Rayat Shikshan Sanstha's

Yashavantrao Chavan Institute of Science, Satara (Autonomous)
Under
Karmveer Bhavurao Patil University, Satara

SYLLABUS FOR

B. Voc. (Software Development)

First Year
Semester I and II

To be implemented w. e. f. June 2021

B.Voc. I Syllabus

Preamble:

The University Grants Commission (UGC) has launched a scheme on skills development based higher education as part of college/university education, leading to Bachelor of Vocational (B.Voc.) Degree with multiple exits such as Diploma/Advanced Diploma under the NSQF. The B.Voc. Programme is focused on universities and colleges providing undergraduate studies which would also incorporate specific job roles along with broad based general education. This would enable the graduates completing B. Voc.to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge.

The proposed vocational Programme in Software Development will be a judicious mix of skills, professional education related to Software Development and also appropriate content of general education. It is designed with the objective of equipping the students to cope with the emerging trends and challenges in the Software Development environment.

Programme Objectives of Course:

The students are expected to understand the concepts and recent developments in the subject area.

1. It is expected to inspire and boost interest of the students in Software Development Process.

2. Practical and theory framed under skill development and to understand the concepts in Industry.

3. To provide current and practical base knowledge to students in this area.

4. To provide more job-based training so student can achieve the goal.

Program Specific Outcomes:

After successful completion of B. Voc Software Development Course student will be able to:

1. Understand the concept and working of Software Industry.

2. Learn, design and perform programs and projects in lab as per the concepts learn in course.

3. Acquire knowledge about recent technologies in software development field.

4. Resolve problems specific to this field.

5. Perform jobs or self-career in various fields like Software/Website Development, Graphic Designing

B.Voc. Course Structure

B.Voc. I Semester 1

No.	Title	Credit	Hrs/Week	No.	Title	Credit	Hrs/Week
General Education				**Skill Component**			
EN1111	Listening and Speaking Skill	4	4	VS 313	Advanced Operating System	4	4
VS 311	Aptitude & Logical reasoning	4	4	VS 314	C Programming	4	4
VS 312	Programming Principles	4	4	VS 315	Word Processing & Image editing	4	4
				VS 316	Lab:C programming	2	3
				VS 317	Lab: Photoshop	2	3
				VS 318	Lab: Advanced Operating System	2	3
				SEC-I	Basics of Vector Designer	1	2
				VBC	Ethics and Values for Holistic Development.	1	2
	Total	**12**	**12**		**Total**	**20**	**20**

B.Voc. I Semester II

No.	Title	Credit	Hrs/Week	No.	Title	Credit	Hrs/Week
General Education				**Skill Component**			
EN1211	Writing and Presentation skills	4	4	VS 322	Web Designing (HTML, CSS)	4	4
VS 321	Network and Internet Applications	4	4	VS 323	Database Management System	4	4
MM1131.9	Mathematics I	4	4	VS 324	Object Oriented Programming in 'C++'	4	4
				VS 325	Lab: Programming in C++	2	3
				VS 326	Lab: Web Designing (HTML/CSS)	2	3
				VS 327	Lab: DBMS	2	3
				SEC-II	Advance Vector Art Designer	2	3
	Total	**12**	**12**		**Total**	**20**	**20**

EN 1111: LISTENING AND SPEAKING SKILLS   (60)

Course Objectives: Students will be able to….

1. Listen to lectures, public announcements and news on TV and radio.
2. Engage in telephonic conversation
3. Communicate effectively and accurately in English.
4. Use spoken language for various purposes.

Unit	Topics	No of Hours Per Unit
Unit I	**Introduction:** Meaning, definition, functions, objectives and importance of statistics. - Distrust of statistics-Collection, classification, tabulation and presentation of data. Measures of central tendency and Measures of dispersion - relevance and awillpplicability of each technique in business	15
Unit II	**Listening Skills:** Difference between listening and hearing – active listening –barriers to listening – academic listening - listening for details - listening and note-taking - listening for sound contents of videos - listening to talks and descriptions - listening for meaning - listening to announcements - listening to news programs.	15
Unit III	**Speaking Skills:** Interactive nature of communication - importance of context - formal and informal - set expressions in different situations –greeting – introducing - making requests - asking for / giving permission - giving instructions and directions – agreeing / disagreeing – seeking and giving advice - inviting and apologizing telephonic skills – conversational manners.	15
Unit IV	**Dialogue Practice :** Students will be given ample practice in dialogue, using core and supplementary materials.	15

Course Outcome:

Students will be able to….

1. Understand Phonemic symbols – consonants – vowels
2. Understand strong and weak forms- intonation.
3. Understand Interactive nature of communication
4. Understand Difference between listening and hearing
5. Understand expressions in different situations

References:

1. Marks, Jonathan. English Pronunciation in Use. New Delhi: CUP,2007.
2. Lynch, Tony. Study Listening. New Delhi: CUP,2008.
3. Kenneth, Anderson, Tony Lynch, Joan MacLean. Study Speaking. New Delhi: CUP,2008.
4. Jones, Daniel. English Pronouncing Dictionary 17th Edition. New Delhi: CUP, 2009

VS 311: APTITUDE AND LOGICAL REASONING   (60)

Course Objectives: Students will be able to….

