output Primitives**: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary fill and floodfill algorithms .

**UNIT-II**

**2-D Geometrical Transforms**: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems. **2-D Viewing**: The viewing pipeline, viewing coordinate reference frame, window to viewport coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

**UNIT-III**

**3-D Object Representation**: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon-rendering methods.

**UNIT-IV**

**3-D Geometric Transformations**: Translation, rotation, scaling, reflection and shear transformations, composite transformations. **3-D Viewing**: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

**SUGGESTED READINGS**


1. COMPUTER GRAPHICS – Donald Hearn, M.Pauline Baker, 2nd edition, PHI.
2. PRINCIPLES OF MULTIMEDIA – Ranjan Parekh, 2007, TMH.
3. COMPUTER GRAPHICS – Amarendra N Sinha, Arun D Udai, TMH.
4. MULTIMEDIA: Making it Work – Tay Vaughan, 7th edition, TMH.


**Note:** Latest and additional good books may be suggested and added from time to time.

**BVSD-307:** # .NET Programming

**External Marks: 80**
**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT-I**

Basic of the .net framework: .net architecture, managed code, assemblies, CLR, execution of assemblies code, IL, JIT, .NET framework class library, common type system, common language specification, interoperability with unmanaged code.

**UNIT-II**

Introduction to VB.Net and C#: VB.Net: Net features, Data Types C#: Data Types, Operators, Garbage Collection, Jagged Array, Collection (Array list, Hash table), Indexer(One Dimension) and property, Delegates and events (Multicasting, Multicasting Event), Exception Handling.

**UNIT-III**

ADO.Net & Object Oriented Concepts (Using VB.Net or C#): Basic window control, Architecture of ADO.Net, Comparison with ADO, .Net Data provider, Data Adapter, Data Set, Data Row, Data Column, Data Relation, command, Data Reader, Data Grid Constructor, Destructor, Abstraction, interface, polymorphism (Over loading and over ridding)

**UNIT-IV**

ASP.Net : Anatomy of ASP.NET Page, Server Controls : label, dropdown list box, validation controls, list box, text box, radio button, check box, State Management: session, caching, Authentication (window,.Net Passport, Forms Based), Authorization, web services, Advance Grid Manipulation.

**SUGGESTED READINGS:**

1. Jeffrey Richter, Francesco Balena: Applied .Net Frmework Prog. In MS VB.Net, TMH Publication.
2. Herbert Schildt: Complete Reference C#, TMH Publication.
3. Michael Halvorsan: Microsoft Visual Basic.NET step by step, PHI Publication.
4. G.Andew Duthie: Microsoft ASP.Net With C#.Net step by step, PHI Publication.
5. Any other book(s) covering the contents of the paper in more depth.

**Note:** Latest and additional good books may be suggested and added from time to time.

**BVSD-308:** # Artificial Intelligence

**External Marks: 80**
**Time: 3 hours** **Internal Marks: 20**

**Note:** Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

**UNIT – I**

Overview of A.I: Introduction to AI, Importance of AI, AI and its related field, AI techniques, Criteria for success. Problems, problem space and search: Defining the problem as a state space search, Production system and its characteristics, Issues in the design of the search problem Heuristic search techniques : Generate and test, hill climbing, best first search technique, problem reduction, constraint satisfaction

**UNIT - II**

Knowledge Representation: Definition and importance of knowledge, Knowledge representation, Various approaches used in knowledge representation, Issues in knowledge representation. Using Predicate Logic : Represent ting Simple Facts in logic, Representing instances and is-a relationship, Computable function and predicate.

**UNIT - III**

Natural language processing: Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing. Learning: Introduction learning, Rote learning, Learning by taking advice, Learning in problem solving, Learning from example-induction, Explanation based learning.

**UNIT - IV**

**Expert System**: Introduction, Representing using domain specific knowledge, Expert system shells. Knowledge acquisition: General concepts in knowledge acquisition, early work in Machine Learning, examples of Inductive Learners, computer vision, Robotics, overview of LISP- AI language.

**SUGGESTED READINGS :**

1. Rich Elaine and : Artificial Intelligence, 2nd edition, Tata McGraw Hill .
Knight Kevin
2. Tani Moto : Introduction to AI using LISP.
3. Patterson : Artificial Intelligence and Expert Systems.
4. Winston, P.H. and: LISP B.K.P.
5. Sangal Rajeev : LISP Programming, Tata McGraw Hill.
6. Balagurusamy : Artificial Intelligence & Technology.
7. Mishkoff, Henry C: Understanding Artificial Intelligence, BPB Publ.
8. Bharti & Chaitenya: Natural Language Processing, PHI

**Note:** Latest and additional good books may be suggested and added from time to time.

**BVSD-309:** **Software Lab-XI**

**External Marks: 80**
**Internal Marks: 20**

Based on paper BVSD-306 & 307

Note: 1. Paper BVSD -309 Practical (Computer Graphic & .Net Programming) for External Marks 80 will be conducted by External Examiner appointed by University.

**BVSD-310:** # Project Work & Viva-Voce

**External Marks: 80**
**Time: 3 hours** **Internal Marks: 20**

The aim of the Project work is to acquire industrial knowledge on the implementation of the software development concepts. Each student should carry out individually one Project Work and it may be a work using the software tools/ languages that they have learned.

