Savitribai Phule Pune University
Faculty of Science & Technology

Curriculum

For
Bachelor of Vocational (Engg)
First Year Software Development

(Choice Based Credit System) (2020 Course)

(With Effect from Academic Year 2020-21)

B. Voc Software Development Syllabus for First Year

Structure for Semester-I												
Course Code	**Course Name**	**Teaching Scheme (Hours/Week)**		**Examination Scheme and Marks**						**Credits**		
		Theory	**Pract.**	**ISE**	**ESE**	**TW**	**PR**	**OR**	**Total**	**TH**	**PR**	**Total**
	IT Foundation and Programming Concepts	03		50	50				100	03		03
	Web Designing	03		50	50				100	03		03
	Programming in C	03		50	50				100	03		03
	Operating System (OS)	03		50	50				100	03		03
	Web Designing Lab		02				50	--	50		1.5	1.5
	C Programming Lab		02				50	--	50	--	1.5	1.5
	On Job Training		18					100	100		15	15
Total		12	**22**	**200**	**200**		**100**	**100**	**600**	**12**	**18**	**30**

Structure for Semester-II												
Course Code	**Course Name**	**Teaching Scheme (Hours/Week)**		**Examination Scheme and Marks**						**Credits**		
		Th	**Pract.**	**ISE**	**ESE**	**TW**	**PR**	**OR**	**Total**	**TH**	**PR**	**Total**
	Data Structures	03		50	50				100	03		03
	Concepts of Data Mining	03		50	50				100	03		03
	OOPs with Java	03		50	50				100	03		03
	Multimedia Tools & Applications	03		50	50				100	03		03
	Data Structure Lab		03				100	100	200		6	6
	Java Lab		03									
	On Job Training *		18					100	100		15	15
Total		**12**	**24**	**150**	**150**		**100**	**200**	**600**	**09**	**21**	**30**

*On Job Training should be carried out in any one subject per semester as per NSDC Guide lines for following Skill Sets:

1. Technical Writer (SSC/Q0505)
2. Infrastructure Engineer (SSC/Q0801)
3. Associate – CRM (SSC/Q2202)
4. Web Developer (SSC/Q0503)
5. Test Engineer (SSC/Q1301)

B. Voc Software Development syllabus for Second Year

Structure for Semester-I												
Course Code	**Course Name**	**Teaching Scheme (Hrs/Wk)**		**Examination Scheme and Marks**						**Credits**		
		Th	**Pra**	**ISE**	**ESE**	**TW**	**PR**	**OR**	**Total**	**TH**	**PR**	**Total**
	Linux Operating System – Operations and Management	03		50	50				100	03		03
	Software Engineering	03		50	50				100	03		03
	Web Development using PHP	03		50	50				100	03		03
	Windows Development Fundamental	03		50	50				100	03		03
	Web Development using PHP Lab		02				50	--	50		1.5	1.5
	Window Development Fundamentals Lab		02				50	--	50	--	1.5	1.5
	On Job Training		18					100	100		15	15
Total		12	**22**	**200**	**200**		**100**	**100**	**600**	**12**	**18**	**30**

Structure for Semester-II												
Course Code	**Course Name**	**Teaching Scheme (Hours/Week)**		**Examination Scheme and Marks**						**Credits**		
		Theory	**Prac**	**ISE**	**ESE**	**TW**	**PR**	**OR**	**Total**	**TH**	**PR**	**Total**
	Software Testing and Project Management	03		50	50				100	03		03
	Android Application Development	03		50	50				100	03		03
	Window Configuration and Server Administration	03		50	50				100	03		03
	Management Information Systems	03		50	50				100	03		03
	Android Application Development Lab		02				50	--	50		1.5	1.5
	MIS Lab		02				50		50		1.5	1.5
	On Job Training		18					100	100		15	15
Total		12	**22**	**200**	**100**		**100**	**100**	**600**	**12**	**18**	**30**

*On Job Training should be carried out in any one subject per semester as per NSDC Guide lines for following Skill Sets:

1. Junior Data Associate (SSC/Q0401)
2. IP Executive (SSC/Q6201)
3. Security Analyst (SSC/Q0901)
4. QA Engineer (SSC/Q1302)
5. Software Engineer (SSC/Q4601)

B. Voc Software Development Syllabus for Third Year

Structure for Semester-I												
Course Code	**Course Name**	**Teaching Scheme (Hours/Week)**		**Examination Scheme and Marks**						**Credits**		
		Theory	**Pract.**	**ISE**	**ESE**	**TW**	**PR**	**OR**	**Total**	**TH**	**PR**	**Total**
	Technology Trends in IT	03		50	50				100	03		03
	Window Mobile Application Development	03		50	50				100	03		03
	Introduction to Python Programming	03		50	50				100	03		03
	Introduction to Microprocessors	03		50	50				100	03		03
	Window Mobile Application Development Lab		02				50	--	50		1.5	1.5
	Python Programming Lab		02				50	--	50	--	1.5	1.5
	On Job Training		18					100	100		15	15
Total		12	**22**	**200**	**200**		**100**	**100**	**600**	**12**	**18**	**30**
Structure for Semester-II												
Course Code	**Course Name**	**Teaching Scheme (Hours/Week)**		**Examination Scheme and Marks**						**Credits**		
		Th	**Pract.**	**ISE**	**ESE**	**TW**	**PR**	**OR**	**Total**	**TH**	**PR**	**Total**
	Introduction to AI	03		50	50				100	03		03
	e-Commerce	03		50	50				100	03		
	Computer Network Security	03		50	50				100	03		
	Introduction to Biometrics	03		50	50				100	03		
	AI Lab		02				50		50		1.5	
	Computer Network Security Lab		02				50	--	50	--	1.5	12
	On Job Training		18					100	100		15	15
Total		**03**	**22**	**200**	**200**		**100**	**100**	**600**	**12**	**18**	**30**

