॥ सा विद्या या विमुक्तये ॥

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

'ज्ञानतीर्थ', विष्णुपुरी, नांदेड – ४३१ ६०६ (महाराष्ट्र राज्य) भारत

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

'Dnyanteerth', Vishnupuri, Nanded - 431 606 (Maharashtra State) INDIA

Established on 17th September, 1994, Recognized By the UGC U/s 2(f) and 12(B), NAAC Re-accredited with'B++' grade

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

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विद्यापीठ अनुदान आयोगाने शैक्षणिक वर्ष २०२०–२१ पासून मान्यता दिलेल्या B. Voc. Programming Skills for Software Development या पदवी अभ्यासक्रमाचा प्रथम, द्वितीय व तृतीय वर्षाचे अभ्यासक्रम (Syllabus) लागू करणे बाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, विज्ञान व तंत्रज्ञान विद्याशाखेतील विद्यापीठ अनुदान आयोगाने शैक्षणिक वर्ष २०२०–२१ पासून मान्यता दिलेल्या B. Voc. Programming Skills for Software Development या पदवी अभ्यासक्रमाचे प्रथम, द्वितीय व तृतीय वर्षाचे Syllabus अनुक्रमे शैक्षणिक वर्ष २०२२–२३, २०२३–२४, २०२४–२५, पासून लागू करण्यास मा. कुलगुरू महोदयांनी मा. विद्यापरिषदेच्या मान्यतेच्या अधीन राहून मान्यता दिलेली आहे.

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या **www.srtmun.ac.in** या संकेतस्थळावर उपलब्ध आहेत. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी. ही विनंती.

जा.क्र.:शैक्षणिक–१/परिपत्रक/व्होकेशनल अभ्यासक्रम/N-२०२२–२३/६३२

दिनांक : १८.१०.२०२२

सहा.कुलसचिव
शैक्षणिक (१–अभ्यासमंडळ) विभाग

प्रत माहिती व पुढील कार्यवाहीस्तव :

१) मा. अधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.
२) मा. संचालक, परीक्षा व मूल्यमापन मंडळ यांचे कार्यालय, प्रस्तुत विद्यापीठ.
३) प्राचार्य, सर्व संबंधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
४) साहाय्यक कुलसचिव, पदव्युत्तर विभाग, प्रस्तुत विद्यापीठ.
५) अधीक्षक, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.
६) सिस्टम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ. याना देवून कळविण्यात येते की, सदरील परिपत्रक विद्यापीठाच्या संकेतस्थळावर प्रसिध्द करण्यात यावे.

College of Computer Science and Information Technology, Latur
Department of Computer Science
Program Structure for
B. Voc. in Programming Skills for Software Development
B. Voc. F. Y. (Semester I +Semester II)

Class		Course Code	Course Title	Lect.per week	No. of Credits	Marks ESC	Marks CE	Total Marks
SEMESTER – I NSQF Level-4 Qualification Title: Junior Software Developer								
.Voc. F. Y. B	General Education	BVOC.1.01	Practical English Part I	4	4	75	25	100
		BVOC.1.02	Numerical Aptitude &Logical reasoning	4	4	75	25	100
		BVOC.1.03	Fundamental of Information Technology	4	4	75	25	100
	Component Skill	BVOC.1.04	Programming Language Concepts	4	4	75	25	100
		BVOC.1.05	Software Engineering and Testing	4	4	75	25	100
		BVOC.1.06	Office Automation	4	4	75	25	100
		BVOC.1.07	Lab 1: Programming Language Concepts	2	2	30	20	50
		BVOC.1.08	Lab 2: Office Automation	2	2	30	20	50
		BVOC.1.09	Lab 3: Software Engineering and Testing	2	2	30	20	50
				30				**750**
SEMESTER – II NSQF Level-5 Qualification Title: Web Developer								
F. Y. B. Voc.	General Education	BVOC.2.01	Practical English Part II	4	4	75	25	100
		BVOC.2.02	Data Analysis and Discrete Mathematics	4	4	75	25	100
		BVOC.2.03	Operating System	4	4	75	25	100
	Skill Component	BVOC.2.04	Web Technology	4	4	75	25	100
		BVOC.2.05	Graphics Design and Content Management Tools	4	4	75	25	100
		BVOC.2.06	Desktop Publishing	4	4	75	25	100
		BVOC.2.07	Lab 1: Web Technology	2	2	30	20	50
		BVOC.2.08	Lab 2: Graphics Design and Content Management Tools	2	2	30	20	50
		BVOC.2.09	Lab 3: Desktop Publishing	2	2	30	20	50

	30				**750**

B. Voc. in Programming Skills for Software Development

B. Voc. F. Y. (Semester I)

B VOC.1.01 Practical English Part I

Course Objectives:

1. To make a comprehensive use of English in day-to-day life.
2. To help Students develop the ability to learn and contribute critically.
3. To develop the writing skills of the students.
4. To help the students to understand the basic usages of English.

Course Outcome:

By the end of this course students should be able to:

1. Understand and demonstrate Basic English usages for their different purposes.
2. Clear entrance examination and aptitude tests.
3. Write various letters, reports required for professional life.

Unit-1: Basic English Grammar	NOS	Hours
Noun, Verb, Adjective, Adverb	SSC/N9001	10
Unit-2: Sentence Elements	NOS	Hours
Elements of sentences and their structures, Clauses: - Noun, Adjective, Adverb, Sentence: - Simple, Compound, Complex	SSC/N9001	
Unit-3: Morphology	NOS	10
Affixes, Processes of Word Formation: Major and Minor Processes, Morphological Analysis of words	SSC/N9001	
Unit-4: Writing Skills	NOS	Hours
Essay Writing, Email Writing, Resume	SSC/N9001	10
Unit-5: Oral Communication	NOS	Hours
Group Discussion, Interview	SSC/N9001	10
Unit-6: Situational English	NOS	Hours
Greetings, Introducing oneself, Requesting	SSC/N9001	10

Reference Books

1. Modern English Grammar-L. S. Deshpande (creative Publication)
2. A Practical English Grammar- A. J. Thomson. (Oxford University)
3. Macmillan Foundation English. - R. K. Dwivedi& a. Kumar (Mammalian India Ltd)
4. Writing English for You- G. Radhakrishna Pillai (Emerland Publication)
5. High School English Grammar & Composition - Wren & Martin (S. Chand)
6. Radiance Communication Skills- Editorial Board (SRTM University) Orient Black Swan.

7. English Grammer and Composition – Rejendra Pal and PremLataSuri (Sultan Chand and Sons)

B. Voc. in Programming Skills for Software Development

B. Voc. F. Y. (Semester I)

BVOC.1.02 Numerical Aptitude & Logical reasoning

Learning Objectives:

i. Practicing Basics of mathematics
ii. Use of Numbers
iii. This course enables students to develop their ability to reason by introducing them to elements of reasoning
iv. Basics knowledge of different types of Series and Directions.

Course Outcomes:

i. Develops problem solving skills of student
ii. Improves Basic and advanced calculations used in day to day life.
iii. Improves Mental Alertness
iv. Construct a logically sound and well-reasoned argument.

Unit I : Introduction of Number system	NOS	Hours
Numbers: Types of numbers, Divisibility tests of numbers, Formulas for sum of natural numbers, arithmetic progression, Examples for practice.	SSC/N9001	8
Unit II HCF and LCM	NOS	Hours
HCF and LCM : Methods of calculating highest common factor and greatest common divisor, factorization method, Division method, Finding HCF and LCM more than two numbers, LCM factorization method, Division method, Finding HCF and LCM more than two numbers, LCM and HCF of fractions and decimal numbers, Applications of LCM and HCF.	SSC/N9001	8
Unit III: Average	NOS	Hours
Average: Definition of average, Formulae and theoretical problem on average.	SSC/N9001	6
Unit IV: Series of Numbers and Alphabets	NOS	Hours
Series: Types of series, Number Series, Alphabet series, Alpha numeric series.	SSC/N9001	8
Unit V: Analogy	NOS	Hours

Analogy: Completing the Analogous Pair, Direct/Simple Analogy, Choosing the Analogous Pair, Double Analogy, Number analogy, Alphabet analogy, Correlation between letters/numbers.	SSC/N9001	8
Unit VI: Direction Sense Test	NOS	Hours
A. Introduction	SSC/N9001	10
B. Problems based on angular changes in direction		
C. General Problems based on Pythagoras Theorem		
D. Problems on shadows		

References

1. Quantitative Aptitude, Dr.R.S Aggarwal, S.Chand and Company
2. A Modern Approach to Verbal & Nonverbal Reasoning, Dr.R.S Aggarwal, S.Chand and Company
3. www.indiabix.com
4. www.allindiaexams.in

B. Voc. in Programming Skills for Software Development

B. Voc. F. Y. (Semester I)

BVOC.1.03 Fundamental of Information Technology

Learning Objectives:

i. To create overall generic awareness about scope of the field of IT and to impart basic personal computing skills.
ii. To create background knowledge for the various courses in the programme.
iii. It will help them to pursue specialized programs leading to technical and professional careers and certifications in the IT industry.

Course Outcomes:

At the end of this course, student should be able to

i. Understand basic concepts and terminology of information technology.
ii. Have a basic understanding of computers and their operations.
iii. Identify issues related to basic parts.
iv. Understand number systems used in computers
v. To impart functional knowledge about networks and internet. To give an overview of computer application in various fields and an overall generic awareness about the scope of the field of IT

Unit I: Introduction to Information Technology	NOS	Hours
Introduction, Characteristics of computer, Evolution of Computer, Block Diagram of a computer, Digital signals, Binary System, ASCII; Historic Evolution of Computers; Classification of computers: Microcomputer, Minicomputer, mainframes, Supercomputers; Personal computers: Desktop, Laptops, Palmtop, Tablet PC, Workstations, Client and Server Architecture, Hardware & Software; Von Neumann model, Applications of Computer, Capabilities and limitations of computer.	SSC/N9001	10
Unit II Basic Computer Organization	NOS	Hours

Input Devices :- Keyboard, Mouse, trackball, Joystick, electronic pen, Touch Screen, Image Scanner, OCR, OMR, MICR, Bar code reader, Digitizer, speech recognition devices. Output Devices :- Monitors, Dot-matrix printer, Ink-jet printer, Laser Printer, Plotter Modem and Projector Bio-metric devices Main Memory: - RAM, ROM, PROM, EPROM, UVEPROM, EEPROM, Base Memory, Cache Memory, Sequential Access Memory: - Magnetic Tape, Direct Access Memory: - HDD. Optical Storage: - CD, DVD, Blue-ray disk. Flash Memory: - Pen-drive, memory card.	SSC/N9001	
Unit III: Operating System and Introduction to Windows 10	NOS	10
Introduction to Operating System, Functions of Operating System, Types of Operating System, DOS and Windows OS, Linux OS, Smart phone OS and Android Operating System Architecture of DOS, Windows, Linux and Android Operating System.	SSC/N9001	
Unit IV: Number System and Computer Arithmetic	NOS	Hours
Number system types: Decimal, Binary, Octal, Hexadecimal, Conversions from one number system to other number system, Binary Arithmetic: Addition, Subtraction, Multiplication, Division, Complementation Method: One's Complement, Two's complement	SSC/N9001	10
Unit V: Introduction to signals and Logic Gates	NOS	Hours
Introduction to signals: Analog signal, Digital signal Basic Logic Gates: AND, OR, NOT Universal gates: NAND and NOR Special purpose gates: EX-OR and EX-NOR	SSC/N9001	10
Unit VI: Introduction to Computer Network & Internet	NOS	Hours
Definition of Network, Web Browser, Types of Web Browser Introduction to Google chrome, Searching and Browsing Websites, URL, Search engines, Search tips; Server, Workstation, switch, router, network operating systems; Internet: brief history, World Wide Web, Types of Network: - LAN, MAN, WAN, Data Transmission Modes, Internet connections: ISP, Dial-up, cable modem, WLL, DSL, leased line; E-Mail, Email software features (send	SSC/N9001	10

receive, filter, attach, forward, copy, blind copy); File Transfer Protocol, Characteristics of web-based systems, Web pages, introduction to HTML.		

References:

1. Fundamentals of Computer by P.K. Sinha BPB publication 6th Edition ISBN: 81-7656- 752-3
2. Fundamentals of Microprocessor and Microcontrollers by B. Ram
3. Modern Digital Electronics -by R. P. Jain Tata McGraw -Hill Publication 3rd Edition ISBN: 978-0-07-049492-3
4. MICROPROCESSOR -by B. Ram publication 5th Edition.
5. Inside the PC by Peter Norton

B. Voc. in Programming Skills for Software Development

B. Voc. F. Y. (Semester I)

BVOC.1.04 Programming Language Concepts

Learning Objectives:

i. Programming Language Concepts course would enable the students in understanding Basics of Programming Languages and design & write the simple software applications using C programming.
ii. Learn how to design algorithms and flowcharts.
iii. Learn fundamental concepts of C Programming such as. Variables and constants, Operators, conditional and looping statements, Arrays, functions, structure and union, pointer, file handling etc.