**Note: Paper BVSD -310 Project work and Viva-Voce, the Project will be allocated at the end of the B.Voc(Software Development) V Semester. The Project Work should be compulsorily done as a live project under the supervision of the Departmental faculty of the concerned college and the software Industry and Comprehensive Viva-Voce will be conducted by External Examiner to be appointed by the University.**

**Bachelor of Vocation in Software Development**

**B.Voc.(Software Development) w.e.f. 2014-15 session**

**Scheme of Examination and Curriculum for Bachelor of Vocation in Software Development**

**i.e. B.Voc.(Software Development)**

| Year-I Semester-1 | Paper Code | Name of Paper | Mode | Category | External Marks | Internal Marks | Total |
|---|---|---|---|---|---|---|---|
| SEM 1 | BVSD-101 | PC Software | Theory | Gen Ed* | 80 | 20 | 100 |
| SEM 1 | BVSD-102 | Programming in 'C' Language | Theory | Voc Ed* | 80 | 20 | 100 |
| SEM 1 | BVSD-103 | Communication Skills | Theory | Gen Ed | 80 | 20 | 100 |
| SEM 1 | BVSD-104 | Software Lab-I | Practical | Voc Ed | 80 | 20 | 100 |
| SEM 1 | BVSD-105 | Software Lab-II | Practical | Voc Ed | 80 | 20 | 100 |

**Note:** Paper BVSD -104 & 105, Practical for External Marks 80 will be conducted by External Examiner appointed by University.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Semester-II** | | | | | | | |
| SEM 2 | BVSD-106 | Data Structure through 'C' | Theory | Voc Ed | 80 | 20 | 100 |
| SEM 2 | BVSD-107 | Object Oriented Programming using | Theory | Voc Ed | 80 | 20 | 100 |
| SEM 2 | BVSD-108 | Environmental Science | Theory | Gen Ed | 80 | 20 | 100 |
| SEM 2 | BVSD-109 | Software Lab-III | Practical | Voc Ed | 80 | 20 | 100 |
| SEM 2 | BVSD-110 | Software Lab-IV | Practical | Voc Ed | 80 | 20 | 100 |

**Note:** Paper BVSD -109 & 110, Practical for External Marks 80 will be conducted by External Examiner appointed by University.

| Year-II Semester-III | Paper Code | Name of Paper | Mode | Category | External Marks | Internal Marks | Total |
|---|---|---|---|---|---|---|---|
| SEM 3 | BVSD-201 | Web Designing | Theory | Gen Ed | 80 | 20 | 100 |
| SEM 3 | BVSD-202 | Java Programming | Theory | Voc Ed | 80 | 20 | 100 |
| SEM 3 | BVSD-203 | Discrete Mathematics | Theory | Gen Ed | 80 | 20 | 100 |
| SEM 3 | BVSD-204 | Software Lab-V | Practical | Voc Ed | 80 | 20 | 100 |
| SEM 3 | BVSD-205 | Software Lab-VI | Practical | Voc Ed | 80 | 20 | 100 |

**Note:** Paper BVSD -204 & 205, Practical for External Marks 80 will be conducted by External Examiner appointed by University.

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|---|---|---|---|---|---|---|---|
| **Semester-IV** | | | | | | | |
| SEM 4 | BVSD-206 | Computer Networks | Theory | Gen Ed | 80 | 20 | 100 |

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|---|---|---|---|---|---|---|---|
| SEM 4 | BVSD-207 | Advanced Java | Theory | Voc Ed | 80 | 20 | 100 |
| SEM 4 | BVSD-208 | PHP Programming | Theory | Voc Ed | 80 | 20 | 100 |
| SEM 4 | BVSD-209 | Software Lab-VII | Practical | Gen Ed | 80 | 20 | 100 |
| SEM 4 | BVSD-210 | Software Lab-VIII | Practical | Voc Ed | 80 | 20 | 100 |

**Note:** Paper BVSD -209 & 210, Practical for External Marks 80 will be conducted by External Examiner appointed by University.

| **Year-III Semester-V** | **Paper Code** | **Name of Paper** | **Mode** | **Category** | **External Marks** | **Internal Marks** | **Total** |
|---|---|---|---|---|---|---|---|
| SEM 5 | BVSD-301 | RDBMS and Oracle | Theory | Voc Ed | 80 | 20 | 100 |
| SEM 5 | BVSD-302 | Visual Programming - Visual Basic, Vi | Theory | Gen Ed | 80 | 20 | 100 |
| SEM 5 | BVSD-303 | Software Engineering | Theory | Gen Ed | 80 | 20 | 100 |
| SEM 5 | BVSD-304 | Software Lab-IX | Practial | Voc Ed | 80 | 20 | 100 |
| SEM 5 | BVSD-305 | Software Lab-X | Practial | Voc Ed | 80 | 20 | 100 |

**Note:** Paper BVSD -304 & 305, Practical for External Marks 80 will be conducted by External Examiner appointed by University.

| **Semester-VI** | | | | | | | |
|---|---|---|---|---|---|---|---|
| SEM 6 | BVSD-306 | Computer Graphics | Theory | Gen Ed | 80 | 20 | 100 |
| SEM 6 | BVSD-307 | .NET Programming | Theory | Voc Ed | 80 | 20 | 100 |
| SEM 6 | BVSD-308 | Artificial Intelligance | Theory | Voc Ed | 80 | 20 | 100 |
| SEM 6 | BVSD-309 | Software Lab-XI | Practical | Voc Ed | 80 | 20 | 100 |
| SEM 6 | BVSD-310 | Project Work & Viva-Voce | **Industrial Pro** | Voc Ed | 80 | 20 | 100 |

**Note: 1.** Paper BVSD -309 Practical for External Marks 80 will be conducted by External Examiner appointed by University.

2. **Paper BVSD -310 Project work and Viva-Voce, t**he Project will be allocated at the end of the B.Voc(Software Development) V Semester.The Project Work should be compulsorily done as a live project under the supervision of the Departmental faculty of the concerned college and the software Industry and Comprehensive Viva-Voce will be conducted by External Examiner to be appointed by the University.

* Gen Ed- General Education & Voc Ed- Vocational Education