*On Job Training should be carried out in any one subject per semester as per NSDC Guide lines for following Skill Sets:

1. Management Trainee (SSC/Q6301)
2. Associate - Transactional F&A (SSC/Q2301)
3. Consultant Network Security (SSC/Q0917)
4. Master Trainer for Software Developer (SSC/Q0509)
5. Hardware Engineer (SSC/Q4701)

Semester

I

Syllabus

Subject Name: IT foundation and IT tools		
Course Code :BVSWC101	**Semester: I**	
Weekly Teaching Hours: TH: 03 Tut: 00	**Scheme of Marking TH: 40 IA: 10 Total: 50**	
TH Exam Duration: 03 Hours	**Scheme of Marking PR: --**	
Credit :03		

Course Objective :

1. To learn and understand basic input output devices.
2. To learn and understand basic digital design techniques
3. To know the difference between different types of network
4. To understand different addressing techniques used in network

Course Outcome:

1. Spectacle an awareness and apply knowledge of number systems, codes, Boolean algebra
2. Use logic function representation for simplification with K-Maps
3. To know the difference between different types of network.
4.. To know Responsibilities, services offered and protocol used at each layer of network

	Content	Hours
Unit – I	**1.0 Computer System Characteristics**	06
	A Brief History of Computers, Von Neumann Architecture, Harvard Architecture Basic structure, ALU, memory, CPU, I/O devices. Development of computers. Classification of computers:(Micro, mini frame, super computer, pc, server, workstations) **Input Devices and Output Devices** Keyboard, Direct Entry: Card readers, scanning devices (BAR CODE, OMR, MICR),Voice input devices, Light pen, Mouse, Touch Screen, Digitizer, scanner. CRT, LCD/TFT, Dot matrix printer, Inkjet printer, Drum plotter, Flatbed plotter Data Representation: BIT, BYTE, WORD, ASCII, EBCDIC, BCD Code.	
Unit – II	**2.0 Fundamentals of Digital Electronics**	08
	Introduction to Number system: Binary, Octal, Decimal and Hexadecimal. Number Systems and Boolean Algebra Basics of Analog and Digital. Boolean algebra, De-Morgan's law, Truth tables. Conversation from one number system to another number system. Introduction to Basic Gates. Signed Binary number representation and Arithmetic's Logical Circuits Logic gates: AND, OR, NOT, NOR, NAND, XOR, XNOR. Combinational Circuits: (i) Arithmetic Circuits: Half adders, Full adders , Subtractors, (ii) Data Processing Circuits: Encoders, Decoders, Multiplexers, DeMultiplexers,	
Unit – III	**3.0 Integrated Circuits and Memories**	06
	Introduction to IC's, Importance and applications, Linear and Digital IC's, Introduction to SSI, MSI, LSI and VLSI (Terminology & Definitions). RAM, ROM, PROM, EPROM, EEPROM. - Base memory, extended memory, expanded memory, Cache memory - Storage devices Tape, FDD, HDD, CDROM, Pen Drive.	
Unit – IV	**4.0 IT Tools and Troubleshooting: Hardware, Software and Networking**	05

	Networking and Internet. • Network Safety concerns. • Network Security tools and services. • Cyber Security. • Safe practices on Social networking. □ Commonly encountered problems. □ (Monitor: No display, KB/Mouse not responding, monitor giving beeps, printer not responding, check for virus, Delete temporary files if system is slow, adjust mouse speed).	
Unit – V	**5.0 Computer Networks**	08
	Introduction to computer Network - Communication: An Essential Part of Our Lives, Communicating in a Network-Centric World, Network as a Platform, Architecture of the Internet, Trends in Networking Communicating over the Network - Platform for Communications, LANs, WANs, MANs and Internetworks, Protocols, Using Layered Models, Network Addressing(IP, MAC,DOMAIN) Internet connections: ISP, Dial-up, cable modem, WLL, DSL, leased line Wireless and Wi-Fi connectivity ; email, email software features (send receive, filter, attach, forward, copy, blind copy);	
Unit – VI	**6.0 Study of Layers**	12
	Application Layer Functionality and Protocols - Applications: The Interface Between the Networks, Making Provisions for Applications and Services, Application Layer Protocols and Services Examples OSI Transport Layer - Roles of the Transport Layer, IPv4 Addresses, TCP: Communicating with Reliability, UDP: Communicating with Low Overhead OSI Network Layer - IPv4, Networks: Dividing Hosts into Groups, Routing, How Data Packets Are Handled, Routing Processes Addressing the Network- IPv4 Addresses for Different Purposes, Assigning Addresses, Calculating Addresses, Testing the Network Layer OSI Data Link Layer - Data Link Layer, MAC Techniques, MAC Addressing and Framing Data	