Course Outcomes:

After successful completion of this course, students should be able to:

i. To design algorithms and flowcharts to solve any problems.
ii. To write software program to solve the given problem
iii. To use file handling for storing and processing data.
iv. To design program using graphics function in C

Unit I: Introduction to Programming languages	NOS	Hours
Introduction to Computer and Its Types, Introduction to software's: System software, Application software, Database software, Why to Learns about programming Languages, Types of programming Languages, Compilers and Its Types, Interpreter, Algorithm, Flowcharts and Symbol for creating flowchart, Converting algorithm to flowchart, Overview of C Programming, Advantages and Application of C Language Character set, Keywords and Identifiers, Constants and Variables, Data types, Operators and Expressions, Operator	SSC/NOS-501	10

precedence and associativity, Type casting		
Unit II Data I/O, Control Structures	NOS	Hours
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.	SSC/NOS-501	
Unit III: Arrays and Functions	NOS	10
Introduction, Declaration and Initialization, Accessing Array elements, Memory, representation of Array, One dimensional Arrays, Two dimensional Arrays ,Character Arrays and Strings. Introduction to Functions, Standard Library Functions, User Defined Functions (UDF) – Declaration, Definition, Function call, Parameter Passing - by value and by reference, Recursion, Storage Classes, Macros.	SSC/NOS-501	
Unit IV Structure, Union and Pointers	NOS	Hours
Defining Structure, Declaration, Initialization, Array of Structures, Structure and Functions, Nested Structures, Unions, Enumerated data type, typedef, Pointers and Dynamic Memory Allocation	SSC/NOS-501	10
Unit V: File Handling	NOS	Hours
Creation of a new file, file opening mode, Opening an existing file, Reading from file (fscanf, fgets, fgetc), Writing to a file (fprintf or fputs, Moving to a specific location in a file (ftell, fseek, rewind), Reading and Writing Binary files, Closing a file (fclose)	SSC/NOS-501	10
Unit V: Introduction to Graphics Programming in C	NOS	Hours
Introduction, initializing the graphics, C Graphical functions: initgraph, setbkcolor, setcolor, textcolor, settextstyle, gotoxy, line, circle, rectangle, ellipse, floodfill, , getimage, putimage, , Closegraph, cleardevice, sleep, sound, delay etc. simple programs	SSC/NOS-501	10

References:

1. Let us C-YashwantKanetkar.
2. Programming in C- Balguruswamy
3. The C programming Lang., Pearson Ecl – Dennis Ritchie
4. Structured programming approach using C- Forouzah&Ceilberg Thomson learning publication.
5. Pointers in C – YashwantKanetkar

B. Voc. in Programming Skills for Software Development

B. Voc. F. Y. (Semester I)

BVOC.1.05 Software Engineering and Testing

Learning Objectives:

i. To develop software engineering skills and testingplans.
ii. To understand system concepts and its application in Softwaredevelopment.
iii. To enhance skills of designing and testingsoftware.
iv. To learn technical skills to assure production of qualitysoftware.

Course Outcomes:

i. Ability to learn various methods of software development.
ii. Ability to apply various software testing techniques

Unit I: Introduction to Software Engineering	**NOS**	**Hours**
The Evolving Role of Software, Software, Software Characteristics, Software Applications, Software Evolution, Software Crisis & Horizon, Software Myths		10
Unit II: Process Of Software	**NOS**	**Hours**
Software Engineering, Software Process, The Waterfall Model, Incremental Process Models, Evolutionary Process Models, Spiral Model		08
UNIT-III: A Generic View of Process	**NOS**	**Hours**

Software Engineering – A Layered Technology, Process Framework, Personal and Team Process Models, Personal Software Process (PSP), Team Software Process (TSP), Process Technology, Product and process		10
UNIT-IV: AGILE DEVELOPMENT	**NOS**	**Hours**
What Is Agility?, What Is an Agile Process?, The Politics of Agile Development, Agile Process Models, Feature Driven Development (FDD), Software Engineering Practice, The Essence of Practice, Core Principles, Communication, Planning, Modeling Practices		14
UNIT-V: SOFTWARE TESTING STRATEGIES	**NOS**	**Hours**
A Strategic Approach to Software Testing, Unit Testing, Integration Testing, Validation Testing, System Testing, The Art Of Debugging		8
UNIT-VI: TESTING APPLICATION	**NOS**	**Hours**
Software Testing Fundamentals, Internal and External Views of Testing, White-Box Testing, Basic Path Testing, Control Structural Testing, Black Box Testing		10

References:

1. Software Engineering (7 th edition) R.Pressmen M C Graw Hill ISBN-13: 978-0078022128
2. Software Engineering (8 th edition) R.Pressmen M C Graw Hill ISBN-10: 9780089022382
3. Software Testing Concepts and Tools Nageswara Rao Dreamtech Publication ISBN 8177227122, 9788177227123
4. Software Engineering by Roger S. Pressman, Sixth Edition, McGraw Hill International Pub, ISBN- 0077227808.
5. Software Testing in the Real World by Edward Kit, Addition – Wesley Pub, ISBN-0201877562

6. Software Testing by Ron Patton, Second Edition, BPB Publication, ISBN-9780672327988
7. The Art of Software Testing by G. J. Myers, Third Edition, Wiley-InterScience Pub, ISBN: 9781118031964

B. Voc. in Programming Skills for Software Development

B. Voc. F. Y. (Semester I)

BVOC.1.06 Office Automation

Learning Objectives:

i. Office Automation course would enable the students in crafting professional word documents, excel spread sheets, power point presentations using the Microsoft suite of office tools.

ii. This will help students to develop accurate and well-designed documents.

iii. To familiarize the students in managing database with Microsoft Access.

Course Outcomes:

After successful completion of this course, students should be able to:

i. To prepare well designed documentation.

ii. To create, modify format and print document using MS Word.

iii. To design pages using different page layouts.

iv. To work with a Spreadsheet, Charts and perform basic calculations.

v. To create effective presentations using power point.

vi. To apply animations and themes to enhance the looks of the Presentation.

vii. To design a database with related tables using MS Access.

Unit I: Introducing Windows 10	NOS	Hours
Windows concepts and Features, Windows Structure, Desktop, Taskbar, Start Menu, My Computer, Creating, Copying, Moving and Deleting files, Recycle Bin, Windows Accessories-Calculator, Notepad, Paint, WordPad, Using Scanner, System Tools, Basic DOS Commands	SSC/9004	10
Unit II Word Processing Part-I	NOS	Hours
Introduction to MS Word, Features of MS Word, Creating Opening and editing documents, Menus and Toolbars, Keyboard shortcuts, Formatting text and paragraph, Find and Replace, AutoText, Auto Correct, Envelopes and labels	SSC/9004	6
Unit III: Word Processing Part-II	NOS	Hours
Numbers and bullets, Page Layouts, Working with Tables,	SSC/9004	14

Inserting mathematical formulae, Graphics and Frames, Converting a word document into various formats like- Text, Rich Text format, PDF, Mail Merging, Table of Content, Insert End Note and Foot Note, Insert Table of Figures		
Unit IV: Working with Workbook and Spreadsheet	NOS	Hours
Creating and Opening Workbooks, Compatibility mode, Saving and Sharing Workbooks, Exporting workbooks, Cell Basics, Formatting Cells, Modifying Columns, Rows and Cells, Formulas and Functions, Working with Data, Working with Charts, Printing Workbooks	SSC/9004	10
Unit V: Designing Presentation	NOS	Hours
Getting Started with PowerPoint, Working with Slides, Working with Headers, Footers, and Notes, Inserting and Formatting Pictures, Formatting Text, Displaying the Presentation Outline, Inserting Charts, Tables, Videos, Audios and Objects, Arranging Slides, Adding Slide Transitions, Using animations.	SSC/9004	10
Unit VI: Database Management with MS Access	NOS	Hours
Creating a New Database, Creating Tables, Working with Forms, Creating queries, Finding Information in Databases, Creating Reports, Types of Reports, Printing & Print Preview, Importing data from other databases viz. MS Excel.	SSC/9004	10

References:

1. EXCEL 2007 Made Simple by Satish Jain, BPB
2. Word 2007 by Rutkosky, BPB 3
3. PowerPoint 2007 Made Simple by Satish Jain, BPB
4. Mastering EXCEL 4 for Windows - Chester – BPB
5. Learning Microsoft Office 2010, Lisa Bucki, Chirsty Parish, SuznneWeixel

B. Voc. in Programming Skills for Software Development

B. Voc. F. Y. (Semester I)

BVOC.1.07 Lab 1: Programming Language Concepts

Learning Objectives:

i. Programming Language Concepts course would enable the students in understanding Basics of Programming Languages and design & write the simple software applications using C programming.
ii. Learn how to design algorithms and flowcharts.
iii. Learn fundamental concepts of C Programming such as. Variables and constants, Operators, conditional and looping statements, Arrays, functions, structure and union, pointer, file handling etc.

Course Outcomes:

After successful completion of this course, students should be able to:

i. To design algorithms and flowcharts to solve any problems.
ii. To write software program to solve the given problem
iii. To use file handling for storing and processing data.
iv. To design program using graphics function in C

Lab Work/ Practical List

Programs for the demonstration of all the concepts in C Programming Language.

Following List should be covered after the Programs for the demonstration of concepts of C language.

1. Write a C program for the following:
   a) Swapping using third variable
   b) Swapping without using third variable

2. Write a C program to find Largest of the three Number using ternary operator.
3. Write a C program to print grade of the Students based on percentage as follows:
   >=80% -- Distiction
   >=60% -- First Class
   >=40% -- Pass Class
   Otherwise -- Fail
4. Write a C program to Check whether given number is Armstrong Number.
5. Write a C program to convert given number into word format using switch control Structure
   e.g. 123 >>>OneTwoThree
6. Write a C program to print all prime Number between 1 to n.

7. Write a C program to Print given Pattern:
 1>>>
 2>>>
 3>>>

8. Write a C program to find sum series: 1/1! - 2/2! + 3/3! - 4/4! .....N/N! .
9. Write a C program to find GCD and LCM of the given numbers.
10. Write a C program to find smallest and largest of n numbers using Arrays.
11. Write a C program to sort n numbers using Arrays in ascending or descending order.
12. Write a C program to find Addition of the two Matrix.
13. Write a C program to find Multiplication of the two Matrix.
14. Write a C program to find Transpose of the Matrix.
15. Write a C program to find sum of the diagonal of the Matrix.
16. Write a C program to find sum of the digits of the Number with and without Recursion.
    With Recursion
    Without Recursion
17. Write a C program to find Fibonacci series using recursion.
18. Write a C program to count the Number of the vowels and consonants in the String.
19. Write a C program by using Structure to display the information of the students. it include roll no.(int) , Name(char) , Gender(char) , fees(float).
20. Write a C program to swap two numbers using Call by Reference And call by value.
    Call by Value
    Call by Reference

21. Write a C program to add two integer using Pointers.
    Using Function
    Without Using Function
22. Write a C program to count number of the Characters, words and lines in the txt file.
23. Write a C program to display the contents of file on screen.
24. Write a C program to copy contents of one file to another.
25. 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.
26. Write a C program to write all the members of an array of structures to a file using fwrite(). Read the array from the file and display on the screen.
27. Write a C program to sort n strings using Arrays in ascending or descending order
28. Write a Program to draw basic graphics construction like line, circle, arc, ellipse and rectangle.
29. Write a Program to draw animation using increasing circles filled with different colors and patterns.
30. Program to make screen saver in that display different size circles filled with different colors and at random places.
31. Write a Program to make a moving colored Airplane/car using inbuilt functions.
32. Write a C Program to Remove Characters in String except Alphabets
33. Write a program in C to print individual characters of string in reverse order

34. Write a program in C to count total number of alphabets, digits and special characters in a string

35. Write a C program to check whether a given substring is present in the given string

36. Write a program in C to convert a string to lowercase

37. Write a program in C to make such a pattern like right angle triangle with a number which will repeat a number in a row.

The pattern like :

1

22

333

4444

38. Write a program in C to make such a pattern like right angle triangle with number increased by 1

The pattern like :

1

2 3

4 5 6

7 8 9 10

39. Write a program in C to make such a pattern like a pyramid with numbers increased by 1. Go to the editor

1

2 3

4 5 6

7 8 9 10

40. Write a program in C to make such a pattern like a pyramid with an asterisk. Go to the editor

*

* *

* * *

* * * *

41 Write a C program to reverse the digits of a given integer.

42**.** Write a C program to check whether an integer is a palindrome or not. An integer is a palindrome when it reads the same forward as backward

References:

1. Let us C-YashwantKanetkar.
2. Programming in C- Balguruswamy
3. The C programming Lang., Pearson Ecl – Dennis Ritchie
4. Structured programming approach using C- Forouzah&Ceilberg Thomson learning publication.
5. Pointers in C – YashwantKanetkar

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BVOC.1.08 Lab 2: Office Automation

Learning Objectives:

i. Office Automation course would enable the students in crafting professional word
ii. documents, excel spread sheets, power point presentations using the Microsoft suite of office tools.
iii. This will help students to develop accurate and well-designed documents.
iv. To familiarize the students in managing database with Microsoft Access.

Course Outcomes:

After successful completion of this course, students should be able to:

i To prepare well designed documentation.
ii To create, modify format and print document using MS Word.
iii To design pages using different page layouts.
iv To work with a Spreadsheet, Charts and perform basic calculations.
v To create effective presentations using power point.
vi To apply animations and themes to enhance the looks of the Presentation.
vii To design a database with related tables using MS Access.

Lab Work/ Practical List

Task 1Create project certificate Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colours, Inserting Header and Footer, Using Date and Time option in Word.

Task 2:Creating project Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Task 3:Creating a Newsletter: Features to be covered: - Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs

Task 4:Creating a Feedback form - Features to be covered- Forms, Text Fields, Inserting objects, Mail Merge in Word.

*Tasks to be completed using **MS Excel***

Task1: Creating a Scheduler - Features to be covered: Gridlines, Format Cells, Summation, auto fill, formatting Text.

Task 2: Calculations - Features to be covered:- Cell Referencing, Formulae in excel – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VOOKUP

Task 3: Performance Analysis - Features to be covered: - Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

*Tasks to be completed using **MS Power Point***

Task1: Students will be working on basic power point utilities and tools. Topic covered includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows

Task 2: Concentrating on the in and out of Microsoft power point. Topics covered includes: - Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc.), and Inserting – Background, textures, Design Templates, Hidden slides. Auto content wizard, Slide Transition, Custom Animation, Auto Rehearsing

Task 3: Power point test would be conducted. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

*Tasks to be completed using **MS Access***

Task 1: Creating Student's address Database and then list the data on the screen in alphabetical order and performing various queries.

Task 2: Generating Query in Access

Task 3: Generating the Report from Database and Importing and exporting data

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BVOC.1.09 Lab 3: Software Engineering and Testing

Learning Objectives:

i To develop software engineering skills and testingplans.
ii To understand system concepts and its application in Softwaredevelopment.
iii To enhance skills of designing and testingsoftware.
iv To learn technical skills to assure production of qualitysoftware.