1. Interpret different data.
2. Establish relationship between numbers.
3. Solve different logical problems.
4. Understand Relationship concept.

Unit	Topics	No of Hours Per Unit
Unit I	**Data sufficiency:** Data sufficiency, Measurement, Time and distance, Arithmetic, Relationship between numbers	15
Unit II	**Basic mathematical relations and formula:** Basic mathematical relations and formula, Computation, Data interpretation.	15
Unit III	**Differences:** Differences, Discrimination, Decision-making, Judgment, Problem-solving, Analogies, Analysis	15
Unit IV	**Arithmetic reasoning:** Arithmetic reasoning, Relationship concept, Arithmetic number series, Similarities, Verbal and figure classification, Space visualization, Observation	15

Course Outcome:

Students should be able to….

1. Understand Data sufficiency, Measurement
2. Understand Arithmetic, Relationship between numbers
3. Understand Basic mathematical relations and formula
4. Understand Make Relationship concept, Arithmetic number series

References:

1. B.S. Sijwali, Indu Sijwali, A New Approach to REASONING Verbal & Non-Verbal Paperback, 1 January 2014, Arihant Publications, Second Edition
2. R.S. Aggarwal, Modern Approach to Logical Reasoning, 1 January 2014, S Chand publishing, Second Edition
3. Arun Sharma, How to Prepare for Logical Reasoning,30 May 2019, Mc Graw Hill Education, Fifth Edition

VS 312: PROGRAMMING PRINCIPLE   (60)

Course Objectives: Students will be able to….

1. Explain problem solving steps
2. Develop algorithm for different problems
3. Interpret flow chart
4. Analyze algorithms

Unit	Topics	No of Hours Per Unit
Unit I	**Problem Solving and the Computer:** Problem Definition, Solution Design, Solution Refinement, Testing Strategy Development, Program Coding and Testing, Documentation Completion, Program Maintenance.	15
Unit II	**Software and Types of Software:** Software and Types of Software, Programming Languages-Machine Language, Assembly Language, High Level Language, Object Oriented Language and its features.	15

Unit III	**Algorithms and Their Representations:** Algorithms and Their Representations, Flow charts, Pseudo code, Types of Programming, Languages, Structured Programming, Different approaches of Programming: Top-down and Bottom-up, Life Cycles Stages of Programming, Features of a good computer program.	15
Unit IV	**Areas of algorithm study:** Areas of algorithm study performance analysis – space complexity, time complexity, asymptotic notations.	15

Course Outcome:
  Students should be able to….

   1. Differentiate Problem Definition, Solution Design,

   2. Understand Program Coding and Testing

   3. Understand Algorithms and Their Representations

   4. Understand, Life Cycles Stages of Programming

References:

   1. Pradeep K. Sinha, Priti Sinha, Computer Fundamentals, 2021, BPB Publications, 8th Edition

   2. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, Computer Algorithms/C++, 2019, The Orient Blackswan, 2nd Edition

VS 313: ADVANCED OPERATING SYSTEM   (72)

Course Objectives: Students will be able to….

   1. Understand the basic terminology in the field of operating system.

   2. Impart functional knowledge about operating system operations and concepts

   3. Understand virtualization, memory virtualization, I/O virtualization

   4. Understand MS-DOS file system and UNIX file system.

Unit	Topics	No of Hours Per Unit
Unit I	**Introduction:** Operating system, History of operating system, computer	18

	hardware, different operating systems, operating system concepts, system calls, operating system structure. Processes and Threads: Processes, threads, inter process communication, scheduling, IPC problems.	
Unit II	**Memory Management, Input-Output:** No memory abstraction, memory abstraction: address spaces, virtual memory, and page replacement algorithms, design issues for paging systems, implementation issues, and segmentation. File Systems: Files, directories, file system implementation, file-system management and optimization, MS-DOS file system, UNIX V7 file system, CD ROM file system. Principles of I/O hardware, Principles of I/O software, I/O software layers, disks, clocks, user interfaces: keyboard, mouse, monitor.	**18**
Unit III	**Virtualization and Cloud:** History, requirements for virtualization, type 1 and 2 hypervisors, techniques for efficient virtualization, hypervisor microkernels, memory virtualization, I/O virtualization, Virtual appliances, virtual machines on multicore CPUs, Clouds. **Multiple Processor Systems** Multiprocessors, multicomputer, distributed 12 systems.	**18**
Unit IV	**Case Study on LINUX and ANDROID:** History of Unix and Linux, Linux Overview, Processes in Linux, Memory management in Linux, I/O in Linux, Linux file system, security in Linux. Android **Case Study on Windows:** History of windows through Windows 10, programming windows, system structure, processes and threads in windows, memory management, caching in windows, I/O in windows, Windows NT file system, Windows power management, Security in windows.	**18**

Course Outcome: Students should be able to….