Text Books		
Name of Authors	**Title of the Book**	**Publisher**
R.P. Jain	Modern Digital Electronics “,	3rd Edition, TataMcGraw-Hill, ISBN: 0–07–049492–4
Andrew S. Tanenbaum	Computer Networks	PHI, Fifth Edition, ISBN : 978-0132-126953
R.K jain	IT Tools	Khanna Publishing House
Ajit Mittal	Mastering PC and Hardware and networking	Khanna Publishing House
Sarika Gupta	Information Security and cyber laws	Khanna Publishing House
Reference Books		
Ashok Arora	Fundamentals of Computer Systems.	
Russell A Stultz	Fundamentals of Computer Systems	
James F. Kurose and Keith W. Ross	"Computer Networking: A Top-Down Approach Featuring the Internet	Pearson Education, 6th Edition, ISBN : 978-02737-68968
Flyod	“Digital Principles”	Pearson EducationISBN:978-81-7758-643-6

Name of the Subject : Web Designing		
Course Code : BVSWC102	**Semester:**	
Weekly Teaching Hours: TH: 03 Tut: 00	**Scheme of Marking TH: 40 IA: 10 Total: 50**	
TH Exam Duration: 03 Hours	**Scheme of Marking PR: --**	
Credit :03		
Content		**Hours**
Unit – I	**Web Design Principles and Introduction to HTML**	5
	Basic principles involved in developing a web site, Planning process, rules of web designing, designing a vigation bar, Page design, Home Page Layout, Design Concept, Brief History of Internet, what is World Wide Web, Why create a website, Web Standards What is HTML, HTML Documents, Basic structure of an HTML document, Creating an HTML document, Markup Tags, Heading-Paragraphs, Line Breaks, Introduction to elements of HTML, Working with Text, Working with Lists, Tables and Frames, Working with Hyperlinks, Images and Multimedia, Working with Forms and controls	
Unit – II	**Movie Editing Tools and Customizing and Embedding Multimedia components in Web Pages**	7
	. • Familiarization of interface components. • Importing pictures. • Importing Audio and Video Files. • Splitting and Joining Movie Clips. • Adding Titles and publishing. • Compatible Multimedia file formats for Web Pages. • Embedding Audio file. • Embedding Video file. • Embedding Flash file.	
Unit – III	**Introduction to Cascading Style Sheets and Java script**	7
	Concept of CSS, Creating Style Sheet, CSS Properties, CSSS tyling (Background, Text Format, Controlling Fonts), Working with block elements and objects, Working with Lists and Tables, CSS Id and Class, CSS Color, CSS templates Javascript Basics, JavaScript Events, Javascript conditions and loop control structures, Alert, Prompt and Confirm statements, Javascript validation. Web Scripting – Java Script. • Java Script review. • Functions – user defined. • String Object. • Math Object. • Array Object. • Events. • Case Studies.	
Unit – IV	**Introduction to Web Publishing or Hosting and Bootstrap**	7
	Dynamic Web templates, SEO - Search Engine Optimization. • Forms – Advanced, Creating the Website, Saving the site, Working on the website, Creating website structure, Themes-Publishing web sites, Authoring tools History, Fundamentals of Bootstrap, Bootstrap Grid System, Bootstrap Form and Form Components, Introduction Jquery, Element Selector, Document ready function, Events, Event handling with Html or Bootstrap components	
Unit – V	**Introduction to Database Management System**	10
	Database Concepts – RDBMS Tool. • Basics of RDBMS. • SQL – Creating and Opening Database. • Creating and populating tables. • Modifying the content and structure of table. • Ordering and Grouping. • Operating with multiple tables. CURD Operation using MONGODB and My SQL, Single Valued Normalization: 1NF, 2NF, 3NF, BCNF	
Unit – VI	**Operating Web Based Applications**	4

	. • Online Reservation Systems. • E-Governance. • Online Shopping and Bill payments. • Online Tutorials and Tests. • Project Management – Web Based Application development. • Project essentials and tips. • Case Study - Online Game. • Case Study - Online Quiz. • Case Study – Online Bill Calculator	

Text Books		
Name of Authors	Title of the Book	Publisher
Kogent Learning Solutions Inc.	HTML 5 in simple steps	Dreamtech Press
Murray,Tom/Lynchburg	Creating a Web Page and Web Site	College,2002
Tanweer Alam	Web Designing and Development	Khanna Publishing House
Murray,Tom/Lynchburg	Creating a Web Page and Web Site	College,2002
Reference Books		
	Web Designing & Architecture-Educational Technology Centre	University of Buffalo
Steven M. Schafer	HTML, XHTML, and CSS Bible, 5ed	Wiley India
John Duckett	Beginning HTML, XHTML, CSS, and JavaSc	Wiley India
Ian Pouncey, Richard York	Beginning CSS: Cascading Style Sheets for Web Design	Wiley India