Course Outcomes:

i Ability to learn various methods of software development.
ii Ability to apply various software testing techniques

Lab Work/ Practical List

1) Develop requirement specification of our project
2) Develop DFD model(level-0,level-1 dfd and data dictionary of the project
3) Develop UML use case model for a problem
4) Develop sequence diagram
5) Develop class diagram
6) Take any system(e.g. ATM system) and study its system specification and report the various bugs
7) Write the any test case for any known application(e.g. banking system)
8) Create a test plan document for any application(library mgmt. system)
9) Study of any testing tool (e.g. winrunner)
10) Study of any testing tool(e.g. selenium)
11) Study of any bug tracking tool (e.g. Bugzilla,bugbit)
12) Study of any Test management tool (e.g. test director)
13) Study of any Open source testing tool (e.g. test link)

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BVOC.2.01 Practical English Part II

Course Objectives:

1. To make a comprehensive use of English in day-to-day life.
2. To help Students develop the ability to learn and contribute critically.
3. To develop the writing skills of the students.
4. To help the students to understand the basic usages of English.

Course Outcome:

By the end of this course students should be able to:

1. Understand and demonstrate Basic English usages for their different purposes.
2. Clear entrance examination and aptitude tests.
3. Write various letters, reports required for professional life.

Unit-1: Morphology	NOS	Hours
Morphology: Free & Bound Morphemes, Word Formation Processes, Morphological Analysis of words	SSC/N9001	10
Unit-2: Grammar in day-to-day use:	NOS	Hours
Word Classes: Open and Closed Word Classes, Phrase: Types and functions of the phrases	SSC/N9001	
Unit-3: Auxiliary Verbs	NOS	10
Verbs: Primary Auxiliary and Secondary Auxiliary, Usages and Functions of modal auxiliaries, Questions using Model Auxiliaries	SSC/N9001	
Unit-4: Transformation of Sentences	NOS	Hours
Voice: Active & Passive, Speech: Direct & Indirect	SSC/N9001	10
Unit-5: Error Detection	NOS	Hours
Determiners: Article, Quantifiers and Demonstratives, Subject – Verb Agreement	SSC/N9001	10
Unit-6: Tenses and their usages	NOS	Hours
Simple Present, Simple Past, Simple Future	SSC/N9001	10

Reference Books

1. Modern English Grammar-L. S. Deshpande (creative Publication)
2. A Practical English Grammar- A. J. Thomson. (Oxford University)
3. Macmillan Foundation English. - R. K. Dwivedi& a. Kumar (Mammalian India Ltd)
4. Writing English for You- G. Radhakrishna Pillai (Emerland Publication)
5. High School English Grammar & Composition - Wren & Martin (S. Chand)
6. Radiance Communication Skills- Editorial Board (SRTM University) Orient Black Swan.
7. English Grammer and Composition – Rejendra Pal and PremLataSuri (Sultan Chand and Sons)

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BVOC.2.02 Data Analysis and Discrete Mathematics

Learning Objectives:

i. Practicing Basics of mathematics
ii. Use of Numbers
iii. This course enables students to develop their ability to reason by introducing them to elements of reasoning
iv. Basics knowledge of different types of set mathematical logic relations and probability.

Course Outcomes:

i. Develops problem solving skills of student
ii. Improves Basic and advanced calculations used in day to day life.
iii. Improves basics mathematics and statistics
iv. Construct a logically sound and well-reasoned argument.

Unit-1: Set,	NOS	Hours
Meaning, Types of Set, Sub Set, Equity of Set, Operation on Set, Venn diagram, Problems on Set	SSC/N9001	10
Unit -2 : Mathematical Logic	NOS	Hours
Proposition & Logical Operations, Truth Tables, Equivalence, Implications, Law of Logic, Predicates & Quantifier	SSC/N9001	
Unit -3: Relation	NOS	10
Meaning, Types of Relation, Operation on Relation, Function, Types of Function,	SSC/N9001	
Unit -4 : Frequency Distribution	NOS	Hours
Introduction of Statics, Meaning of Data, Descript Variates, Continuous Variates, Formation of Frequency Distribution,	SSC/N9001	10
Unit -5: Measure of Central Tendency Arithmetic Mean, Median, Mod-Definitions & Calculations, Quartile, Deciles& Percentile, Definitions & Calculations,	NOS	Hours
	SSC/N9001	10
Unit -6: Probability	NOS	Hours
Definition, Random Experiment, Sample Space, Events, Definition of Probability, Examples on Probability	SSC/N9001	10

1. Statistical Method –S. P. Gupta 9th Edition, S. Chand Publication
2. Fundamental of Statics - S. C. Gupta, 6th Edition, Himalaya Publication.
3. Discrete Mathematical Structure- Y. N. Singh

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BVOC.2.03 Operating System

Learning Objectives:

i. Demonstrate a knowledge of process control, threads, concurrency, memory management Scheduling, I/O and files, distributed systems, security, networking.

ii. Understand the services provided by and the design of an operating system.

iii. Understand the structure and organization of the file system.

iv. Understand what a process is and how processes are synchronized and scheduled.

Course Outcomes:

After successful completion of this course, students should be able to:

i. Understand and analyse theory and implementation of: processes, resource control (concurrency etc.), physical and virtual memory, scheduling, I/O and files

ii. Use system calls for managing processes, memory and the file system.

iii. describe, contrast and compare differing structures for operating systems

iv. Understand the data structures and algorithms used to implement an OS.

Unit I: Overview of Operating System	NOS	Hours
What is an OS, Brief history, Architecture, Goals & Structures of O.S, Basic functions, Interaction of O. S. & hardware architecture, System calls, Batch, multiprogramming. Multitasking, time sharing, parallel, distributed & real -time O.S.	SSC/ N0503	8
Unit II Process Management	NOS	Hours
Process Concept, Process states, Process control, Threads, Uniprocessor Scheduling: Types of scheduling: Pre-emptive, Non pre-emptive, Scheduling algorithms: FCFS, SJF, RR, Priority, Thread Scheduling, Real Time Scheduling. System calls like ps, fork, join, exec family, wait.	SSC/ N0501	10
Unit III: Concurrency control	NOS	Hours
Concurrency: Principles of Concurrency, Mutual Exclusion: S/W approaches, H/W Support, Semaphores, pipes, Message Passing, signals, Monitors, Classical Problems of **Synchronization**: Readers-Writers, Producer Consumer, and	SSC/ N0501	10

Dining Philosopher problem. **Deadlock**: Principles of deadlock, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, System calls like signal, kill.		
Unit IV: Memory Management	NOS	Hours
Memory Management requirements, Memory partitioning: Fixed and Variable Partitioning, Memory Allocation: Allocation Strategies (First Fit, Best Fit, and Worst Fit), Fragmentation, Swapping, and Paging. Segmentation, Demand paging **Virtual Memory:** Concepts, management of VM, Page Replacement Policies (FIFO, LRU, Optimal, Other Strategies), Thrashing.	SSC/ N0501	10
Unit V: I/O management & Inter Process Communication	NOS	Hours
I/O Devices, Organization of I/O functions, Operating System Design issues, I/O Buffering, Disk Scheduling (FCFS, SCAN, C-SCAN, SSTF), RAID, Disk Cache. Basic Concepts of Concurrency, Cooperating process, Advantage of Cooperating process, Bounded- Buffer - Shared-Memory Solution, Inter-process Communication (IPC), Basic Concepts of Inter-process Communication and Synchronization	SSC/ N0501	10
Unit VI: Multi-Processor Based and Virtualization Concepts	NOS	Hours
Virtual machines; supporting multiple operating systems simultaneously on a single hardware platform; running one operating system on top of another. Reducing the software engineering effort of developing operating systems for new hardware architectures. True or pure virtualization. Para virtualization; optimizing performance of virtualization system; hypervisor call interface. Basics of Network Operating System, Server Operating System and Real Time Operating System	SSC/ N0501	12

References:

Reference Books:

1. Operating System Concepts by Abraham Silberschatz, Peter B. Galvin, Greg Gagne.
2. Modern Operating Systems by Andrew Tanenbaum, Prentice Hall.
3. Operating Systems by William Stallings Prentice Hall
4. Fundamentals of Operating Systems by A.M. Lister, Macmillan

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BVOC.2.04 Web Technology

Learning Objectives:

i. To impart basic Web Designing skills.
ii. To provide the in-depth knowledge about Static and Dynamic Web Designing and make them ready for designing such websites
iii. Develop the modern Web applications using the client and server side technologies and the web design fundamentals

Course Outcomes:

i. Describe the concepts of WWW including browser and HTTP protocol.
ii. List the various HTML tags and use them to develop the user friendly web pages.
iii. Define the CSS with its types and use them to provide the styles to the web pages at various levels.
iv. Develop the modern web pages using the HTML and CSS features with different layouts as per need of applications.
v. Use the JavaScript to develop the dynamic web pages.
vi. Use server side scripting with PHP to generate the web pages dynamically using the database connectivity.

Unit I: Introduction to Web Technology	NOS	Hours
Internet and WWW, HTTP Protocol : Request and Response, Web browser and Web servers, Features of Web 2.0, Concepts of effective web design, Web design issues including Browser, Bandwidth and Cache, Display resolution, Look and Feel of the Website, Page Layout and linking, User centric design, Sitemap, Planning and publishing website, Designing effective navigation	SSC/N0501	10
Unit II HTML	NOS	Hours
Basics of HTML, formatting and fonts, commenting code, color, hyperlink, lists, tables, images, forms, XHTML, Meta tags, Character entities, frames and frame sets, Browser architecture and Web site structure. Overview and features of HTML5	SSC/N0501	
Unit III: Style sheets	NOS	10

Style sheets : Need for CSS, introduction to CSS, basic syntax and structure, using CSS, background images, colors and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, positioning using CSS, CSS2, Overview and features of CSS3	SSC/N0501	
Unit IV: JavaScript	NOS	Hours
Client side scripting with JavaScript, variables, functions, conditions, loops and repetition, Pop up boxes, Advance JavaScript: Javascript and objects, JavaScript own objects, the DOM and web, browser environments, Manipulation using DOM, forms and validations, DHTML : Combining HTML, CSS and Javascript, Events and buttons	SSC/N0501	10
Unit V: XML	NOS	Hours
Introduction to XML, uses of XML, simple XML, XML key components, DTD and Schemas, Using XML with application. Transforming XML using XSL and XSLT	SSC/N0501	10
Unit VI: PHP and MySQL	NOS	Hours
PHP : Introduction and basic syntax of PHP, decision and looping with examples, PHP and HTML, Arrays, Functions, String, Form processing, Date and Time Functions, Sending Email, Files, Cookies and Sessions, Connecting to MySQL and Selecting the Database, Executing Simple Queries, Retrieving Query Results, Ensuring Secure SQL, Counting Returned Records, Updating Records with PHP	SSC/N0501	10

References:

1. Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India
2. Web Technologies, Black Book, Dreamtech Press
3. HTML 5, Black Book, Dreamtech Press
4. Web Design, Joel Sklar, Cengage Learning
5. Developing Web Applications in PHP and AJAX, Harwani, McGrawHill
6. Internet and World Wide Web How to program, P.J. Deitel& H.M. Deitel, Pearson
7. HTML The complete Reference -2nd Edition Thomas A Powel Tata McGraw Hill publication
8. The complete Reference (HTML & XHTML)-5th Edition Thomas A Powel Tata McGraw Hill publication
9. Computer Fundamental s (6th Edition) P. K. Sinha BPB Publication

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BVOC.2.05 Graphics Design and Content Management Tools

Learning Objectives:

i. Create, manipulate, and edit text and graphics to obtain desired graphical outcomes.
ii. Define a relational database management system (RDBMS) and describe its structure.
iii. Define data definition language (DDL) and data manipulation language (DML).
iv. Provide the skills to effectively create and operate WordPress sites.

Course Outcomes:

After successful completion of this course, students should be able to:

i. Utilize several Flash tools and tactics learned throughout the course to produce an interactive flash based website.
ii. Publish flash movies in numerous formats and contexts in a professional and web friendly manner.
iii. Know types of databases and how to design them.
iv. Know advanced queries and advanced concepts in MySQL.
v. Plan website by choosing colour schemes, fonts, layouts, and more.
vi. Select, install, and activate a theme in word press.
vii. Design e-commerce site using woo commerce plugin.

Unit I: Getting Started with Flash	NOS	Hours
Create Flash movie file, Draw the characters and background, Basic drawing tools i.e. Pencil, Brush, Paint Bucket, and Text tools, Previewing and Publishing Movie, Scenes, Layers, and Library Symbols, Frames, Tweening, and Onion Skinning, Creating Curves, Importing Illustrator/Photoshop Files, Understanding Blend Effects	SSC/ N0503	8
Unit II Advanced Drawing Techniques	NOS	Hours
Animating 3D motion, Articulated Motion with Inverse Kinematics, Constraining Joints, Inverse Kinematics with Shapes, Designing a Layout, Creating Buttons and Actions, Creating Event Handlers, Using Sounds, Using Adobe Media Encoder, Playback of External Video, Working with Video and Transparency, Embedding Flash Video, Using Components,	SSC/ N0503	12

Creating Masks, Adding Metadata, Publishing Movie for the Web		
Unit III: RDBMS with MySQL	NOS	Hours
Introduction to database, Features of MySQL, Basics of Relational Databases, Creating and Selecting a Database, Creating a Table, Loading Data into a Table, Modifying and Deleting Data from Table, Retrieving Information from a Table, Selecting All Data, Selecting Particular Rows, Selecting Particular Columns, Sorting Rows, Date Calculations, Working with NULL Values, Pattern Matching, Counting Rows, Using More Than one Table, Getting Information About Databases and Tables, Creating Sequence, Database Backup and Restore	SSC/ N0501	10
Unit IV: Website Development using WordPress	NOS	Hours
Installing WordPress, Installing Themes, Creating a Child Theme, Modifying a Theme, Setting Up a WordPress Site, Starting the MRP Theme, The WordPress Loop, Continuing with the Loop, Splitting the Page into Templates, Creating a Page for Single Posts, Creating Pages, Customizing the Navigation Menu, Customizing the Sidebar, Creating a Custom Page Template, Adding a Contact Form, Uploading a WordPress Site	SSC/ N0501	10
Unit V: Advanced WordPress Concepts	NOS	Hours
What are plugins? Finding plugins, Installing plugins, Activating and deactivating plugins, Editing plugin settings, Deleting plugins, Adding, editing, and deleting users, User roles and permissions, Importing content from another site, Exporting your WordPress data, WordPress General settings, Changing the site title and tagline, Changing your URL, Using a different homepage, Updating the admin email address, Changing time zones Date/Time formats	SSC/ N0501	10
Unit VI: Woo Commerce Plugin	NOS	Hours
Introduction to Woo Commerce, Woo Commerce installation, Convert HTML to Woo commerce using [short-code], Recent Products, Featured Products, Variable Products, Woo commerce Settings, Payment Gateway Integration, Moving woo commerce site from Local Server to Live Server	SSC/ N0501	10

References:

Reference Books:

1. Adobe Flash Professional CS6 Classroom in a Book by Adobe Creative Team
2. Exploring Adobe Flash CS4-Annesha Hartman, Cengage Learning Publication
3. MySQL Explained by Mr. Andrew Comeau, CreateSpace Independent Publishing Platform
4. Professional WordPress: Design and Development by Brad Williams, David Damstra, Hal Stern
5. WordPress To Go bySarah McHarry.
6. WooCommerce Explained by Stephen Burge

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BVOC.2.06 Desktop Publishing

Learning Objectives:

i. To understand the fundamentals & concepts of Page Maker, Coreldraw, Photoshop
ii. To give the students a hands on experience on Page Maker, Coreldraw, Photoshop
iii. To give students the skills to create book works, building booklets.