1. Understand CPU scheduling, storage.

2. Understand Multiprocessing operating system and distributed operating system.

3. Analyze different types of memory management in operating system.

4. Apply various commands of Command prompt

5. Understand various commands of LINUX operating system

References:

1. Modern Operating Systems Andrew S. Tanenbaum, Herbert Bos Pearson 4th 2014

2. Operating Systems – Internals and Design Principles Willaim Stallings Pearson 8th 2009

3. Peter Norton, Introduction to Computers, McGrawhill, Seventh edition, 1 July 2017, 6th Edition

VS 314: C PROGRAMMING (72)

Course Objectives: Students will be able to….

1. Understand algorithmic thinking and algorithmic representations
2. Apply Basic data types and control structures in C.
3. Understand structured programming concepts
4. Able to use standard library functions in C language

Unit	Topics	No of Hours Per Unit
Unit I	**Introduction to programming:** Character set, Variables and Constants, Rules for naming the Variables/Identifiers; Basic data types of C, int, char, float, double; storage capacity – range of all the data types; Storage classes;	18
Unit II	**Basic Elements:** Operators and Expressions: Assignment Operator, Arithmetic Operator and Arithmetic expression, Relational Operator and Relational exp., Logical Operator and how it is used in condition, Precedence of Operators, simple I/O statements, Control structures, if, if else, switch-case, for, while, do-while, break, continue.	18
Unit III	**Arrays:** Arrays, declaration, initialization and processing, Defining simple arrays, multi-dimensional arrays, Strings: Strings Manipulation, Arrays of Strings.	18
Unit IV	**Functions and Pointers:** Functions: Definition, return values & their types, function call, recursion, passing Arrays to Functions, Storage classes, accessing the address of variable, declaring & initializing pointer variables, accessing	18

	variables through pointers, void pointers. File management in C: Introduction, Defining & Opening a file, closing a file, Input/Output operations on file, Random Access to files.	

Course Outcome:
Students should be able to….

1. Understand Basic data types of C.
2. Apply with operators and expressions.
3. Analyze working of Control structures
4. Understand concept of modular programming.
5. Understand and work with Array & its types.

References:

1. Yashwant Kanetkar, Let Us C, BPB Publications, 2017,16th Edition
2. Ashok N. Kamthene, Programming in C, Pearson Education, 2011, Second edition
3. E.Balaguruswamy, Programming in ANSI C, McGrawhill, 2010,fifth Edition

VS 315: WORD PROCESSING AND IMAGE EDITING   (72)

Course Objectives: Students will be able to….

1. Understand office document
2. Create Power Point presentation
3. Apply various effects and Edit images
4. Apply various tools of Photoshop

Unit	Topics	No of Hours Per Unit
Unit I	**Word processing:** Word processing concepts, Editing, Formatting Text, Table Manipulation, Indexing, Mail merge, Documentation, Inserting Word Art, Inserting Picture and clip Arts, Auto formatting, Tools, Macros	18
Unit II	**Power Point:** Beginning a presentation, Templates and Slide Master, Drawing Tools, ClipArt and WordArt, Organization Charts, Graph, Output and Presentation Options, Integrating with Animation and Multimedia packages.	18

Unit III	**Flash:**	18
	Introduction, Drawing, Working with Color, Using Imported Artwork, Adding Sound, Working with Objects, Using Layers, Using Type, Using Symbols and Instances, Creating Animation, creating interactive movies, Creating Printable movies, Publishing and Exporting.	
Unit IV	**Photoshop:**	18
	Getting image into Photoshop, Selecting, Transforming and Retouching, Drawing, Painting, Applying Filters for special effects, Designing Web pages, Creating Rollovers and Animations, Preparing Graphics for the Web, Saving and exporting images.	

Course Outcome: Students should be able to….

1. Applying word Editing, Formatting,

2. Perform Mail merge, Documentation

3. Create presentation, Templates and Slide Master.

4. Use to Drawing Tools, ClipArt and WordArt.

5. Getting image into Photoshop, Selecting, Transforming and Retouching

6. Designing Web pages, Creating Rollovers and Animation

References:
1. Exploring Microsoft Word 2003 Comprehensive, Robert T.Grauer and Maryann Barber, Pearson,2013, 2nd edition

2. Microsoft® Office PowerPoint® 2003, Online Training Solutions Inc, Microsoft Press, October 1, 2003,2nd Edition

3. Adobe Flash CS3 Professional Hands-On Training, Todd Perkins, Peachpit Press , 4 September 2007,1st Edition

SEC-I: BASICS OF VECTOR DESIGNER   (15)

Course Objectives: Students will be able to….
1. Students learn to communicate through their visual solutions to the projects.

2. Students will learn to solve visual problems using vector art, giving them an important additional skill when they become entry-level designers.