Subject Name: Programming in C		
Course Code :BVSWC103	**Semester: I**	
Weekly Teaching Hours: TH: 03 Tut: 00	**Scheme of Marking TH: 40 IA: 10 Total: 50**	
TH Exam Duration: 03 Hours	**Scheme of Marking PR: -- 25 Practical 25 Term**	
Credit :3		
Course Objectives :		
1.To learn basic concepts of programming language.		
2.To study different control structure .		
3. To learn C language constructs and pointers in depth		
Course Outcomes :		
1. Student will be able to apply appropriate constructs of C language, coding standards for application development		
2 Students will be able to use different control structure.		
3.Students will be to use dynamic memory allocation concepts in various application developments		
4.Students will be to file handling in various application developments.		
Contents		**Hours**
Unit – I	**1.0 Programming Concepts & Techniques:**	06
	Program Concept, Characteristics of Programme, Stages in Program Development, Tips for Program Designing, Programming Aids, Algorithms, Pseudo code, Notations, Design, Flowcharts, Symbols, Rules, compiler & Interpreter. Introduction to programming techniques, Top-down & Bottom-up approach, Unstructured, & Modular programming, Cohesion, Coupling, Debugging, Syntax & Logical Errors, Linking and Loading, Testing and Debugging, Documentation	
Unit – II	**2.0 Data I/O, Control Structures**	06
	Introduction to problem solving through algorithm and flowchart, Overview, Character set, Keywords and Identifiers, Constants and Variables, Data types, Operators and Expressions, Operator precedence and associativity, Type casting. Definition and properties, Principles of flowcharting, Flowcharting symbols, Converting algorithms to flowcharts Basic structure of C program, Formatted and Unformatted Input and Output, Conditional branching - if, switch statement, Iterative loops – while, do while and for statement, break and continue statement, goto statement.	
Unit –III	**3.0 Arrays, Structure, Union**	06
	Introduction, Declaration and Initialization, Accessing Array elements, Memory, representation of Array, One dimensional Arrays, Two dimensional Arrays(matrix) ,Character Arrays and Strings (Operations on String) Defining Structure, Declaration, Initialization, Array of Structures, Structure and Functions, Nested Structures, Unions , Enumerated data type, typedef	
Unit –	**4.0 Functions**	06
	Introduction, Standard Library Functions, User Defined Functions (UDF) – Declaration, Definition, Function call, Formal parameter list, Return Type, Function call, Block structure, Passing arguments to a Function: call by reference, call by value, Recursive Functions, arrays as function arguments.	
Unit – V	**5.0Pointers**	06
	Introduction to Pointers, dynamic memory allocation, pointer to pointer, pointer to single and multidimensional arrays, array of pointers, string and structure manipulation using pointers, pointer to functions, Pointers and Dynamic Memory Allocation, Link List(SLL)	
Unit –	**6.0 File Handling**	06

	Concept of Files, File opening in various modes and closing of a file, reading from a file, writing onto a file Pointer to file structure and basic operations on file, file handling in C.	

Text Books		
Name of Author	**Title of the Book**	**Publisher**
YashavantKanetkar	Let us C	BPB Publication
E. Balagurusamy	Programming in ANSI C	Tata McGraw Hill
Reference Books		
Byron Gottfried	Programming with C	Tata McGraw Hill
YashavantKanetkar	Exploring C	BPB Publication
Kernighan BW, Dennis M.	The C Programming Language	PrenticeHall
Digital Reference		
1. http://www.cprogramming.com/tutorial/c-tutorial.html		
2. http://nptel.ac.in/courses/106104128/		
3. http://nptel.ac.in/courses/106105085/1		

	File system basics, File operations, File opening modes, String I/O in files, and Record I/O in files, Text and Binary files, Command Line Arguments	

Subject Name: Operating System	
Course Code :BVSWC104	**Semester: I**
Weekly Teaching Hours: TH: 03 Tut: 00	**Scheme of Marking TH: 40 IA: 10 Total: 50**
TH Exam Duration: 03 Hours	**Scheme of Marking PR: --**
Credit:3	

Course Objective :

1. To study and understand different system software like Assembler, Macro-processor and Loaders / Linkers.
2. To introduce basic concepts and functions of modern operating systems
3. To understand the concept of a process and thread
4. To apply the cons of process/thread scheduling.
5. To apply the concept of process synchronization

Course Outcome

1. To learn independently modern software development tools and creates novel solutions for language processing applications
2. Fundamental understanding of the role of Operating Systems
3. To understand the concept of a process and thread
4. To apply the cons of process/thread scheduling
5. To apply the concept of process synchronization, mutual exclusion and the deadlock

Content		Hours
Unit – I	**System Software**	06
	System software, Application software; concepts of files and folders; Basic features of two GUI operating systems: Windows & Linux (Basic desk top management); Programming Languages, Compiler, Interpreter, Databases; Application software: Generic Features of Word processors, Spread sheets and Presentation software	
Unit – II	**Introduction to Operating System**	06
	What is an operating system? History of operating system, Computer hardware & Software, Different operating systems, Various System Software associated with Operating Systems, Shell and Kernel, Systems Calls and Theirs types and implementation	
Unit – III	**Process & Threads**	
	Processes, PCB, Process States, Threads & TCB, difference and Similarities in Threads and Process. Inter-process communication, CPU scheduling, IPC problems.	
Unit – IV	**Process Synchronization & deadlocks**	06
	Critical Section Problems &Semaphores, Classical Problems of process Synchronization, Introduction to deadlocks, Deadlock detection and recovery, Deadlock avoidance, Deadlock prevention, issues	
Unit – V	**Memory Management and File Management**	06
	Address Spaces and Address Translation, Swapping & memory allocation, Paging & Segmentation, Virtual Memory & Demand Paging, Page Replacement Algorithm, Thrashing File Systems: Files, directories, file system & Directories implementation, file-system management and optimization, File Allocation Methods, MS-DOS file system, UNIX V7 file system	
Unit – VI	**Disk Management & Case Study**	06
	Disk Structure ,Disk Scheduling Algorithm (FCFS, RAID, Network Operating System, Real Time Operating System, Distributed Operating System	