Course Outcomes:

i. Ability to learn various methods of Pagemaker, Coreldraw, Photoshop
ii. Ability to apply various Desktop Publishing

Unit I: Page Maker: An overview	**NOS**	**Hours**
Introduction to page maker, Creating & opening publications , using the tool box, working with Palettes, text & Graphics, Starting a publication from a template, saving & closing a publication		10
Unit II: Drawing & Shaping Objects	**NOS**	**Hours**
Positioning ruler guides, typing text, formatting graphics, creating columns, creating styles, changing type style & alignment , rotating & moving of text block & graphics , placing text file, setting tab, indents, leaders, copying graphic between publications , positioning & resizing the logo, Setting up pages, Changing document setup, using master pages, choosing a measurement system & setting up rulers, adjusting layout, numbering pages, rearranging pages, creating running header & footers , importing text, threading text blocks, balancing columns, edit story, customizing the dictionary, hyphenation, layers, frames, locking object, wrapping text around graphics, cropping a graphic		08
UNIT-III: Working in Photoshop	**NOS**	**Hours**

Getting Acquainted with Photoshop , Basic Image Manipulation , Color Basics Painting Tools ,Brush Settings , Making Selections ,Filling and stroking , Layers ,Advanced Layers ,Text ,Drawing ,Using Channels and Masking ,Manipulating images ,Getting to know the work area ,Using Adobe Bridge , Basic Photo Corrections ,Retouching and Repairing.		10
UNIT-IV: Designing using Photoshop	NOS	**Hours**
Working with selections , Layer Basics ,Masks and channels , Correcting and enhancing digital photographs , Topographic design , Vector drawing techniques , Advanced Layer techniques , Vector Composting , Creating Links within an image ,Creating rollover web visuals ,Animating GIF images for the web ,Producing and printing consistent color		14
UNIT-V: Introduction to Corel Draw	**NOS**	**Hours**
Getting started with Corel Draw, Introduction to Corel Draw, Drawing and Coloring, Mastering with Text, Text Tool Artistic and paragraph text, Applying Effects, Power of Blends Distortion,		8
UNIT-VI: Working with bitmap and web resources	**NOS**	**Hours**
Working with Bitmap Commands, Working with Bitmaps, Editing Bitmaps, Applying effects on Bitmaps, Printing Corel Draw- Web resources, Internet Tool bar, Setting your webpage, Exporting files, Creating buttons with rollover effects		10

References:

1. Adobe PageMaker 7.0 Classroom in a Book by Adobe Creative Team (Author), ISBN-13 : 978-0201756258,Item Weight : 692 gPaperback : 336 pages ISBN-10 : 0201756250,Publisher : Adobe; Pap/Cdr edition (25 October 2001)
2. Adobe PageMaker 7.0,by Kevin Proot,ISBN-13 : 978-0619109561,Publisher : Course Technology; Illustrated edition (1 December 2002)
3. Photoshop CC in Simple Steps, by DT Editorial Services (Author),ISBN-10 : 9388425243,Publisher : Dreamtech Press (1 January 2019)

4. CorelDRAW 2018 in Simple Steps, DT Editorial Services (Author),ISBN-10 : 9388425251,Publisher : Dreamtech Press (1 January 2018)

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BVOC.2.07 Lab 1: Web Technology

Learning Objectives:

i. To impart basic Web Designing skills.
ii. To provide the in-depth knowledge about Static and Dynamic Web Designing and make them ready for designing such websites
iii. Develop the modern Web applications using the client and server side technologies and the web design fundamentals

Course Outcomes:

i. Describe the concepts of WWW including browser and HTTP protocol.
ii. List the various HTML tags and use them to develop the user friendly web pages.
iii. Define the CSS with its types and use them to provide the styles to the web pages at various levels.
iv. Develop the modern web pages using the HTML and CSS features with different layouts as per need of applications.
v. Use the JavaScript to develop the dynamic web pages.
vi. Use server side scripting with PHP to generate the web pages dynamically using the database connectivity.

Lab Work/ Practical List

HTML

1. Write a HTML page to print Hello World in bold and italic font
2. Display various text formatting methods available in HTML.(i.e.<h1>,<b>,<u> etc…)

3. Create a HTML file using special characters.

4. Create a HTML file which displays 3 images at LEFT, RIGHT and CENTER respectively in the browser

5. Create a HTML file which contains hyperlinks

Table of Contents

By clicking on the link takes to the respective topic within the same page.

6. Create a HTML page as given below

List of Subjects

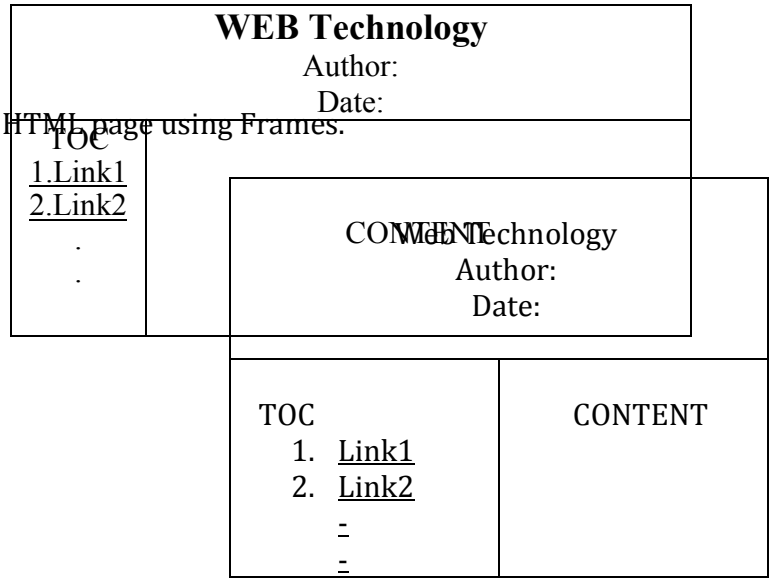
1. Computer EngineeringDepartment
   a. SoftwareEngineering
   b. InformationSecurity
   c. ComputerGraphics
2. Electrical EngineeringDepartment
   - ElectricalMachine
   - PowerElectronics
   - MicroController

3. Computer Engineering

Is a discipline that integrates several fields required to develop computer systems.

7. Create table with ROWSPAN and COLSPAN attribute of TABLEin HTML (Prepare timetable of your class).Include CELLSPACING & CELLPADDING

8. Create HTML page using Frames.



9. Create a simple form that will show all the INPUT METHODS available in HTML.

JAVA SCRIPT

10. Create simple application that will do following
    a. Declare And assign variable
    b. Operators and expression in JavaScript
    c. Looping in JavaScript
    d. Declare an Array
    e. User defined functions in JavaScript
    f. Built in functions in JavaScript
    g. Dialog boxes

11. For the form created in HTML provide various form values checking passed by user.

12. A document contains two forms, named specifications and accessories. In the accessories form is a field named acc1(type=text). Write two different statements that set the contents of that field to "New value".

13. Create a page that includes a select object to change the background color of the current page. The property that needs to be set is bgColor, Similar things for foreground color.

14. Put a button in "MAIN HTML" page, on click of that button, execute some JavaScript code that will open one child window. In the "MAIN HTML" page there should be one text field named "location" Inside "Child Window" put one Button. When this button of "Child Window" is clicked, it will write the Location value (URL) of "MAIN WINDOW" inside the LOCATION field of "MAIN WINDOW".

15. Scroll some message in Status window of browser.
16. Write down simple JavaScript using timeout such that image will be changed after every 1 ms at a specified position.

CSS

17. Practical based on the following attributes using
    CSS Color and background
    Font Text Border
    Margin and list

18. Practical based on use of external style sheet.

XML

19. Write an XML example of given tree that demonstrates the creation of user-designed tags and display it in a browser.
    college employee fname, lname, joindate, bdate, age, salary (with atleast 3

elements)

20. Write an XSL code for the above XML file that displays the information in a table structure.

21. Write a template file for the above code.

PHP

22. Understand the PHP interface. Study PHPMyAdmin.

23. Write a PHP script to create a database StudentDB.

24. Write a PHP script to list all the databases available in mysql.

25. Write a PHP script to list all the tables available in a particular database.

26. Write a PHP script to create a table student in the database StudentDB.

27. Write a PHP script to insert a row into the table student. The values to be inserted are taken from a HTML page.
28. Write a PHP script to alter student table. For ex: modify sname by increasing its length.

29. Write a PHP script to list all the records in the student table in tabular format.

30. Write a PHP script to delete all rows from student table whose roll numbers are between 1 and 3.

31. Write a PHP script to drop the table student and drop the database StudentDB.

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BVOC.2.08 Lab 2: Graphics Design and Content Management Tools

Learning Objectives:

i. Create, manipulate, and edit text and graphics to obtain desired graphical outcomes.
ii. Define a relational database management system (RDBMS) and describe its structure.
iii. Define data definition language (DDL) and data manipulation language (DML).
iv. Provide the skills to effectively create and operate WordPress sites.

Course Outcomes:

After successful completion of this course, students should be able to:

i. Utilize several Flash tools and tactics learned throughout the course to produce an interactive flash based website.
ii. Publish flash movies in numerous formats and contexts in a professional and web friendly manner.
iii. Know types of databases and how to design them.
iv. Know advanced queries and advanced concepts in MySQL.
v. Plan website by choosing colour schemes, fonts, layouts, and more.
vi. Select, install, and activate a theme in word press.
vii. Design e-commerce site using woo commerce plugin.

Lab Work/ Practical List

*Tasks to be completed using **Macromedia Flash***

Task 1 Create a movie in Flash using the concept of Masking.
Task 2: Create a movie in Flash using the concept of Motion Guide.
Task 3: Create a movie in Flash using the concept of Onion Skinning.
Task 4 Create a movie in Flash using the concept of Blinking Text.
Task 5 Create a movie in Flash using the concept of Frame by Frame animation.

*Tasks to be completed using **MySQL***

Task 1: Write a MySQL statement to create a table named ECHARGE containing information of the customers using electricity produced by XYZ company, having the columns Customer's identification number (C_ID, distinct integer), Customer name

(CNAME, Character, variable width 20, not empty), Customer's address (C_ADDR, character, variable width, 30), type of connection (TYPE, character, of width 12, containing default entry 'RESIDENTIAL' should not be empty) and units consumed (UNITS, positive integer).

Task 2: There exist a table RAILWAYS with columns for Passenger number (PNR), Passenger name (PNAME), age (AGE), sex (SEX), boarding station (BSTN), destination (DSTN) and FARE (fare). Write MySQL query to do the following.

1. Display passenger name, age, boarding station and destination station.
2. Display names of the passenger whose age is greater than or equal to 65. 3. Delete the table RAILWAYS.

Task 3: There exist a table called RAIL containing the columns station number (SNO, numeric), date (DT, date), station name (SNAME, character) and amount collected (AMT, numeric). Write MySQL statements for the following

1) Display the station number, station name and minimum and maximum of the amount collected of each station.
2) Display station name, the total and average of the amount collected of each station.

Task 4: There exists a table called ATTEND containing the columns student name (SNAME, character), class (CLASS, character), division (DIV, character) and no. of lectures attended (TOTAL_LEC, numeric).

Write MySQL statements for the following

1) Add a new column for roll number (ROLL, integer) as first column the table.
2) Display all the rows arranged in ascending order of the student's name of the table.
3) Delete the column SNAME from the table.
4) Rename the table as 'ATTD REPORT'.

Task 5: There exists a table called SALARY containing Employee number (ENO, numeric, primary key) employee name (ENAME, character), age (AGE, numeric) and basic salary (BPAY).

Write MySQL query to display employee number, employee name, age and 'Bonus' to be calculated as 10% of basic salary for those employees whose basic salary is below the average basic salary.

Tasks to be completed using ***WordPress and Woo Commerce***

Task1: Develop e-commerce web application for online shopping of Organic Vegetables using WordPress and Woo Commerce plugin.

B. Voc. in Programming Skills for Software Development

B. Voc. F. Y. (Semester II)

BVOC.2.09 Lab 3: Desktop Publishing

Learning Objectives:

i. To understand the fundamentals & concepts of Page Maker, Coreldraw, Photoshop
ii. To give the students a hands on experience on Page Maker, Coreldraw, Photoshop
iii. To give students the skills to create book works, building booklets.

Course Outcomes:

i. Ability to learn various methods of Pagemaker, Coreldraw, Photoshop
ii. Ability to apply various Desktop Publishing

1) Using a logo provided by the teacher, measure and design it in a desktop publishing software, and then print it.

2) Draw a triangle with rounded corners and apply fill and stroke

3) Draw the following basic shapes:

(a). 5 cm by 7 cm rectangle.

(b). A circle with 6 cm radius.

(c). A hexagon

4) To Create a Label using PageMaker software.