3. Additionally, they learn to exchange ideas, approximating a real-world working atmosphere.

Unit	Topics	No of Hours Per Unit
Unit I	**Role and Responsibilities** Contributing to team efforts by accomplishing tasks as needed, communicating with clients about layout and design, creating a wide range of graphics and layouts for product illustrations, company logos, and websites with software such as photoshop, reviewing final layouts and suggesting improvements when necessary.	18
Unit II	**Technical Knowledge** how to bring together lines, color, shape, space, texture, typography, scale, dominance and emphasis, and harmony to create visually appealing and well-structured designs, many different design software	18

Course Outcome: Students should be able to….
1. Identify the capabilities and functions of drawing, transformation and shape tools in Adobe Illustrator.
2. Apply conceptual planning techniques in the development of graphic design pieces
3. Analyze production problems encountered and recommend solutions

References:
1. Rafiq Elmansy, Illustrator Foundations: The Art of Vector Graphics, Design and Illustration in Illustrator, First published 2013
2. Dena Wilson and Peter Lourekas with Rob Schwartz,Learn Adobe Illustrator CC for Graphic Design and Illustration, Adobe Press books are published by Peachpit, a division of Pearson Education

SEC-I: LAB: Basics of Vector Designer   (15)

Course Objectives: Students will be able to….
1. Students learn to communicate through their visual solutions to the projects.
2. Students will learn to solve visual problems using vector art, giving them an important additional skill when they become entry-level designers.
3. Additionally, they learn to exchange ideas, approximating a real-world working atmosphere.

Practical:

1. Draw the Effective Communication Strategies for Designers.

2. What is Product Design Elements?

3. What is the Process of Product Design?

4. How To Convince the Client That Your Design Is Perfect?

5. Creating your own vector art in any software applications.

Course Outcome: Students will be able to….

1. Identify the capabilities and functions of drawing, transformation and shape tools in Adobe Illustrator.

2. Apply conceptual planning techniques in the development of graphic design pieces

3. Analyze production problems encountered and recommend solutions

VS 316: C PROGRAMMING LAB   (36)

Course Objectives: Students will be able to….

1. Understand algorithmic thinking and algorithmic representations

2. Apply Basic data types and control structures in C.

3. Understand structured programming concepts

4. Able to use standard library functions in C language

Practical:

1. Write a C program to find if a given no. is prime or not

2. Write a C program to compute Fibonacci series

3. Write a C program to insert an element in one dimensional array at a given position

4. Write a C program to delete an element from one dimensional array

5. Write a C program to multiply a 3*3 matrix.

6. Write a C program to check if given string is palindrome or not.

7. Write a C program using function to find sum of two numbers with no argument & no return value

8. Write a C program to reverse the entered string from command line arguments

9. Write a C program to read name and marks of n number of students from and store them in a file. If the file previously exits, add the information to the file.

10. Write a C program to read name and marks of n number of students and store them in a file.

Course Outcome: Students should be able to….

1. Understand Basic data types of C.

2. Apply with operators and expressions.

3. Analyze working of Control structures

4. Understand concept of modular programming.

5. Understand and work with Array & its types.

VS 317: PHOTOSHOP LAB   (36)

Course Objectives: Students will be able to….

1. Prepare office document

2. Create PowerPoint presentation

3. Apply various effects and Edit images

4. Apply various tools of Photoshop

Practical:

1. Insert any Damage image & clear this image using various Healing tools.

2. How to Create Black and White Photo to Color Photo

3. Professional Logo Design in Adobe Photoshop

4. Tri Fold Brochure Design in Adobe Photoshop

5. Advertising Design in Adobe Photoshop

6. Background Change and Photo/Face Retouch

7. How to Blur Background and Retouching a Photo

8.   Insert any Damage image & clear this image using various Healing tools.

9. How to Make Water color Photo Effect

10. 3D silver text effect 6. How to Make 3D Icon

Course Outcome: Students should be able to….

1. Apply word Editing and Formatting,

2. Perform Mail merge, Documentation

3. Create presentation, Templates and Slide Master.

4. Know Drawing Tools, ClipArt and WordArt.

5. Get image into Photoshop, Selecting, Transforming and Retouching

6. Design Web pages, Creating Rollovers and Animation

VS 318: ADVANCED OPERATING SYSTEM LAB (36)

Course Objectives: Students will be able to….

1. Prepare virtual machine software.
2. Understand operating system operations.
3. Impart file system using command prompt.
4. Understand MS-DOS file system and UNIX file system.

Practical:

1. Installation of virtual operating system.
2. Installation of Linux operating system (RedHat / Ubuntu) on virtual machine.
3. Installation of Windows operating system on virtual machine.
4. Linux commands: Working with Directories:
   a) pwd, cd, absolute and relative paths, ls, mkdir, rmdir,
   b) file, touch, rm, cp. mv, rename, head, tail, cat, tac, more, less, strings, chmod.
5. Linux commands: Working with files:
   a) ps, top, kill, pkill, bg, fg,
   b) grep, locate, find, locate.
   c) Date, cal, uptime, w, whoami, finger, uname, man, df, du, free, whereis, which.
   d) Compression: tar, gzip.
6. Windows (DOS) Commands-1
   a) Date, time, prompt, md, cd, rd, path.
   b) Chkdsk, copy, xcopy, format, fidsk, cls, defrag, del, move.
7. Windows (DOS) Commands – 2
   a) Diskcomp, diskcopy, diskpart, doskey, echo
   b) Edit, fc, find, rename, set, type, ver
8. Working with Windows Desktop and utilities
   a) Notepad b) WordPad c) Paint d) Taskbar e) Adjusting display resolution
   f) Using the browsers g) Configuring simple networking h) Creating users and shares
9. Working with Linux Desktop and utilities
   a) The VI editor. b) Graphics c) Terminal d) Adjusting display resolution
   e) Using the browsers f) Configuring simple networking g) Creating users and shares
10. Installing utility software on Linux and Windows

Course Outcome: Students should be able to….