Text Books		
Name of Authors	**Title of the Book**	**Publisher**
Silberschatz, Galvin, Gagne	Operating System Principles	Wiley
William Stalling	Operating System-Internal and Design Principles	Pearson Education India
Andrews Tanenbaum	Modern Operating System	Pearson Education India
Reference Books		
DhanjayDhamdhere	Operating System –A Concept-Based Approach	McGraw Hill Education
Dietel, Chofenes	Operating System	Pearson Education India
Achyut Godbole & Atul Kahate	Operating System	McGraw Hill Education

Lab-Web Designing	
Course Code :**BVSWL105**	Semester: **I**
Weekly Practicals: PR: **01** Tut: **00**	Scheme of Marking TH: **--**
TH Exam Duration:--	Scheme of Marking PR: **25,** IA: **25,** Total: **50**
Credit:1.5	

Content

1. Introduction to HTML Tags :- Working of Web browser, Introduction to static Web pages and dynamic web pages, HTML body structure, HTML Tags:- Elements, Attribute, Heading tag, Paragraph tag, Formatting tags (Bold text, Important text, Italic text, Emphasized text, Marked text, Small text, Deleted text, Inserted text, Subscripts, Superscripts), Background color, image, font color, effects, Table tag List.
2. Advance HTML tags :- Frames iframes, anchor tag, Multimedia
3. Create Static Website by using all HTML Tags.
4. Introduction to Internal CSS
5. Introduction to External CSS
6. HTML Form tags(Elements, Attributes, properties, etc)
7. Introduction to JAVA Script(Programming basics)
8. Advance JAVA Script programming basics(Alert, Confirm, prompt) and Validations.
9. Create 3 Web page using Bootstrap framework use bootstrap table, image and form elements etc.
10. Create the web page using Jquery effects, events on different elements.
11. Design any database with at least 3 entities and relationships between them. Apply DCL and DDL commands. Draw suitable ER/EER diagram for the system

    Design and implement a database and apply at least 10 different DML queries for the following task. For a given input string display only those records which match the given pattern or a phrase in the search string. Make use of wild characters and LIKE operator for the same. Make use of Boolean and arithmetic operators wherever necessary.
12. Execute the aggregate functions like count, sum, avg etc. on the suitable database. Make use of built in functions according to the need of the database chosen. Retrieve the data from the database based on time and date functions like now (), date (), day (), time () etc. Use group by and having clauses

Lab-Programming in C	
Course Code :**BVSWL105**	Semester: **I**
Weekly Practicals: PR: **01** Tut: **00**	Scheme of Marking TH: **--**
TH Exam Duration:--	Scheme of Marking PR: **25,** IA: **25,** Total: **50**
Credit:1.5	
Content	

Suggested List of Experiments:

1. Represent sets using one dimensional arrays and implement functions to perform i. Union ii. Intersection iii. Difference iv. Symmetric difference of two sets
2. Represent matrix using two dimensional arrays and perform following operations with and without pointers: i. Addition ii. Multiplication iii. Transpose iv. Saddle point
3. Implement following operations on string with / without pointers (without using library functions)

   i. Length ii. Palindrome iii. String comparison iv. Copy v. Reverse vi. Substring
4. Create a Database using array of structures and perform following operations on it:

   i. Create Database ii. Display Database iii. Add record

   iv. Search record v. Modify record vi. Delete record
5. a) Sort the set of strings in ascending order using Bubble sort and descending order by using Selection sort or Insertion sort.(Display pass by pass output) b) Search a particular string using binary search with and without recursion
6. Implement a singly linked list with following options i. Insertion of a node at any location ii. Deletion of a node from any location iii. display a list iv. Display in reverse v. Revert the list without using additional data structure
7. Implement sequential file and perform following operations: i. Display ii. Add records iii. Search record iv. Modify record v. Delete record

Semester I - On-Job-Training (OJT)/Qualification Packs (Any One)

Group GSD1 of Qualifier Packs

SubjectName: Technical Writer	
Course Code : **BVSWE117**	Semester: **I**
Weekly Skilling Hours: PR: **24** Tut: **00**	Scheme of Marking TH: **00,** IA: **00,** Total: **00**
PR Exam Duration: **06 Hours**	Scheme of Marking PR: **200,** IA: **00,** Total: **200**
Credit:**15**	**Choose any one from specified Group GSD1 of Qualification Packs**
Syllabus for this qualifier Pack is available on **http://www.sscnasscom.com/qualification-pack/SSC/Q0505/**	

Subject Name: Infrastructure Engineer (SSC/Q0801)	
Course Code : **BVSWE128**	Semester: **I**
Weekly Skilling Hours: PR: **24** Tut: **00**	Scheme of Marking TH: **00,** IA: **00,** Total: **00**
PR Exam Duration: **06 Hours**	Scheme of Marking PR: **200,** IA: **00,** Total: **200**
Credit:**15**	**Choose any one from specified Group GSD1 of Qualification Packs**
Syllabus for this qualifier Pack is available on **http://www.sscnasscom.com/qualification-pack/SSC/Q0801/**	