5) Create a visiting card in PageMaker

6) Create a corner design in PageMaker

7) Create a border design in PageMaker

8) Open PageMaker andcreate a new magazine layout which includes the following setup options:

Page size - magazine narrow

Orientation tall

4 page spread

Numbering - Lower Roman

Margins 1.25 inches- top, and .75 inches - all other sides.

9) Draw a floral design or a cartoon motif in CorelDraw. for a bed sheet.

10) Design a top for Jeans with a printed logo at the front side.

11) Do the following

i) Draw multiple Rectangles and try vertical alignment.

ii) Try Grouping and Ungrouping of objects.

iii) Try rotation and skewing of objects.

iv) Try duplication of objects.

12) Create a Visiting Card project using CorelDraw. .

13) Design a 3D button for a Web Page using CorelDraw. .

14) Create artistic text and apply a Drop Shadow and adjust the Settings using Photoshop.

15) Create a text design in Photoshop

16) Create a logo design in Photoshop

17) Create a t-shirt design in Photoshop

18) Create a banner design in Photoshop

19) Create a nature background design in Photoshop

20) Create a background design in Photoshop

College of Computer Science and Information Technology, Latur
Department of Computer Science
Program Structure for
B. Voc. in Programming Skills for Software Development
B. Voc. S. Y. (Semester III + Semester IV)

Class	Course Code		Course Title	Lect. per week	No. of Credits	Marks ESC	Marks CE	Total Marks
SEMESTER – III								
.Vo c T. Y. B	General Education	BVOC.3.01	Core Java	4	4	75	25	100
		BVOC.3.02	Computer Network	4	4	75	25	100
		BVOC.3.03	Programming in C#	4	4	75	25	100
	Component Skill	BVOC.3.04	Programming in JavaScript	4	4	75	25	100
		BVOC.3.05	RDBMS with Oracle	4	4	75	25	100
		BVOC.3.06	Data Structure & Algorithm		4	75	25	100
		BVOC.3.07	Lab 1: Java	2	2	30	20	50
		BVOC.3.08	Lab 2: C#	2	2	30	20	50
		BVOC.3.09	Lab 3: JavaScript +RDBMS	2	2	30	20	50
				30				**750**
SEMESTER – IV								
T. Y. B. Voc.	General Education	BVOC.4.01	SQL Server	4	4	75	25	100
		BVOC.4.02	Bootstrapand JQuery	4	4	75	25	100
		BVOC.4.03	React JS	4	4	75	25	100
	Skill Component	BVOC.4.04	Advanced Java	4	4	75	25	100
		BVOC.4.05	Cryptography and Network Security	4	4	75	25	100
		BVOC.4.06	Compiler Designing	4	4	75	25	100
		BVOC.4.07	Lab 1: SQL Server +ReactJS	2	2	30	20	50
		BVOC.4.08	Lab 2: Bootstrap and JQuery	2	2	30	20	50
		BVOC.4.09	Lab 3: Advance Java	2	2	30	20	50
				30				**750**

B. Voc. in Programming Skills for Software Development

B. Voc. S. Y. (Semester III)

BVOC.3.01 Core Java

Learning Objectives:

i. To understand the basic concepts and fundamentals of platform independent object oriented language.
ii. To demonstrate skills in writing programs using exception handling techniques and java 8 features.
iii. To understand streams and efficient user interface design techniques.

Course Outcomes:

After successful completion of this course, students should be able to:

i. Use the syntax and semantics of java programming language and basic concepts of OOP.
ii. Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages
iii. Apply the concepts of Exception handling to develop efficient and error free codes.
iv. Use java standard API library to write complex programs

Unit I: Java Fundamentals	Hours
Java History, Java Architecture, Java Vs. C++, Java Program Structure, Command Line Arguments, Data Types, Variables, Operators, Flow Control Statements, Arrays	10
Unit II OOPS	12
Classes and Objects, static members, Constructors, Encapsulation, Inheritance, this and super keyword, Polymorphism, Garbage Collection	
Unit III: Abstraction and Packages	10
Abstract class and Abstract Methods, Interfaces, Final Keyword, System Packages, User defined Packages, static import	
Unit IV Exception Handling	Hours
Introduction to Exception Handling, Exception Types, Try and catch block, finally clause, throws and throw clause, user defined exceptions	10
Unit V: Strings and IO Streams	Hours

String and StringBuffer class, Introduction to IO streams, Byte Stream Classes, Character Stream Classes, IO operations, Object Serialization	10
Unit VI: Java 8 features	Hours
Lambda Expressions, Default Methods, static Methods in Interface, Functional Interfaces, Method References, Stream API, Parallel Array Sorting	8

References:

1. Java The Complete Reference 9th Edition, Herbert Schildt, McGraw Hill Education (India) Private Limited, New Delhi.
2. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI
3. Introduction to Java programming, By Y.DanielLiang,Pearson Publication
4. An introduction to Java programming and object oriented application development, R. A. Johnson-Thomson
5. Understanding OOP with Java, up dated edition, T.Budd, Pearson education.

B. Voc. in Programming Skills for Software Development

B. Voc. S. Y. (Semester III)

B.VOC.3.02 Computer Network

Learning Objectives:

i. Introduction fundamental concepts of computer networking. Learn how to design algorithms and flowcharts.
ii Introduce students with various concepts used in network.
iii Introduce various technologies and standards.
iv Allow the student to gain expertise in areas of .networking.

Course Outcomes:

After successful completion of this course, students should be able to:

i. Design, install, configure, troubleshoot and manage components of computer systems.
ii. Apply basic knowledge of Network Devices.
iii. Install, manage, and maintain LAN & WAN.
iv. Best Practices to design network setup.

Unit I: Introduction to Computer Network:	Hours
Definition of Network, Applications of Computer Networks, Network Types: LAN, MAN, WAN, Wireless Networks, Network Topologies- Bus, Star, Ring, Mesh and Tree.	10
Unit II Network Hardware and Transmission Media:	Hours
Network Interface Card, Hub, Switch, Router, Bridges, Repeaters and Gateways. Data Transmission Media: Guided Transmission Media Twisted Pair Cable, Coaxial Cable, Fiber Optic Cable and Unguided Transmission media: Infrared, Radio waves, Micro Waves and Satellite Communication,	
Unit III: Network Models and Services:	10
OSI Reference Model and TCP/IP Reference Model, OSI vs. TCP/IP, Connection Oriented and Connectionless services, Service Primitives: Listen, Connect, Receive, Send and Disconnect.	
Unit Multiplexing and Switching:	Hours
Multiplexing: Time Division Multiplexing and Frequency Division Multiplexing. Switching: Circuit Switching, Packet Switching and Message	10

Switching. Transmission Modes: Serial Transmission- Synchronous and Asynchronous Transmission and Parallel Transmission.	
Unit V: Network Standards and Protocols	Hours
Network standards: Ethernet, 10Base2, 10base5. Network Protocols: IP,FTP, HTTP, SMTP IP address- IPV4 and IPV6	10
Unit V: Internet	Hours
Internet: Internet verses Intranet, Internet Service Providers, E-mail – Architecture and Services ,WWW-Client side and Serve model URL, Search engine	10

References:

1. Douglas E. Comer , "Computer Networks and Internets with Internet Applications", PHI, 4th ed,2008
2. Eugene Blanchard, "Introduction to Networking and Data Communications"
3. H.Kim Lew , Steve Spanier , Tim Stevenson , Merilee Ford, " Internetworking Technology Handbook CISCO System", Cisco press, 4th Ed., 2003
4. Network Essential Notes GSW MCSE Study Notes
5. William R. Cheswick , "Firewalls and Internet Security", Addison-Wesley, 2nd Ed., 2004
6. Andrew S. Tannenbaum,"Computer Networks", (Third Edition), Prentice-Hall of India Pvt. Ltd, New Delhi.

B. Voc. in Programming Skills for Software Development

B. Voc. S. Y. (Semester III)

BVOC.3.03 Programming in C#

Learning Objectives:

i. To learn fundamental concepts of Windows Programming..

ii. To develop background knowledge as well as core expertise in C#..

iii. To understand the windows form creation and provide knowledge for creating windows applications.

Course Outcomes:

After successful completion of this course, students should be able to:

i. Review the fundamental concepts of Windows Programming in C#.Net

ii. Evaluate the logic of different programming concepts.

iii. Evaluate the techniques of application development in windows environment.

iv. To develop database connectivity application.

v. To evaluate different techniques to develop windows applications.

Unit I: Introduction		Hours
Introduction to .Net Technology & Framework , Net Architecture Common Language Runtime(CLR) Visual Studio and IDE Components Toolbar, Menu bar, Project explorer, Properties window, Form layout window, Object designer, Form designer Toolbox Intellisense Project Types Java vs C#		10
Unit II: Arrays and Functions		Hours
C# Function Parameter Passing - Call by Value & Call by Reference Out Parameter Array and ArrayList class Jagged Array String Class StringBuffer class		

Unit III: Windows Applications and Windows Controls		10
Important Classes Used in Windows Application Creating and Customizing Windows Form TextBox and Label Control Button, CheckBox and RadioButton ListBox and ComboBox control Menus and Dialog Boxes		
Unit IV :Namespace, interface & Exception handling		Hours
Creating & using Namespace(DLL library) Creating & using interface Exception Handling using Try and Catch Block Using Finally Block Custom Exception		10
Unit V: Properties, Indexers, Delegates & Events		Hours
Properties Indexers Delegates Multicast Delegates Custom Events		10
Unit VI: Database Connectivity		Hours
Introduction ADO.Net Advantages of ADO.Net Developing a Simple ADO.NET Based Application Retrieving & Updating Data From Tables Disconnected Data Access Through Dataset Objects		10

References:

1. Programming in C# E BalagurusamyMcGraw Hill
2. Visual C#.Net C MuthuMcGraw Hi

B. Voc. in Programming Skills for Software Development

B. Voc. S. Y. (Semester III)

BVOC.3.04 JavaScript

Learning Objectives:

I. Understand the JavaScript language & the Document Object Model.
II. Alter, show, hide and move objects on a web page.
III. Check information inputted into a form.
IV. Javascript allows programming to be performed without server interaction.
V. Javascript can respond to events, such as button clicks.
VI. Javascript can validate data before sending out a request.
VII. Javascript can adjust an HTML document for special effects.
VIII. Javascript can create cookies! Cookies can be used to store and retrieve information from the user's computer

Course Outcomes:

After successful completion of this course, students should be able to:

I. Students will be a Front-End website developer.
II. JavaScript ensures student to have a responsive, mobile-first website.
III. It paces up the development process by offering resources such as templates and themes, which can be customized according to the project needs.

Unit I: Overview to Javascript	Hours
What is JavaScript? The development workflow Selecting the right tools for the job Just enough HTML and CSS Understanding objects Understanding variables Making comparisons Understanding events	10
Unit II Introduction to JavaScript	12
Writing your first script Internal vs. external scripts Using comments in scripts Using the NoScript Creating alert dialogs Understanding conditional statements Getting confirmations from users Creating prompts for users	

Understanding functions Making links smarter Using switch/case statements Handling errors	
Unit III: JavaScript Language Essentials	10
Getting started Creating loops Passing values to functions Detecting objects Reading arrays Returning values from functions Writing arrays Building do and while loops Re-using functions	
Unit IV: Creating Rollovers and More	Hours
Creating a basic image rollover How to write a better rollover Creating a three-state rollover Making rollovers accessible and 508 compliant Making disjointed rollovers Creating slideshows Displaying random images	10
Unit V: Building Smarter Forms	Hours
Getting started Creating jump menus Creating dynamic menus Requiring fields Cross-checking fields Displaying more informative errors Verifying radio button selections Setting one field with another field Verifying email addresses	10
Unit VI: Handling Events and Cookies	Hours
Responding to window events Responding to mouse movements Responding to mouse clicks Responding to onBlur form events Responding to onFocus form events Responding to keyboard events The DOM, Nodes, and Objects Working with Dates and Times	8

References:

1 JavaScript: The Definitive Guide,David Flanagan, O'Reilly Media; 7th edition (14 May 2020),ASIN : B088P9Q6BB.

2 Eloquent JavaScript,MarijinHaverbake, 3rd Edition,ISBN-13: 978-1593279509

3 JavaScript: The Good Parts,DouglasCrockford,Shroff; First edition,ISBN-10 : 8184045220

B. Voc. in Programming Skills for Software Development

B. Voc. S. Y. (Semester III)

BVOC.3.05 RDBMS through Oracle

Learning Objectives:

1. To understand the features of Relational database.
2. To describe data models and schemas in DBMS.
3. To use SQL- the standard language of relational databases for database operations.
4. To understand the functional dependencies and design of the databases.

Course Outcomes:

1. To study the basic concepts of relational databases
2. Learn and practice data modeling using the entity-relationship and developing database designs.
3. Understand the use of Structured Query Language (SQL) and learn SQL syntax for writing queries.
4. Apply normalization techniques to normalize the databases.