1. Create virtual operating system.
2. Create Multiprocessing operating system and distributed operating system.

3. Apply various commands of Command prompt in file system.

4. Apply various commands of LINUX and MS-DOS operating system.

SEMESTER -II

EN 1211:   WRITING AND PRESENTATION SKILL   (72)

Course Objectives: Students will be able to….

1. Understand the mechanism of general and academic writing.

2. Recognize the different modes of writing.

3. Improve their reference skills, take notes, refer and document data and materials.

4. Prepare and present seminar papers and project reports effectively.

SYLLABUS:

Unit	Topics	No of Hours Per Unit
Unit I	**Writing as a skill:** Writing as a skill – its importance – mechanism of writing – words and sentences - paragraph as a unit of structuring a whole text – combining different sources – functional use of writing – Personal, academic and business writing – creative use of writing.	**18**
Unit II	**Writing process:** Writing process - planning a text – finding materials - drafting – revising – editing - finalizing thedraft-computerasanaid–keyboardskills-wordprocessing-desktoppublishing.	**18**
Unit III	**Writing models:** Writing models – essay - précis - expansion of ideas – dialogue - letter writing – personal letters formal letters - CV – surveys – questionnaire - e-mail – fax - job application - report writing.	**18**
Unit IV	**Presentation as a skill:** Presentation as a skill - elements of presentation strategies – audience – objectives – medium	**18**

	– key ideas -structuring the material - organizing content - audio-visual aids – handouts - use of power point - clarity of presentation - non-verbal communication - seminar paper presentation and discussion.	

Course Outcome: student should be able to….

1. Know its importance – mechanism of writing,
2. combine different sources – functional use of writing
3. Understand elements of presentation strategies
4. Create seminar paper presentation and discussion

References:

1. Robert, Barraas. Students Must Write. London: Routledge,2006.
2. Bailey, Stephen. Academic Writing.Routledge,2006.
3. Hamp-Lyons, Liz, Ben Heasley. Study Writing.2nd Edition.CambridgeUtyPress,2008.
4. Ilona, Leki. Academic Writing.CUP,1998.
5. McCarter, Sam, Norman Whitby. Writing Skills.Macmillan India,2009.
6. Jay. Effective Presentation. New Delhi: Pearson,2009.

MM 1131.9: COMPUTATIONAL MATHEMATICS-I   (72)

Course Objectives: Students will be able to….

1. Solve differentiation problems.
2. Use hyperbolic function.
3. Have understanding of theory of numbers.
4. Develop solutions for complex numbers.

SYLLABUS:

Unit	Topics	No of Hours Per Unit
Unit I	**Review:** Review of basic differentiation, Differentiation of hyperbolic functions, derivatives of hyperbolic functions, inverse hyperbolic functions logarithmic differentiation, implicit differentiation, Lebnitz's	18

	theorem, Mean value theorem, Rolle's theorem, Lagrange's mean-value theorem, Maxima and minima.	
Unit II	**Differential equations:** Differential equations, General Concepts, Formulation and solution of differential equations, solution of higher order linear DEs. Partial Des, Laplace and Inverse Laplace transforms.	**18**
Unit III	**Theory of Numbers:** Theory of Numbers, prime numbers, Unique factorization theorem, Euclidean algorithm, congruence, Fermat's theorem, Wilson's theorem. .	**18**
Unit IV	**Complex Numbers:** Complex Numbers, Separation into real and imaginary parts, Complex mapping, Markov processes. Harmonic analysis and Fourier series, Linear Programming	**18**

Course Outcome: student should be able to….

1. Solve differentiation problems.
2. Use Lebnitz's theorem, Mean value theorem, Rolle 's Theorem on problems.
3. Understand General Concepts of differentiation.
4. Understand solution of higher order linear DEs. Partial Des, Laplace

References:

1. Erwin Kreyzig Advanced Engineering Mathematics, New Age International Pvt Ltd.,2018,6th Edition

2. Shanthi Narayan, Differential Calculus, S Chand &Company, 2017, Fifteenth Edition

3.ZafarAhsan, Differential Equations and their applications, Prentice Hall India Learning Private Limited, 2004, 2nd Edition.

4. Rudra Pratap, Getting Started with MATLAB, Oxford UniversityPress,2010, 6th Editi

VS 321: NETWORK AND INTERNET APPLICATIONS   (72)

Course Objectives: Students will be able to….