Subject Name: Associate – CRM (SSC/Q2202)	
Course Code : **BVSWE139**	Semester: **I**
Weekly Skilling Hours: PR: **24** Tut: **00**	Scheme of Marking TH: **00,** IA: **00,** Total: **00**
PR Exam Duration: **06 Hours**	Scheme of Marking PR: **200,** IA: **00,** Total: **200**
Credit:**15**	**Choose any one from specified Group GSD1 of Qualification Packs**
Syllabus for this qualifier Pack is available on **http://www.sscnasscom.com/qualification-pack/SSC/Q0202/**	

***Skill Practical assessment will be done rules/ procedure of respective Skill Sector Council of India.**

Semester

II

Syllabus

Subject Name :Data Structure		
Course Code :BVSWC201	**Semester: II**	
Weekly Teaching Hours: TH: 03 Tut: 00	**Scheme of Marking TH: 40 IA: 10 Total: 50**	
TH Exam Duration: 03 Hours	**Scheme of Marking PR: --**	
Credit:3		

	Content	Hours
Unit – I	**Introduction**	06
	Introduction: Data Structures types, Importance of Data Structure, Abstract data Type. Algorithms: Complexity, Time space Trade-offs, Arrays: Operation Performed on array Dynamic Memory Allocation	
Unit – II	**Searching Techniques**	06
	Searching Techniques: List Searches using Linear Search, Binary Search, Sorting Techniques: Basic concepts, Sorting by: Bubble, Insertion and selection. Hash Function: Address calculation techniques, Common hashing Functions, Collision resolution, Linear probing, quadratic probing	
Unit –III	**Unit 3**	06
	Stack: LIFO structure, PUSH and POP operations, Polish Notation, Queue: FIFO structure, Circular Queue, Operations on Queues.	
Unit – IV	**Unit IV**	06
	Introduction, single linked list, Operations on a Single linked list, Advantages and disadvantages of single linked list, circular linked list, Double linked list	
Unit – V	**Unit V**	06
	Tree: General tree terminology, Tree traversal, Operation on Binary Tree Heap : Heap Sort	
Unit – VI	**Unit 6**	06
	Graphs: Graph Storage structure (Adjacency Matrix, Adjacency List)Operations on graphs Traverse Graph (Depth-First, Breadth-First), Minimum Spanning Tree, Kruskal's algorithm, Prim's algorithm,	

Text Books		
Name of Authors	**Title of the Book**	**Publisher**
Ellis Horowit Sartaj Sahani, Susan Anderson Freed	Fundamentals of Data Stmctures in C 12 nd Edition]	Universities Press.
Lipschut	Data structure	MGH
Reference Books		
A. Tanenbaum	Data and file structure	PHI

Subject Name :Concepts of Data Mining	
Course Code :BVSWC202	**Semester: II**
Weekly Teaching Hours: TH: 03 Tut: 00	**Scheme of Marking TH: 40 IA: 10 Total: 50**
TH Exam Duration: 03 Hours	**Scheme of Marking PR: --**
Credit : 3	

Content		Hours
Unit – I	**1.0 Introduction** Data warehousing	06
	Introduction to Data warehousing, needs for developing data Warehouse, Datawarehouse systems and its Components, Design of Data Warehouse, Dimension and Measures, Data Marts:-Dependent Data Marts, Independents Data Marts & Distributed Data Marts, Conceptual Modeling of Data Warehouses: -Star Schema, Snow flake Schema, Fact Constellations, Multidimensional Data Model & Aggregates	
Unit – II	**2.0 Preprocessing**	06
	OLAP, Characteristics of OLAP System, Motivation for using OLAP, Multidimensional View and Data Cube, Data Cube Implementations, Data Cube Operations, Guidelines for OLAP Implementation, Difference between OLAP & OLTP, OLAP Servers: -ROLAP, MOLAP, HOLAP	
Unit – III	**3.0 Introduction** to Data Mining	06
	Introduction to Data Mining, Knowledge Discovery, Data Mining Functionalities, Data Mining System categorization and its Issues. Data Processing:-Data Cleaning, Data Integration and Transformation. Data Reduction, Data Mining Statistics. Guidelines for Successful Data Mining	
Unit – IV	**4.0 Data Mining Association**	06
	Association Rule Mining:-Introduction, Basic, The Task and a Naïve Algorithm, Apriori Algorithms, Improving the efficiency of the Apriori Algorithm, Apriori - Tid, Direct Hasing and Pruning (DHP), Dynamic Item set Counting (DIC), Mining Frequent Patterns without Candidate Generation (FP-Growth), Performance Evaluation of Algorithms	
Unit – V	**5.0 Classification**	06
	Classification:-Introduction, Decision Tree, The Tree Induction Algorithm, Split Algorithms Basedon Information Theory, Split Algorithm Based on the Gini Index, Over fitting and Pruning, Decision Trees Rules, Naïve Bayes Method.	
Unit – VI	**6.0Data Mining Tools**	06
	Cluster Analysis: -Introduction, Desired Features of Cluster Analysis, Types of Cluster Analysis Methods: -Partitioned Methods, Hierarchical Methods, Density-Based Methods, Dealing with Large Databases. Quality and Validity of Cluster Analysis Methods. WEKA (Waikato Environment for Knowledge Analysis): is a well-known suite of machine learning software that supports several typical data mining tasks, particularly data preprocessing, clustering, classification, regression, visualization, and feature selection. RapidMiner: Formerly called YALE (Yet another Learning Environment), is an environment for machine learning and data mining experiments that is utilized for both research and real-world data mining tasks.	