Unit I: Introduction and Overview	Hours
a) Structure of DBMS b) Advantages and Disadvantages of DBMS c) Users of DBMS d) Relational Database: Entities, Attributes and Domains e) Tuples, Relations and theirschemes.	10
Unit II: SQL Statements & Working With Tables	Hours
a) What is SQL? b) Types of SQL Commands (DDL, DML, DQL, DCL, Transaction Control Commands (TCL) c) Data types in SQL d) Creating Tables e) Selecting from tables, WHERE Clause f) Selecting from tables, DISTINCT Clause, Column aliasing g) Manipulation Table data h) Altering Table structure i) Data Constraints: Unique, Not Null, Primary Key, Foreign Key, Check, Default Constraint	10
Unit III: Operators & SQL Functions & Views	14
a) Arithmetic Operators, Relational Operators b) Comparison Operators BETWEEN , IN, LIKE, IS NULL c) LOGICAL Operators: AND OR NOT d) SQL Functions: Single, Multiple Row Functions e) Single Row Character , Single Row Number, Single Row Date, Single Row Conversion, Single Row General Functions f) Multiple Row Functions g) Views	
Unit IV: Sorting & Grouping Data and Joining Tables & Subqueries in ORACLE	Hours

a) What is Sorting? b) ORDER BY & ORDER BY DESC Clauses c) GROUP BY & GROUP BY HAVING Clauses d) What is Join? Join Styles: Theta , ANSI , Using clause e) Types of Joins: Equi Joins, Non Equi Join, Outer Join: Left, Right, Full f) Self Join Cross Join, Joining three tables g) Subqueries & its types	8
Unit V: . Introduction to PL/SQL	Hours
a) PL/SQL Overview b) Declarations Section c) Executable Commands Section d) Exception Handling Section	6
Unit VI: Database Triggers & Cursors	Hours
a) What are Triggers? Triggers Syntax b) Types of triggers Row Level Statement Level, Before , After Instead of Triggers c) Enabling and Disabling Triggers Replacing and Dropping Triggers d) Working with Cursor % TYPE Variable % ROWTYPE Variable	12

References-

1. “Oracle Database 10g PL/SQL Programming” by Scott Urman , Ron Hardman, MichaleMc Laughlin, Oracle Press, TMH, ISBN-0-07-059779-0.
2. “Oracle Database 10g The Complete Reference” By Kevin Loney, Bob Bryla Oracle
3. SQL, PL/SQL the programming language of ORACLE 4th Edition by Ivan Bayross

B. Voc. in Programming Skills for Software Development

B. Voc. S. Y. (Semester III)

BVOC.3.06 Data Structure and Algorithm

Learning Objectives:

i. To teach the basic concepts of data structures and algorithms
ii. To understand concepts about searching and sorting techniques
iii. To understand basic concepts about stacks, queues, lists, trees and graphs
iv. To understanding about writing algorithms and step by step approach in solving problems
with the help of fundamental data structures

Course Outcomes:

After successful completion of this course, students should be able to:

i. Ability to analyze algorithms and algorithm correctness.
ii. Ability to summarize searching and sorting techniques
iii. Ability to describe stack, queue and linked list operation.
iv. Ability to have knowledge of tree and graphs concepts.

Unit I: Introduction and Overview	Hours
Introduction, Basic technology, elementary data organization, Data structure, Data structure operation, Notation and Concept of algorithm, Complexity: time space tradeoff	10
Unit II: Array, Searching and Sorting	Hours
Linear array ,Representation of linear array in memory , Traversing linear array , Inserting and Deleting , Searching methods (Binary and linear search), Sorting Method (selection sort, bubble sort and Insertion sort)	10
Unit III: Linked list	14
Linked list , Advantages of Linked list, Representation of Linked list in memory , Traversing a linked list ,Searching a linked list , Memory allocation, Garbage collection , Insertion into Linked List , Deletion from Linked List , Two way Linked List	
Unit IV Stack	Hours

Introduction, stack, Array Representation of stack, Linked Representation of stack, Push & pop operation, Arithmetic expression: Polish Notation, Infix, postfix & prefix notations, Evaluation of postfix expression , Recursion :factorial, Fibonacci	8
Unit V: Queue	Hours
Introduction, Queues, Linked Representation of Queue, Insertion & Deletion on Queue. , D-queue, Priority Queue.	6
Unit VI: Tree and Graph	Hours
Binary Trees, Tree Terminology, Representation of Binary Tree in Memory, Types of Binary tree , Traversing of binary tree(pre-order, post-order, in-order) , Header Nodes :Threads , Graph Theory Terminology, Sequential Representation of graph	12

References:

1. Data Structure, By Seymour Lipschutz (Schaum'sOuline Series Incomputers) – Mcgraw Hill.
2. An Introduction To Data Structurewith Application By Jeanpaul, Tremblay Paul, G. Sorenson (Tatamcgraw Hill)

B. Voc. in Programming Skills for Software Development

B. Voc. S. Y. (Semester III)

BVOC.3.07 Lab 1: Core Java

Learning Objectives:

i. To understand the basic concepts and fundamentals of platform independent object oriented language.

ii. To demonstrate skills in writing programs using exception handling techniques and java 8 features.

iii. To understand streams and efficient user interface design techniques.

Course Outcomes:

After successful completion of this course, students should be able to:

i Use the syntax and semantics of java programming language and basic concepts of OOP.

ii Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages

iii Apply the concepts of Exception handling to develop efficient and error free codes.

iv Use java standard API library to write complex programs

Lab Work/ Practical List

Programs for the demonstration of all the concepts in Java Programming Language.

1. Write a Java program that works as a simple calculator.
2. The Fibonacci sequence is defined by the following rule. The first 2 values in the sequence are 1, 1. Every subsequent value is the sum of the 2 values preceding it. Write a Java program that uses both recursive and non-recursive functions to print the nth value of the Fibonacci sequence?
3. Write a Java program that prompts the user for an integer and then prints out all the prime numbers up to that Integer?
4. Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome?
5. Write a Java program for sorting a given list of names in ascending order?
6. Write a Java program to multiply two given matrices?
7. Write a program to create a class Student with data ‘name, city and age’ along with method printData to display the data. Create the two objects s1, s2 to declare and access the values.
8. Write a java program for Method overloading and Constructor overloading.
9. Write a java program to create an abstract class named Shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contain only the method printArea( ) that prints the area of the given shape.

10. Write a java program that checks whether a given string is palindrome or not
11. Write a java program to implement Interface using extends keyword.
12. Write a java program to create user defined package.
13. Write a java program for creating multiple catch blocks.
14. Write a java program to represent ArrayList class.
15. Write a Java program that displays the number of characters, lines and words in a text?

References:

1. Java The Complete Reference 9th Edition, Herbert Schildt, McGraw Hill Education (India) Private Limited, New Delhi.
2. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI
3. Introduction to Java programming, By Y.DanielLiang,Pearson Publication
4. An introduction to Java programming and object oriented application development, R. A. Johnson-Thomson
5. Understanding OOP with Java, up dated edition, T.Budd, Pearson education.

B. Voc. in Programming Skills for Software Development

B. Voc. S. Y. (Semester III)

BVOC.3.08 Lab 2: C#

Learning Objectives:

i. To impart the knowledge on basics concepts of object oriented programming.
ii. To provide the familiarity in the concept of developing window application.
iii. To converse an idea of creating application using ADO.Net.
iv. To convey the idea of CLR and .Net framework.

Course Outcomes:

After successful completion of this course, students should be able to:

i. To develop background knowledge as well as core expertise in C#.
ii. To understand the windows form creation and provide knowledge for creating windows applications.
iii. To learn the object oriented concepts.

Lab Work/ Practical List

Programs for the demonstration of all the concepts in Windows Programming.
Following List should be covered after the Programs for the demonstration of concepts of Windows Programming

1. Write a program for demonstration of creating simple windows application.
2 Write a program for demonstration of Text Box and Button control.
3 Write a program for demonstration of List Box and Combo Box Control.
4 Write a program for demonstration of designing Menus.
5 Write a program for demonstration of using dialog boxes.
6 Write a program for demonstration of C# functions.
7 Write a program for demonstration of Array.
8. Write a program for demonstration of creating custom namespace.
9. Write a program for demonstration of handling exception.
10. Write a program for demonstration of creating and using custom exception.
11. Write a program for demonstration of creating properties.
12. Write a program for demonstration of creating Indexers.
13. Write a program for demonstration of creating Delegates.
14 Write a program for demonstration of accessing data from database.
15 Write a program for demonstration of modifying data from database.

References:

1. Programming in C# E BalagurusamyMcGraw Hill

2. Visual C#.Net C MuthuMcGraw Hill

B. Voc. in Programming Skills for Software Development

B. Voc. S. Y. (Semester III)

Lab.3.09 JavaScript

Learning Objectives:

i To impart the knowledge on basics concepts of JavaScript.
ii To provide the familiarity in the concept of developing JavaScript Code.
iii To converse an idea of creating application using JavaScript.

Course Outcomes:

After successful completion of this course, students should be able to:

i To develop background knowledge as well as core expertise in JavaScript.
ii To understand the Dynamic form creation and provide knowledge for creating applications.
iii To learn the advanced JavaScript.

Lab Work/ Practical List

Programs for the demonstration of all the concepts in JavaScript.
Following List should be covered after the Programs for the demonstration of concepts of Windows Programming

1. Defining interactive response and performance to web pages

   *** JavaScript provides users to interact with web pages as per the below examples as per the requirements
2. Show/hide more data or user information using with the click of a button
3. Change the color of a button after hovering the mouse hovers over it
4. Slide by a carousel of images on the home webpage
5. Zooming in/zooming out feature on an image
6. Performing a timer and defining count-down on a website
7. Performing animation implementations
8. Using a drop-down interactive on menu
9. Performing audio and video on a web page

B. Voc. in Programming Skills for Software Development

B. Voc. S. Y. (Semester III)

Lab.3.09RDBMS

Learning Objectives:

1. To understand the features of Relational database.
2. To describe data models and schemas in DBMS.
3. To use SQL- the standard language of relational databases for database operations.
4. To understand the functional dependencies and design of the databases.

Course Outcomes:

1. To study the basic concepts of relational databases
2. Learn and practice data modeling using the entity-relationship and developing database designs.
3. Understand the use of Structured Query Language (SQL) and learn SQL syntax for writing queries.
4. Apply normalization techniques to normalize the databases.

Sr.No.	Title of Programme	Required Hours
1	What is SQL? Types of SQL Commands	3 hours
2	Study of Datatypes in ORACLE	3 hours
3	Creating Tables & Retrieving , Manipulating Data from tables	3 hours
4	Study of Altering Tables IN ORACLE	
5	Study of Data Constraints in ORACLE	3 hours
6	Study of Operators	3 hours
7	Study of SQL Functions	3 hours
8	Study of Views in ORACLE	3 hours
9	Study of Joining Tables in ORACLE	3 hours
10	Study of in PL/SQL Blocks in ORACLE	3 hours
11	Study of in Triggers in ORACLE	3 hours

Sr.No.	Name of Book	Author	Publication
1	Oracle Database 10g PL/SQL Programming	Scott Urman , Ron Hardman, MichaleMc Laughlin	By Oracle Press, TMH, ISBN-0-07-059779-0.

	2	Oracle Database 10g The Complete Reference	Kevin Loney, Bob Bryla	By Oracle Press (TATA McGraw Hill Edition) ISBN-13:978-0-07-059425-8, ISBN-10: 0-07-059425-2
3		SQL, PL/SQL the programming language of ORACLE 4th Edition	Ivan Bayross	ISBN-81-7656964-X

B. Voc. in Programming Skills for Software Development

B. Voc. S. Y. (Semester IV)

BVOC.4.01 SQL Server

Learning Objectives:

1. Microsoft SQL Server course would enable the students in understanding Basics of SQL and Database

i. Learn how to design Database
ii. Learn fundamental concepts of Relational databases
iii. Learn fundamental concepts of DDL, DML and DCL
iv. Learn Different Math, Aggregate, Date and String functions
v. Creating and Using View
vi. Learn how to Create database Procedures

Course Outcomes:

After successful completion of this course, students should be able to:

i. Learn how to Design database
ii. Learn to Build Relation among tables
iii. Understanding Constraints
iv. Understands Sub Queries
v. Creating Views
vi. Create and use Procedures, Triggers and Cursor
vii. Should able to take Backup and Restore of database.

Unit I: : Introduction to SQL Server to SQL	Hours
SQL Server Version history and different editions, Basic Features Components and Tools, Starting and Stopping SQL Server Instances / Services, Introduction to Management Studio, Types of System Databases in SQL, Basics of SQL Types of SQL Statements, DDL, DML, DQL, DCL and TCL, Create Database using Management Studio, Datatypes in SQL Server, Exploring DDL Statements on Table using Management Studio, Create, Alter and Drop Table Insert, Update and Delete Statement Truncate Statement	10
Unit II: Working with Queries (DQL)	Hours
Understanding Select Statement, Usage of Top, Distinct, Null etc...keywords, Using String and Arithmetic Expressions, Exploring Where Clause with Operators, Using Advanced Operators, Sorting data using Order By clause, Working with basic of Sub Queries, Using functions in Queries, Using Predefined Functions, Count, Sum, Min, Max, Avg Group By and Having Clause, Using Group By with Rollup and Cube	10
Unit III: Joins and Set Operations, Implementation of Data integrity and Constraints	10

Introduction to Joins Cross Joins, Inner Join, Outer Join ϖ Self Join, Co-related Sub Queries, Set Operations using Unions, Intersect and Except, Entity integrity Domain integrity Referential integrity, Types of constraints, Unique, Not NULL, Primary Key, Default Check Foreign Key	
UNIT IV :Implementing Views and Working with Indexes	Hours
Introduction & Advantages of Views, Creating, Altering, Dropping Views, Advance Options while Creating a View, SQL Server Catalogue Views, Introduction Clustered and Non Clustered Index, Creating and Dropping Indexes	10
Unit V: :Working with Stored Procedures, Functions and Triggers	Hours
Introduction to stored procedures ϖ Benefits of Stored Procedures ϖ Creating, Executing Modifying, Dropping ϖ Input–Output and Optional Parameters, System defined SP's and Functions. ϖ User defined Functions, Introduction to triggers ϖ Constraints vs Triggers, Creating, Altering, Dropping triggers, for/after/instead of triggers, Using Rollback Tran, Creating and using Cursors	10
Unit VI: Managing users and Backup and Restore	Hours
Creating Users & Roles, Granting & Revoking of Roles & privileges ϖ Managing using Management Studio, Generating SQL Script, Executing SQL Script, Generating Change Script, Taking database Backup, Restoring database using backup, Attaching and Detaching of database	10

References:

1. Pro ASP.NET Core 6: Develop Cloud-Ready Web Applications Using MVC, Blazor, and Razor Pages 9th ed. Edition -Adam Freeman
2. High Performance Enterprise Apps using C# 10 and .NET 6 Ockert J. du Preez
3. Programming ASP.NET Core Paperback – 1 January 2019 by Dino Esposito (Author)

B. Voc. in Programming Skills for Software Development

B. Voc. S. Y. (Semester IV)

BVOC.4.02 Bootstrap and JQuery

Learning Objectives:

i To understand the basic concepts and fundamentals of Bootstrap.

ii To Use Anybody with just basic knowledge of HTML and CSS can start using Bootstrap.

iii To Understand Bootstrap's responsive CSS which adjusts to phones, tablets, and desktops.