1. Explain different components for internet
2. Discuss different applications of it
3. Understand network protocols.

4. Access and understand Advanced WEB technologies.

SYLLABUS:

Unit	Topics	No of Hours Per Unit
Unit I	**Computer Network:** Computer Network Introduction, Uses of computer networks, Networks Hardware, LAN, MAN, WAN, Protocol hierarchies, OSI Model, TCP/IP reference model.	**18**
Unit II	**History of internet:** History of internet, The early years, The global Internet, A global information infrastructure, Review of packet switching and its relevance to the internet, Incompatible topologies, Routers, Dial-up access, Software to create a virtual network, Datagrams, IP address. Transmission Control Protocol (TCP): Software for reliable communication, Guaranteed delivery, Recovering the datagrams, Automatic retransmission, Brief discussion on distributed computing, Domain names, Names and IP address, TCP/IP, Flexibility, Reliability and efficiency.	**18**
Unit III	**Electronic mail:** Electronic mail, Mail box, Sending, Notification, Reading, how it works, Address format, E-mail to and from non-Internet sites, Access to service via E-mail, Speed and reliability, Impact and significance, Joining a mailing list. Bulletin Board Services (BBS), Network norms, News group, Selection, Subscription, Reading, submitting, article, How BBS woks File Transfer Protocol (FTP) Store/ retrieve, Binary and text files, How FTP works, Impact and significance, Remote login, how it works, TELNET	**18**
Unit IV	**Browsing:** Browsing the World Wide Web (WWW), How a browser works, Software used to access, URLs, Browser. WWW documents, Advanced WEB	**18**

	technologies, CGI, how it works. CGI and advertising Search engines, Browsing, Searching, and Search tool, Advanced search engines, Examples of search engines.	

Course Outcome: student should be able to….

1. Uses of computer networks.
2. Understand Networks Hardware
3. Learn History of internet.
4. Understand Working of virtual network, Datagrams, IP address and TCP
5. Browse WWW effectively.
6. Understand working of various Search engines

References:

1. Douglas E Comer, The Internet Book, Pearson Education ,2016,2nd Edition
2. Nancy Cadeno, The Internet Tool Kit, BPB Publications, 2015,4th Edition
3. Christian Crumlish, ABC's of the Internet, Sybex Inc.,U.S ,2017,2nd Edition

VS 322: WEB DESIGNING(HTML/CSS)   (72)

Course Objectives: Students will be able to….

1. Understand HTML, CSS, Java script
2. Impart necessary ability to choose the appropriate web tools/languages for creating state-of-the art web sites
3. Understand current trends and styles in web design and applications
4. Understand how tools woks like Dream viewer

SYLLABUS:

Unit	Topics	No of Hours Per Unit
Unit I	**Introduction to HTML:** Introduction to HTML Editors, Applications of HTML, Difference between HTML and XML, Basic HTML Elements, Headings HTML, Paragraphs, Image Formatting, Different Tags in HTML.	**18**
Unit II	**Commands in HTML and Form Design:** Table, Hyperlink creation in HTML, Web Page	**18**

	Designing using HTML, Comments in HTML, Button action HTML Forms, Form Elements in HTML, Input Types HTML, Input Attributes, Frame, Embed Script.	
Unit III	**CSS (Cascading style Sheets):** Class, Class attribute, ID, id attribute CSS linking, Inline CSS, Internal CSS, External CSS, CSS Colors, Fonts and Sizes, Text Formatting Styles, block-level element, inline element .	**18**
Unit IV	**Introduction to Dream viewer software:** Interface of Dream viewer, Toolbox Workspace, Web Page designing using Dream viewer, Applications, Advantages and Disadvantages of Dream viewer	**18**

Course Outcome: student should be able to….

1. Analyze Interface of Dream viewer.
2. Use Dream viewer to create HTML web pages
3. Use HTML Form elements.
4. Understand Input Attributes.

References:

1. The Complete Reference HTML and XHTML 4/e Thomas A. Powell , McGraw-Hill Education,2003, 4th Edition
2. HTML beginners guide, Wendy Willard, McGraw-Hill Education,2009,4th Edition
3. HTML black book, Steven Holzner , Coriolis Group,U.S,2000,1st Edition

VS 323: DATABASE MANAGMENT SYSTEM (72)

Course Objectives: Students will be able to...

1. Discuss Database management systems, databases and its applications

2. Familiarize the students with a good formal foundation on the relational model.

3. Outline the various systematic database design approaches

4. Describe the concepts of transactions and transaction processing and the issues, techniques related to concurrency and recovery manager.

5. Explore the File organizations, indexing and hashing mechanisms.

SYLLABUS:

Unit	Topics	No of Hours Per Unit
Unit I	**Introduction to Database System Concepts**: Database system, purpose of database system, view of data, relational databases, database architecture, transaction management.	18
Unit II	**Data Models, Database Design ,ER-Diagram and Unified Modeling Language** The importance of data models, Basic building blocks, Business rules, The evolution of data models, Degrees of data abstraction. Database design and ER Model: overview, ER-Model, Constraints, ER-Diagrams, ERD Issues, weak entity sets, Codd's rules, Relational Schemas, Introduction to UML **Relational database model:** Logical view of data, keys, integrity rules. Relational Database design: features of good relational database design, atomic domain and Normalization (1NF, 2NF, 3NF, BCNF).	18
Unit III	**Relational Algebra and Calculus, Constraints** Relational algebra: introduction, Selection and projection, set operations, renaming, Joins, Division, syntax, semantics. Operators, grouping and ungrouping, relational comparison. Calculus: Tuple relational calculus, Domain relational Calculus, calculus vs algebra, computational capabilities.	18
Unit IV	**Constraints, Views and SQL** Constraints, types of constrains, Integrity constraints, Views: Introduction to views, data independence, security, updates on views, comparison between tables and views SQL: data definition, aggregate function, Null Values, nested sub queries, Joined relations. Triggers. queries, Joined relations. Triggers.	18

Course Outcome: student should be able to….