Text Books		
Name of Authors	**Title of the Book**	**Publisher**

Jiawei Han, Micheline Kamber	Data Mining: Concepts and Techniques	Morgan Kaufmann Publishers
Reference Books		
Tan, Steinbach, Kumar	Introduction to Data Mining	Pearson Addison Wesley, 2006
David Hand, Heikki Mannila & Padhraic Smyth	Principles of Data Mining	PHP Publication

Subject Name :OOPs with Java		
Course Code :BVSWC203	**Semester: II**	
Weekly Teaching Hours: TH: 03 Tut: 00	**Scheme of Marking TH: 40 IA: 10 Total: 50**	
TH Exam Duration: 03 Hours	**Scheme of Marking PR: --**	
Credit : 3		

	Content	**Hours**
Unit – I	**1.0 Basics of Java**	06
	History of java, Advantages of java, JVM, Java Environment Setup, Programming Structure and naming conventions, Variables and Data types, Operators, Decision and Control Statements, Arrays and Strings AVA program structure, Tokens, Statements, Data Types, Declaration of Variables, Scope of Variables, Symbolic Constants, Type Casting	
Unit – II	**2.0 Object Oriented Programming with Java**	08
	Object Oriented Programming, Features of OOPS, Class and Object, Access modifiers, Methods, , Static variables and static methods, Overloading methods, Passing and returning object as argument, Constructors and Overloading constructors,	
Unit –	**3.0 Inheritance**	04
	Use of inheritance, IS-A,HAS-A,USES-A relationship, Method overriding, Super keyword and Final keyword,(Final Variables and Methods), Abstract classes and methods, Packages, interfaces, Visibility Control Arrays: One Dimensional & two Dimensional, strings, Vectors, wrapper Classes, Defining Interface Extending Interface, Implementing Interface, Accessing Interface Variable, System Packages, Using System Package, Adding a Class to a Packages, Hiding Classes.	
Unit –	**4.0 Exception handling and Multithreading**	06
	Creating Threads, Extending the Threads Class, Stopping and Blocking a Thread, Life Cycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization, Implementing the Runnable Interface Exceptions and their types ,Handling exceptions, Use of Multithread programming, Thread class and Runnable interface, Thread priority, Thread synchronization	
Unit – V	**5.0 File handling and JDBC**	06
	Stream classes, Class hierarchy, Creation of text file, Reading and writing text files, JDBC Architecture, JDBC Drivers, Java Database Connectivity using JDBC	
Unit –	**6.0 GUI Applications**	06
	Applets and its life cycle, Graphics Class, AWT, Layout managers, Event handling classes and interfaces, SWING and Its Components	

Reference Books

Name of Authors	Title of the Book	Publisher
Herbert Schildt	Java™: The Complete Reference, Seventh Edition	TMH
Cay S Horstmann, Fary Cornell	Core Java Vol I	Sun Microsystems Press
Ken,D.Holmers, J. Gosling, P. Goteti	The Java Programming Language 3rd Edition	Sun Microsystems Press
Deitel&Deitel	How To Program JAVA	Pearson Education

Text Books

E Balguruswamy	Programming with Java- A Primer	TMH
Steven Holzner	JAVA 2 Programming Black Book,	Wiley India

Reference Website:http://www.tutorialspoint.com, http://www.javatpoint.com, http://www.roseindia.net, http://www.studytonight.com/

Subject Name : Multimedia Tools and Applications	
Course Code :BVSWC204	**Semester: II**
Weekly Teaching Hours: TH: 03 Tut: 00	**Scheme of Marking TH: 40 IA: 10 Total: 50**
TH Exam Duration: 03 Hours	**Scheme of Marking PR: --**
Credit : 3	

Content		Hours
Unit – I	1.0 **Multimedia System**	06
	Introduction To Multimedia, Needs and Areas of use, Identifying Multimedia Elements - Text, Images, Sound, Animation and Video, Making Simple Multimedia With PowerPoint. TEXT - Concepts of Plain & Formatted Text, RTF & HTML Texts, Using Common Text Preparation Tools, Conversion to and from of Various Text Formats, Creating text using standard software.	
Unit – II	**2.0 Sound**	06
	SOUND - Sound and its Attributes, Sound and Its Effects in Multimedia, Frequency, Sound Depth, Channels and its Effects on Quality and Storage, Size Estimation of Space of a Sound File, Sound Card Standard – FM Synthesis Cards, Waves Table Cards, MIDI and MP3 Files and Devices, 3D Sounds, Recording and editing sound using sound editors like Audacity, Sound forge etc.	
Unit – III	**3.0 Images**	06
	IMAGES - Importance of Images Graphics in Multimedia, Vector and Raster Graphics, Regular Graphics vs. Interlaced Graphics, Image Capturing Methods - Scanner, Digital Camera Etc. Color models-RGB, CYMK, Hue, Saturation, and Brightness, Various Attributes of Images Size, Color, Depth Etc, Various Image File Format BMP, DIB, CIF, PIC, and TIF Format Their Features And Limitations, Image format conversion, various effects on images. Create images using Photoshop, CorelDraw and apply various effects, Using Layers, Channels and Masks in images.	
Unit – IV	**4.0 Video**	06
	VIDEO- Basic of Video, Analog and Digital Video Type of Video, Digitization of Analog Video, Video Standard – NTSC, Pal, HDTV, Video Capturing Media /Instruments Videodisk Camcorder Compression Techniques, File Formats AVI, MJPG, MPEG, Video Editing and Movie Making Tools, converting formats of videos, recording and editing videos using video editing software like adobe premiere or Sony Vegas.	
Unit – V	**5.0 Animation**	09
	ANIMATION- Concepts of animation, 2D and 3D animation, tools for creating animation, character and text animation, creating simple animation using GIF animator and flash, Morphing and Applications.	
Unit – VI	**6.0 Authoring tools for Multimedia**	3
	Introduction to various types of multimedia authoring tools, CD/DVD based and web based tools, features and limitations, creating multimedia package using all components.	