Course Outcomes:

After successful completion of this course, students should be able to:

i Students will be a Front-End website developer..

ii Bootstrap ensures student to have a responsive, mobile-first website.

iii It paces up the development process by offering resources such as templates and themes, which can be customized according to the project needs.

Unit I: Bootstrap Fundamentals	Hours
What is Bootstrap, Advantages of Bootstrap, Bootstrap Version, Bootstrap CDN, Containers:FixedContainer,FluidContainer,Responsive Containers	10
Unit II Bootstrap Components	12
Grid Basic, Typography, Colors, Tables, Images, Jumbotron, Alerts, Buttons, Button Groups, Badges, Progress Bars, Spinners, Pagination, List Groups	
Unit III: Bootstrap Advance Component	10
Cards, Dropdowns, Collapse, Navs, Navbar, Carousel, Modal, Tooltip, Popover Toast, Scrollspy, Offcanvas, Utilities, Flex	
Unit IV Bootstrap Forms	Hours
Forms, Select Menus, Checks and Radios, Range, Input Groups, Floating Labels Form Validation	10
Unit V: Bootstrap Grid	Hours
Grid System, Stacked/Horizontal, Grid XSmall, Grid Small, Grid Medium, Grid Large, Grid XLarge, Grid XXL, Grid Examples, Admin Panel, Filters, Breadcrumbs, Datepicker, Creating Basic Templates	10
Unit VI: JQuery	Hours
	8

jQueryIntro,jQuerySelectors,jQueryEvents,jQueryEffects,jQuery Hide/Show,jQueryFade,jQuerySlide,jQueryAnimate,jQuery stop(),jQueryCallback,jQueryChaining,jQueryHTML,jQueryGet,jQuerySet,jQuery Add jQueryRemove,jQuery CSS Classes,jQuerycss(),jQuery Dimensions	

References:

1 Mastering Bootstrap 4, Benjamin Jakobus, Packt Publishing Limited (6 January 2016), 285 pages, ISBN : 1783981121.

2 Bootstrap Reference Guide, Jacob Lett, Bootstrap Creative; Illustrated edition (3 April 2018), 104 pages, ISBN : 1732205833.

3 Mastering Bootstrap 4 - Second Edition, By Benjamin Jakobus , Jason Marah,Publisher-Packt,Pages-354,ISBN-9781788834902.

B. Voc. in Programming Skills for Software Development

B. Voc. S. Y. (Semester IV)

BVOC.4.03 React JS

Learning Objectives:

i React JS course would enable the students in understanding Basics of front end design & write the simple web development using React JS programming.

ii Learn how to design forms, web applications.

iii Learn fundamental concepts of React JS such as. State, Props, Operators, conditional and looping statements, Arrays, Arrow functions etc.

Course Outcomes:

After successful completion of this course, students should be able to:

i. To design front end applications.
ii. To write web application to solve the given problem
iii. To use GraphQL, Webpack, and server-side rendering
iv. To design program using java script.

Unit I: Introduction to JavaScript	Hours
Variables, Arrow functions, Rest and spread, Object and array destructuring,Template,literals,Classes,Callbacks,Promises,Async/Await,ES Modules	10
Unit II: Basics of React Concepts	Hours
what is react?, benefits of using react, first react code, creating component classes, working with properties, what is JSX, benefits, understanding JSX, React and JSX gotchas, React component states, working with states, states and properties, stateless components, Hooks	
Unit III: Styling and Hooks	10
CSS in React, Inline Styling, SAAS, What is HOOK?, useState, useEffect, useContext, useRef, useReducer, useCallback, useMemo, Custom Hooks	
Unit IV : working with forms and Menus	Hours

Defining a form and its events, form elements, form validations, Bulding menu with JSX, Bulding menu without JSX.	10
Unit V: React Architecture	Hours
Adding webpack to project, React router, router features, React Memo	10
Unit V: Redux	Hours
flux data architecture, redux data library, GraphQL	10

References:

1. React Quickly- AZAT MARDAN, ISBN 9781617293344, ©2017 by Manning Publications, Edition First.

2. Learning React-
Functional Web Development with React and Redux, Alex Banks and Eve Porcello, isbn=9781491954553 f, First Edition, O'Reilly.

B. Voc. in Programming Skills for Software Development

B. Voc. S. Y. (Semester IV)

BVOC.4.04 Advanced Java

Learning Objectives:

i To Design and build robust and maintainable web applications.

ii To create dynamic HTML content with Servlets and Java Server Pages, using the JSP Standard Tag Library (JSTL).

iii To Make Servlets and JSP work together cleanly.

iv To Access databases with JDBC and Hibernate.

Course Outcomes:

After successful completion of this course, students should be able to:

i. Create dynamic and interactive web sites and interaction with client and server.

ii. Do server side programming with java Servlets and JSP.

iii. Implement the web based applications using JDBC and Hibernate.

Unit I: Collection	Hours
ArrayList, Vector, Generics, Iterator, Comparable, TreeSet, HashSet, HashMap, HashTable, TreeMap	10
Unit II: Java Database Connectivity	12
JDBC Introduction, JDBC Architecture, JDBC Drivers, Establishing Connection, Executing Query and Processing Results, Metadata, Prepared Statement, Callable Statement	
Unit III Introduction to Servlets	8
Introduction to Servlets, Deploying Simple Servlet, Servlet Life Cycle, Get and Post Requests, Request Object	
Unit IV Handling Form Data	Hours
Accessing Data from HTML Form, Using JDBC in Servlet, Servlet Chaining, Cookies and Sessions	8
Unit V: JSP	Hours
Introduction to JSP, Scripting Elements- Expressions, Scriptlets, Declarations, Directives, Sessions in JSP, Using JDBC in JSP, JavaBeans in JSP	10
Unit VI Hibernate	Hours
Hibernate Introduction, Hibernate Architecture, Hibernate Session, Hibernate SessionFactory, Hibernate Configuration, The Persistence Life Cycle, Mapping, Mapping with Annotations, Hibernate Aggregation,	12

Hibernate Named Queries, Hibernate Native SQL, HQL- Hibernate Query Language	

References:

1 Java The Complete Reference 9th Edition, Herbert Schildt, McGraw Hill Education
2 (India) Private Limited, New Delhi.
3 Java Servlet & JSP Cookbook, Bruce W. Perry, O'Reilly Publication.
4 Beginning Hibernate: For Hibernate 5, Fourth Edition, Joseph B. Ottinger Jeff Linwood Dave Minter, APress Publication

B. Voc. in Programming Skills for Software Development

B. Voc. S. Y. (Semester IV)

BVOC.4.05 Cryptography and Network Security

Learning Objectives:

- To highlight the features of different technologies involved in Network Security.

Course Outcomes:

- After successful completion of this course, students should be able to:
- Student will be able to understand basic cryptographic a algorithms, message and web authentication and security issues.
- Ability to identify information system requirements for both of them such as client and server.
- Ability to understand the current legal issues towards information security.

Unit I:	Hours
Attacks, Services and Mechanisms, Types of Security Attacks, Security Services ,Principles of security,A model for Network security, The Need for Security.	10
Unit II	Hours
Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, stenography, key range and key size, possible types of attacks,Steganography.	
Unit III	10
Message Authentication Algorithms and Hash Functions: Authentication requirements, Functions, Message authentication codes, Hash Functions, Secure hash algorithm, Whirlpool, HMAC, CMAC, Digital signatures, knapsack algorithm **Authentication Applications:** Kerberos, X.509 Authentication Service, Public – Key Infrastructure, Biometric Authentication.	
Unit IV	Hours
E-Mail Security: Pretty Good Privacy, S/MIME IP Security: IP security overview, IP Security architecture, Authentication Header, Encapsulating security payload, Combining	10

security associations, key management.	
Unit V:	Hours
Web Security: Web security considerations, Secure Socket Layer and Transport Layer Security, Secure electronic transaction Intruders, virus and Firewalls: Intruders, Intrusion detection, password management, virus and related threats, Countermeasures, Firewall design principles, types of firewalls	10
Unit VI	Hours
Study Of Firewall And Network Security Configuration Introduction of Firewall, Types of Firewall, Configuring of Firewall, Open source Firewall, Importance of Firewall, Modem/Router Configuration, WI-FI Configuration, V-LAN Configuration, Proxy Server Configuration	10

References:

1. .Cyber Law in India by Farooq Ahmad – Pioneer Books ISBN No: 978-93-82417-01-9.
2. Ethical Hacking by AnkitFadia ISBN-13: 978-1931841726
3. Cryptography and network security by AtulKahate second edition
4.Cryptography and Network Security : William Stallings, Pearson Education,4″‘ Edition
5.Cryptography and Network Security : AtulKahate, McGraw Hill Edition

B. Voc. in Programming Skills for Software Development

B. Voc. S. Y. (Semester IV)

BVOC.4.06 Compiler Designing

Learning Objectives:

- To learn the process of translating a modern high-level language to executable machine Languagecode
- To learn different phases of compiler and how to implement them.
- To learn efficient machine Language Code Generation using the techniques of Optimization.

Course Outcomes:

After successful completion of this course, students should be able to:

Upon completion of the subject, student will be able to:

- Understand compiler and various phases in compilation.
- Understand the importance of code optimization
- Know about compiler generation tools and techniques
- Introduce different translation languages

Unit I: Introduction	Hours
Introduction of Compilers and Translators, Need of translators, Phases of a compiler, Lexical analysis, Syntax analysis, Semantic analysis, Intermediate code generation, Code Optimization, Code generation, Compiler construction tools, A simple one pass compiler	10
Unit II Programming languages	Hours
High - Level programming languages, Definitions of programming languages, The Lexical & syntactic structure of a language, Data elements,Data structures, Operators, Assignment, Statements	
Unit III: Lexical Analysis	10
Role of a Lexical analyzer, Simple approach to the design of Lexical Analysis, Regular Expression, finite automata, A language for specifying lexical analyzer	
Unit IV Syntax Analysis	Hours
Role of Parser, Context free Grammar, Capabilities of context-free grammars, Types of Parsing, Topdown Parsing, Bottom-Up parsing, Operator precedence parsing, Predictive parsers, LR Parser, automatic	10

construction of parser using YACC	
Unit V: Syntax Directed Translation and intermediate code generation	Hours
Syntax directed definitions, Implementation of Syntax directed translators, Intermediatecode, PostfixNotation, Parse trees and syntax trees	10
Unit V: Error detection, recovery and Introduction to Code Optimization	Hours
Errors, Lexical errors, Syntactic errors, Semantic errors, Sources of optimization, Loop optimization	10

References:

1. Compilers - Principles, Techniques and Tools -By A.V. Aho, R. Shethi and J.D. Ullman – (Pearson
Education)
2. Compiler Construction -By Dhamdere-(Mc-Millan)

B. Voc. in Programming Skills for Software Development

B. Voc. S. Y. (Semester IV)

BVOC.4.07: Lab 1: SQL Server

Learning Objectives:

Microsoft SQL Server course would enable the students in understanding Basics of SQL and Database

i. Learn how to design Database
ii. Learn fundamental concepts of Relational databases
iii. Learn fundamental concepts of DDL, DML and DCL
iv. Learn Different Math, Aggregate, Date and String functions
v. Creating and Using View
vi. Learn how to Create database Procedures

Course Outcomes:

After successful completion of this course, students should be able to:

1. Learn how to Design database
2. Learn to Build Relation among tables
3. Understanding Constraints
4. Understands Sub Queries
5. Creating Views
6. Create and use Procedures, Triggers and Cursor
7. Should able to take Backup and Restore of database.

1. Study of. NET Core and MFV 6
2. Study of Files and Folders in MVC Projects
3. Creating Controller and Actions
4. Creating Action Link and URL Routing
5. Creating ActionResult and ViewResult, Returning a view
6. Creating a Simple Razor View
7. Creating a Custom View and Partial View
8. Creating models using 'CodeFirst approach'
9. Creating Data base Application with DbContext and DbSet
10. Select, Insert Update,and Delete Operation using Entity Framework
11. Creating controllers and views using scaffold
12. Understanding Index, Details, Create, Edit, Delete action methods and views
13. Practical Based on Understanding HTMl Helper
14. Practical Based on Understanding Validations
15. Practical Based on Advanced Programming
16. Practical Based on Security
17. Practical Based on Deployment
18. Creating Simple Web Applications

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BVOC.4.07 Lab 2: ReactJS

Learning Objectives:

I. React JS course would enable the students in understanding Basics of front end design & write the simple web development using React JS programming.

II. Learn how to design forms, web applications.

III. Learn fundamental concepts of React JS such as. State, Props, Operators, conditional and looping statements, Arrays, Arrow functions etc.

Course Outcomes:

After successful completion of this course, students should be able to:

I. To design front end applications.

II. To write web application to solve the given problem

III. To use GraphQL, Webpack, and server-side rendering

IV. To design program using java script.

Lab Work/ Practical List

Programs for the demonstration of all the concepts in ReactJS.
Following List should be covered after the Programs for the demonstration of concepts of ReactJS.

1. Implement Basic JavaScript

2. Implement Table Tags

    i. Implement functions

3. Design a Form in ReactJS

    i. Validation of Form Using JavaScript

4. Implement Various Types of Styling

5. Display Various Forms of ReactJS Document

6. Using different Hooks

7. Building Menues using JSX

8. Learn how to use React Router.

9. Learn how to test React applications.

10. Learn an application framework built on top of React,

like Gatsby or Next.js.

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B. Voc. S. Y. (Semester IV)

Lab.4.08 Lab2: Bootstrap and JQuery

Learning Objectives:

i Bootstrap and JQuery course would enable the students in understanding Basics of front end design & write the simple web development using React JS programming.

ii Learn how to design forms, web applications.

iii Learn fundamental concepts of Bootstrap and JQuery such as.

Course Outcomes:

After successful completion of this course, students should be able to:

i To design front end applications.

ii To write web application to solve the given problem

iii To use Bootstrap and JQuery and server-side rendering

iv To design program using Bootstrap and JQuery.

Lab Work/ Practical List

Programs for the demonstration of all the concepts in Bootstrap and JQuery.
Following List should be covered after the Programs for the demonstration of concepts of Bootstrap and JQuery.