1. Create Model Entity-Relationship diagrams for enterprise level databases

2. Formulate Queries using SQL and Relational Formal Query Languages

3. Apply different normal forms to design the Database

4. Summarize concurrency control protocols and recovery algorithms

5. Identify suitable Indices and Hashing mechanisms for effective storage and retrieval of Data

References:

1. A Silberschatz, H Korth, S Sudarshan, "Database System and Concepts", 2014, fifth Edition

McGraw-Hill, Rob, Coronel, "Database Systems", Seventh Edition, Cengage Learning

2. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts,

Sixth Edition, Tata McGraw-Hill 2006.

3. Raghu Rama Kirshna, Johannes Gchrke, Database Management System, Third

Edition, TATA MC Graw Hill, 2003.

4. C J Date, AKannan, S Swamynathan, An Introduction to Database Systems, Eigth Edition Pearson 2006

VS 324: OBJECT ORIENTED PROGRAMMING C++ (72)

Course Objectives: Students will be able to….

1. Identify importance of object-oriented programming and difference between structured oriented and object-oriented programming features.

2. Able to make use of objects and classes for developing programs.

3. Able to use various object-oriented concepts to solve different problems

SYLLABUS:

Unit	Topics	No of Hours Per Unit
Unit I	**Introduction to object-oriented programming:** Basic concepts of OOPS and Benefits of OOPS. Classes and Objects: Specifying a Class, Creating Objects, Accessing Class members, defining member function, Outside Member Functions as inline, Accessing Member Functions within the class, Static data member, Array of objects, friendly function. Access Specifiers: Private, Protected and Public Members.	18
Unit II	**Constructors and Destructors:** Introduction, Parameterized Constructors, Constructor Overloading, Constructors with Default Arguments, Copy Constructor, Dynamic Constructor, Destructor. Operator Overloading: Definition, Overloadable Operators, Overloading Unary Operator, Overloading Binary Operator, Rules for Operators Overloading	18
Unit III	**Concept of Inheritance:** Defining derived classes, Single, Multilevel, Multiple, Hierarchical, Hybrid Inheritance, virtual base class, Abstract classes. Introduction to dynamic objects, Pointers to Objects, this Pointer, Creating and Deleting Dynamic Objects, New and Delete operators.	18
Unit IV	**Exception Handling:** Exception Handling Model, List of Exceptions, Handling Uncaught Exceptions, Fault Tolerant Design Techniques, Memory Allocation Failure Exception, Rules for Handling Exception Successfully.	18

Course Outcome: student should be able to….

1. Create simple programs using classes and objects in C++.

2. Implement Object Oriented Programming Concepts in C++.

3. Develop applications using stream I/O and file I/O.

4. Implement simple graphical user interfaces.

5. Implement Object Oriented Programs using templates and exceptional handling concepts.

References:

1. Bjarne Stroustrup ,The C++ Programming Language , Addison-Wesley Professional,2013,4th Edition

2. E. Balagurusamy ,Object Oriented Programming with C++ , McGraw Hill ,2020,8th Edition

3. Ashok N. Kamthane, Object oriented Programming with ANSI & Turbo C++, Pearso,2016,6th Edition

SEC-II: VECTOR ART DESIGNER   (20)

Course Objectives: Students will be able to….

1. Design and create graphic design logos and more.

2. Simple and easy to use application.

3. Equipped with modern tools and features.

4. Fast and improve processing.

5. Supports a wide range of image formats.

6. Export options for high-quality output.

7. Vector-based designs.

Unit	Topics
Unit I	**Interface** Workspace basics, customizing the workspace, Tools, Brushes, Transparency and blending modes
Unit II	**Color &Painting** Gradient panel and Gradient tool overview, about color, selecting colors, Using and creating swatches, Color groups, adjusting colors About painting

Unit III	**Layers**
	About layers, Locking Hiding, and deleting objects, duplicating objects, transforming objects, Scaling Shearing and distorting objects, reshape using envelopes
Unit IV	**Effects & output** Combining objects, cutting and dividing objects, working with effects, creating animations Setting up documents for printing.

Course Outcome: Students should be able to….

1. Understand the elements that make up the Illustrator workspace.

2. Draw basic shapes using the shape tools.

3. Understand color and apply color to object fills and strokes

4. Explore creativity with effects and graphic styles

References:

3. Rafiq Elmansy, Illustrator Foundations: The Art of Vector Graphics, Design and Illustration in Illustrator, First published 2013

4. Dena Wilson and Peter Lourekas with Rob Schwartz,Learn Adobe Illustrator CC for Graphic Design and Illustration, Adobe Press books are published by Peachpit, a division of Pearson Education

SEC-II: LAB: Vector Art Designer   (20)

Course Objectives: Students will be able to….