Name of Authors	Title of the Book	Publisher
P. K. ANDLEIGH, KIRAN THAKRAR	MULTIMEDIA SYSTEM DESIGN	
RALF STEINMETZ, & KLARA NASHTEDT	MULTIMEDIA COMPUTING COMMUNICATION & APPLICATION	
V.K. Jain,	Multimedia & Its Applications	Khanna Publishing House
Ramesh Bangia	. Fundamentals of Multimedia	Khanna Publishing House
Reference Books		
K sayood	Introduction to data compression	

LAB -Data Structure Using C	
Course Code :**BVSWL205**	Semester: **II**
Weekly Practical: PR: **01** Tut: **00**	Scheme of Marking TH: **--**
TH Exam Duration:--	Scheme of Marking PR: **25,** IA: **25,** Total: **50**
Credit:1.5	

Contents

Suggested List of Experiments:

1. **1.** Write a program to demonstrate insertion, deletion, search and displaying of an element in an array,
2. **2.** Write a program to demonstrate sorting algorithm. (using any one of these techniques: bubble, Insertion, selection)
3. **3.** Write a program to demonstrate operations performed on stack.
4. **4.** Program to convert infix expression to postfix and infix to postfix.
5. **5.** Write a program to demonstrate operations on queue.
6. **6.** Write a program to demonstrate operations on singly link list.
7. **7.** Write a program to implement Stack as Linked List.
8. **8.** Write a program to implement operations on double link list.
9. **9.** Write a program to demonstrate creation, traversing and searching in Binary Search Tree.
10. **10.** Write a program to traverse a graph using DFS with an adjacency matrix.
11. **11.** Write a program to traverse a graph using BFS with an adjacency matrix.

References:

1. Unix Concepts and Applications by Sumitabha Das
2. http://www.ossec.net/
3. www.linuxmanpages.com/man1/**pflogsumm**.1.php
4. www.**webalizer**.org/
5. http://www.computersecuritystudent.com/SECURITY_TOOLS/DVWA/
6. https://www.wireshark.org/#learnWS
7. https://wiki.openssl.org

Lab - Java	
Course Code :**BVSWL206**	Semester: **II**
Weekly Practicals: PR: **01** Tut: **00**	Scheme of Marking TH: **--**
TH Exam Duration:--	Scheme of Marking PR: **25,** IA: **25,** Total: **50**
Credit:1.5	

Contents

- Design a simple java class with appropriate programming structure and naming conventions
- Sample programs on conditional statements and loop controls
- Demonstrate class, object and methods with various access modifiers
- Sample program on static variables and static methods
- Sample program on passing and returning object as argument
- Demonstrate constructors overloading
- Demonstrate types of inheritance
- Abstract classes and methods
- Program on Packages and Interfaces
- Demonstration of threads using Thread class and Runnable Interface
- Sample programs on file handling operations
- CRUD operations using JDBC

Reference Books

Name of Authors	Title of the Book	Publisher
Herbert Schildt	Java™: The Complete Reference, Seventh Edition	TMH
Cay S Horstmann, Fary Cornell	Core Java Vol I	Sun Microsystems Press
Ken,D.Holmers, J. Gosling, P. Goteti	The Java Programming Language 3rd Edition	Sun Microsystems Press
Deitel&Deitel	How To Program JAVA	Pearson Education
Text Books		
E Balguruswamy	Programming with Java- A Primer	TMH
YashavantKanetkar	"Let Us Java	BPB
Steven Holzner	JAVA 2 Programming Black Book,	Wiley India

Semester II - On-Job-Training (OJT)/Qualification Packs (Any One)

Group GSD2 of Qualification Packs

Subject Name: Web Developer (SSC/Q0503)	
Course Code : **BVSWE217**	Semester: **II**
Weekly Skilling Hours: PR: **24** Tut: **00**	Scheme of Marking TH: **00,** IA: **00,** Total: **00**
PR Exam Duration: **06 Hours**	Scheme of Marking PR: **200,** IA: **00,** Total: **200**
Credit:**15**	**Choose any one from specified Group GSD2 of Qualification Packs**
Syllabus for this qualifier Pack is available on **http://www.sscnasscom.com/qualification-pack/SSC/Q0503/**	

Subject Name: Test Engineer (SSC/Q1301)	
Course Code : **BVSWE228**	Semester: **II**
Weekly Skilling Hours: PR: **24** Tut: **00**	Scheme of Marking TH: **00,** IA: **00,** Total: **00**
PR Exam Duration: **06 Hours**	Scheme of Marking PR: **200,** IA: **00,** Total: **200**
Credit:**15**	**Choose any one from specified Group GSD2 of Qualification Packs**
Syllabus for this qualifier Pack is available on **http://www.sscnasscom.com/qualification-pack/SSC/Q1301/**	