4. Learn to communicate through their visual solutions to the projects.

5. Learn to solve visual problems using vector art, giving them an important additional skill when they become entry-level designers.

6. Learn to exchange ideas, approximating a real-world working atmosphere.

Practical:

1. Letter Logo Design in Adobe illustrator

2. How to Curve & Warp Text in Adobe illustrator

3. Flat Design Potted Plants in Adobe illustrator

4. Creating Calligraphy by using Adobe Illustrator.

5. Create a wrist watch vector illustration in adobe Illustrator.

6. Working with flat graphics to perspective in Adobe Illustrator.

7. How to Create Business Card in Adobe illustrator

8. Banner Design in Adobe illustrator.

9. How to Create Professional Business Tri-fold Brochure Design in Adobe Illustrator

10. Wedding Invitation Card Design in Adobe Illustrator

Course Outcome: Students should be able to….
1. Understand the elements that make up the Illustrator workspace.

2. Draw basic shapes using the shape tools.

3. Understand color and apply color to object fills and strokes

4. Explore creativity with effects and graphic styles

VS 325: Lab: Programming in C++   (36)

Course Objectives: Students will be able to….

1. Identify importance of object-oriented programming and difference between structured oriented and object-oriented programming features.

2. Make use of objects and classes for developing programs.

3. Use various object-oriented concepts to solve different problems

Practical:

1. Write a C++ Program to display Names, Roll No., and grades of 3 students who have appeared in the examination. Declare the class of name, Roll No. and grade. Create an array of class objects. Read and display the contents of the array.

2. Write a C++ program to declare Struct. Initialize and display contents of member variables.

3. Write a C++ program to declare a class. Declare pointer to class. Initialize and display the contents of the class member.

4. Given that an EMPLOYEE class contains following members: data members: Employee number, Employee name, Basic, DA, IT, Net Salary and print data members.

5. Write a C++ program to read the data of N employee and compute Net salary of each employee (DA=52% of Basic and Income Tax (IT) =30% of the gross salary).

6. Write a C++ to illustrate the concepts of console I/O operations.

7. Write a C++ program to use scope resolution operator. Display the various values of the same variables declared at different scope levels.

8. Write a C++ program to allocate memory using new operator.

9. Write a C++ program to create multilevel inheritance. (Hint: Classes A1, A2, A3)

10. Write a C++ program to create an array of pointers. Invoke functions using array objects.

11. Write a C++ program to use pointer for both base and derived classes and call the member function. Use Virtual keyword.

Course Outcome: Students should be able to….

1. Create simple programs using classes and objects in C++.

2. Implement Object Oriented Programming Concepts in C++.

3. Develop applications using stream I/O and file I/O.

4. Implement simple graphical user interfaces.

5. Implement Object Oriented Programs using templates and exceptional handling concepts.

VS 326: Lab: Web Designing (HTML/CSS)   (36)

Course Objectives: Students will be able to….
1. Understand HTML, CSS, Java script

2. Impart necessary ability to choose the appropriate web tools/languages for creating state-of-the art web sites

3. Understand current trends and styles in web design and applications

4. Understand how tools woks like Dream viewer

Practical:
1. Practicing basic HTML tags, text tags test styles, paragraph styles, headings, lists

2. Tables in HTML, Frames in HTML, nested frames, Link and Anchor Tags

3. Including graphics, video and sound in web pages, including Java applets

4. Layers & Image Maps

5. Creating animated Gifs

6. Cascading Style sheets

7. Creating and browsing XML database

8. HTML forms and Fields

9. Exercises covering basic introduction to JavaScript

10: Development of a web site involving a variety of tools practiced above

Course Outcome: Students should be able to….

1. Analyze Interface of Dream viewer.
2. Use Dream viewer to create HTML web pages
3. Use HTML Form elements.
4. Understand Input Attributes.

VS 327: Lab: DBMS   (36)

Course Objectives: Students will be able to….

1. Discuss Database management systems, databases and its applications

2. Familiarize the students with a good formal foundation on the relational model.

3. Outline the various systematic database design approaches

4. Describe the concepts of transactions and transaction processing and the issues, techniques related to concurrency and recovery manager.

5. Explore the File organizations, indexing and hashing mechanisms.

Practical:

1. Design a Database and create required tables. For e.g. Bank, College Database
2. Apply the constraints like Primary Key, Foreign key, NOT NULL to the tables.
3. Write a SQL statement for implementing ALTER,UPDATE and DELETE
4. Write the queries to implement the joins
5. Write the query for implementing the following functions:
   MAX(),MIN(),AVG(),COUNT()
6. Write the query to implement the concept of Integrity constrains
7. Write the query to create the views
8. Perform the queries for triggers
9. Perform the following operation for demonstrating the insertion, updating and deletion using the referential integrity constraints 1
10. Write the query for creating the users and their role.

Course Outcome: Students should be able to….

1. Model Entity-Relationship diagrams for enterprise level databases

2. Formulate Queries using SQL and Relational Formal Query Languages

3. Apply different normal forms to design the Database

4. Summarize concurrency control protocols and recovery algorithms

5. Identify suitable Indices and Hashing mechanisms for effective storage and retrieval of Data