1. What is Bootstrap Grid
2. How to apply Bootstrap Grid
3. What is Container
4. What is Offset Column
5. How to Reordering Columns
6. How to Display responsive Images
7. How to change class properties
8. How to use readymade themes
9. How to customize Bootstrap's components, Less variables, and jQuery plug-in.
10. What is Bootstrap Typography
11. How to use Typography
12. What is Bootstrap Tables
13. What is Bootstrap Form Layout
14. What is Bootstrap Button

15. How display images in different styles like Circle shape etc
16. How to display text like muted and warning etc
17. What is Carets Classes

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B. Voc. S. Y. (Semester IV)

BVOC.4.09 Lab 3: Advanced Java

Learning Objectives:

i. To Design and build robust and maintainable web applications
ii. To Create dynamic HTML content with Servlets and JavaServer Pages, using the JSP Standard Tag Library (JSTL)
iii. To Make Servlets and JSP work together cleanly
iv. To Access databases with Hibernate

Course Outcomes:

After successful completion of this course, students should be able to:

i. Create dynamic and interactive web sites and interaction with client and server.
ii. Do server side programming with java Servlets and JSP
iii. Implement the web based applications using Hibernate

Lab Work/ Practical List

Programs for the demonstration of all the concepts in Servlet JSP and Spring MVC.

1. Write a java program to represent ArrayList class.
2. Write a program to demonstrate TreeSet.
3. Write a program to store user id and password using HashMap.
4. Write a java program that connects to a database using JDBC and does add, deletes, modify and retrieve operations using Statement.
5. Write a java program that connects to a database using JDBC and does add, deletes, modify and retrieve operations using PreparedStatement.
6. Write a java program that connects to a database using JDBC and does add, deletes, modify and retrieve operations using CallableStatement.
7. Write a JDBC application which will interact with Database and perform the following task. 1) Create a store procedure which will insert one record into employee table. 2) Create a store procedure which will retrieve salary for given employee id. 3) Write a java application which will call the above procedure and display appropriate information on screen.
8. Write a java program that prints the meta-data of a given table.
9. Write down the program for testing the forward action for servlet collaboration.
10. Develop Real Time Login Application using Servlet and JDBC.

11. Create Servlet file which contains following functions: 1. Connect 2. Create Database 3. Create Tabe 4. Insert Records into respective table 5. Update records of particular table of database 6. Delete Records from table.
12. Write down the program in which input the two numbers in an html file and then display the addition in JSP file.
13. Write down the Program for testing the include action tag in jsp
14. Develop Student Registration Application using Servlet, JSP and JDBC.
15. Develop Custom CRUD Application using Servlet, JSP and JDBC.
16. Develop Login Application using Servlet, JSP and Hibernate

References:

1 Java The Complete Reference 9th Edition, Herbert Schildt, McGraw Hill Education
2 (India) Private Limited, New Delhi.
3 Java Servlet & JSP Cookbook, Bruce W. Perry, O'Reilly Publication.
4 Beginning Hibernate: For Hibernate 5, Fourth Edition, Joseph B. Ottinger Jeff Linwood Dave Minter, APress Publication

College of Computer Science and Information Technology, Latur
Department of Computer Science
Program Structure for
B. Voc. in Programming Skills for Software Development
B. Voc. T. Y. (Semester V + Semester VI)

Class	Course Code		Course Title	Lect. per week	No. of Credits	Marks ESC	Marks CE	Total Marks
SEMESTER – V								
.Voc T. Y. B	General Education	BVOC.5.01	Environmental Studies	4	4	75	25	100
		BVOC.5.02	Mongo DB	4	4	75	25	100
		BVOC.5.03	Software Testing with Selenium	4	4	75	25	100
	Component Skill	BVOC.5.04	ASP.Net MVC Core	4	4	75	25	100
		BVOC.5.05	Spring MVC	4	4	75	25	100
		BVOC.5.06	Minor Project & Seminar	4	4	75	25	100
		BVOC.5.07	Lab 1: Mongo DB + Testing	2	2	30	20	50
		BVOC.5.08	Lab 2: ASP.Net MVC Core	2	2	30	20	50
		BVOC.5.09	Lab 3: Spring MVC	2	2	30	20	50
				30				**750**
SEMESTER – VI								
T. Y. B. Voc.	General Education	BVOC.6.01	ASP.NET Web API	4	4	75	25	100
		BVOC.6.02	Cloud Computing	4	4	75	25	100
		BVOC.6.03	Spring Boot	4	4	75	25	100
	Skill Component	BVOC.6.04	Internet of Things(IOT)	4	4	75	25	100
		BVOC.6.05	Major Project	4	4	75	25	100
		BVOC.6.06	DevOps Fundamental	4	4	75	25	100
		BVOC.6.07	Lab 1: ASP.NET Web API	2	2	30	20	50
		BVOC.6.08	Lab 2: Spring Boot	2	2	30	20	50
		BVOC.6.09	Lab 3: Cloud Computing	2	2	30	20	50
				30				**750**

B. Voc. in Programming Skills for Software Development

B. Voc. T. Y. (Semester V)

BVOC.5.01 Environmental Studies

Learning Objectives:

i. Developing public understanding of environmental issues.

ii. Prescribing basic information about the environment and its associated issues.

iii. Concern for the environment must be fostered through education.

iv. Developing public enthusiasm for environmental protection and improvement

Course Outcomes:

The Environmental Studies minor supplements other majors to facilitate students' understanding of complex environmental issues from a problem-oriented, interdisciplinary perspective

After successful completion of this course, students should be able to:

i. Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.

ii. Appreciate concepts and methods from ecological and physical sciences and their application in environmental problem solving.

iii. Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.

Unit 1. The Multidisciplinary Nature of Environmental Studies Definition, Scope And	**Hour**
Importance. Need for public awareness.	10
Unit 2. : Natural Resources	**Hour**
Introduction Renewable and non-renewable resources Role of an individual in conservation of natural resources Equitable use of resources for sustainable lifestyles	10
Unit 3: Ecosystems	**Hour**

Concept of an ecosystem Structure and Functions of an ecosystem Producers, consumers and decomposers Energy flow in the ecosystem Ecological succession Food chains, food webs and ecological pyramids Introduction, types, characteristic features, structure and functions	10
Unit 4: Biodiversity and its Conservation	**Hour**
Introduction Biogeographic classification of India Value of biodiversity Biodiversity at global, national and local levels India as a mega-diversity nation Hotspots of biodiversity Treats to biodiversity: Habitat loss, poaching of Wildlife, man-wildlife conflicts Endangered and endemic species of India. Conservation of biodiversity: Insitu and Exsitu	10
Unit 5: Pollution	**Hour**
Definition Causes, effects and control measures of pollution Solid waste management: cause, effects and control Measures of urban and industrial Waste Role of an individual in the prevention of pollution Pollution case studies Disaster management: Floods, Earthquakes, Cyclones, Landslides	10
Unit 6: Social Issues and the Environment	**Hour**
From unsustainable to sustainable development Urban problems related to energy Water conservation, rainwater harvesting, and watershed management Resettlement and rehabilitation of people: Its problems and concerns Environmental ethics: Issues and possible solutions.Climate change, global warming, acid rain, ozone layer Depletion, nuclear accidents and holocaust Wasteland reclamation Consumerism and west products The environment (protection) Act The (prevention and control of pollution) Act The water (Prevention and control of pollution) Act The Wildlife protection Act	10

Reference books:

Environmental studies –	Dr. vitthalGharpure
Environmental Pollution	By T. Katyal, M. Satake
Environmental science	By Khan M.R.
Ecology of environment	By P.P.Sharma
Environmental Biology	By R.S. Clerk
Environmental health	By A.J Rowland

B. Voc. in Programming Skills for Software Development

B. Voc. T. Y. (Semester V)

BVOC.5.02 MongoDB

Learning Objectives:

i. MongoDB course would enable the students in understanding Basics of NoSQL Databases to design the queries.
ii. Learn how to design Queries.
iii. Learn fundamental concepts of Mongo DB such as. secondary indexes, range queries, sorting, aggregations, and geospatial indexes etc.

Course Outcomes:

After successful completion of this course, students should be able to:

i. To covers aspects on Big Data, NOSQL and details on architecture and development on MongoDB.
ii. To write Database application to solve the given problem
iii. To use sorting, aggregations, geospatial indexes and server-side rendering.
iv. To design program using MongoDB.

Unit I: Introduction to MongoDB	Hours
Ease of Use , Easy Scaling , Tons of Features…	10
Unit II: Getting Started	Hours
Documents Collections Dynamic Schemas Naming Databases Getting and Starting MongoDB Introduction to the MongoDB Shell Running the Shell A MongoDB Client Basic Operations with the Shell Data Types Basic Data Types Dates Arrays Embedded Documents _id and ObjectIds	
Unit III: Creating, Updating, and Deleting Documents	10

Inserting and Saving Documents Batch Insert Insert Validation Removing Documents Remove Speed Updating Documents Document Replacement Using Modifiers Upserts Updating Multiple Documents Returning Updated Documents	
Unit IV : Querying	Hours
Introduction to find Specifying Which Keys to Return Limitations Query Criteria Query Conditionals OR Queries $not Conditional Semantics Type-Specific Queries null Regular Expressions Querying Arrays Querying on Embedded Documents $where Queries Server-Side Scripting Cursors Limits, Skips, and Sorts Avoiding Large Skips Advanced Query Options	10
Unit V: Indexing	Hours
Introduction to Indexing Introduction to Compound Indexes Using Compound Indexes How $-Operators Use Indexes Indexing Objects and Arrays Index Cardinality Using explain() and hint() The Query Optimizer When Not to Index Types of Indexes Unique Indexes	10

Sparse Indexes Index Administration Identifying Indexes Changing Indexes	
Unit VI: Aggregation	Hours
The Aggregation Framework Pipeline Operations $match $project $group $unwind $sort $limit $skip Using Pipelines MapReduce Example 1: Finding All Keys in a Collection Example 2: Categorizing Web Pages MongoDB and MapReduce Aggregation Commands count distinct group	10

References:

1. MongoDB: The Definitive Guide, Second Edition
by Kristina Chodorow, Published by O'Reilly Media, Inc., isbn=9781449344689.

2. Practical MongoDB: Architecting, Developing, and Administering MongoDB
Shakuntala Gupta Edward NavinSabharwal, ISBN-13 (pbk): 978-1-4842-0648-5, Published by APRESS, First Edition.

B. Voc. in Programming Skills for Software Development

B. Voc. T. Y. (Semester V)

BVOC.5.03 Software Testing with Selenium

Learning Objectives:

1. The student should be made to expose the criteria for test cases.
2. Learn the design of test cases and be familiar with test management and test automation techniques.

Course Outcomes:

1. At the end of the course the students will be able to Design test cases suitable for a software development for different domains.
2. Identify suitable tests to be carried out and prepare test planning based on the document.
3. Document test plans and test cases designed and Use of automatic testing tools.

Unit	Hours
Unit-I Test Automation and STLC What is Automation testing Software test automation Advantages of Automation testing skill needed for automation scope of automation design and architecture for automation requirements for a test tool challenges in automation STLC Phases Types of Testing Methods of Testing Static and Dynamic Testing	**12**
Unit-II Test Management Test Plan Template Usecase Testing Scenario Testing Testcases& Test Data Testcases Template Test Design Technique	**8**
Unit-III Defect Management What is Defect/Bug? Reason for Defects in Software Defect Tracking System Defect Life Cycle Attributes of Defect	**7**
Unit-IV Introduction to Selenium History of Selenium Why Selenium tool Differences between Selenium and other Tools Different components in Selenium Installation and Introduction to IDE Creating first script	**8**

Unit-V Selenium WebDriver Web Elements/HTML Elements Inspecting Web Elements (Using a Browser) Element Locators – To locate/recognize/identify elements in web pages (Using HTML Locators) Performing actions on elements (Using WebDriver Commands/Methods) Page Object Model (Creating Object Repositories) Waits Writing Test Cases	**15**
Unit-VI TestNG Framework for Selenium Create Test batches Prioritize Test cases Execute Test Batches Inserting Verification Points & Generate test Reports	**5**

References:
1. Software Testing Concepts and Tools, Nageswara Rao Dreamtech Publication ISBN 8177227122, 9788177227123
2. Software Testing by Ron Patton, Second Edition, BPB Publication, ISBN-9780672327988
3. Selenium WebDriver Recipes in Java by Zhimin Zhan.

B. Voc. in Programming Skills for Software Development

B. Voc. T. Y. (Semester V)
BVOC.5.04 ASP.Net MVC Core

Learning Objectives:

Microsoft .NET Core and ASP.NET MVC 6 course would enable the students in understanding Basics of .NET Core and Designing Web Application with ASP.NET MVC 6

i Learn how to design Dynamic Web Application

ii Learn fundamental concepts of Model View and Controller, Creating Controller, Creating and generating Different Views.

iii Creating and Using Razor View and Partial View.

iv Learn how Create database Application with Entity Framework

v Learn the use of Scaffolding.

vi Learn HTML Helper and Validations

Course Outcomes:

After successful completion of this course, students should be able to:

i. Learn how to build a simple MVC application using .NET 6
ii. Learn to build Database web applications using Entity Framework.
iii. Configure database connectivity for Entity Framework
iv. Understand and use Validations
v. Learn how to Design the Single Page Web Application

Unit I: Introduction to .NET Core and MVC 6	Hours
Introduction to .NET Core 6.0 Introduction to MVC 6 NET Web Forms (vs) ASP.NET MVC Advantages and disadvantages of each List of Versions of ASP.NET MVC Differences between versions of ASP.NET MVC MVC Architecture Controller and action method, View, and Model Request Flow in ASP.NET MVC Overview of Folders and files of MVC project	10
Unit II: Controllers	Hours
Introduction to Controllers Creating Controllers and Actions Calling action methods thru the browser Returning from action methods Parameters in Action methods ActionLink URL Routing The need of URL Routing Parameters in URL Default Parameter Values Parameters with Constraints Literals in URL	10
Unit III: Views, and Model	10

Introduction to Views (Razor) ActionResult and ViewResult, Returning a view Creating a Simple Razor View Intermingling Code and Markup in Razor Views View Bag / View Data / Temp Data Shared Views, ASPX View Engine (vs) Razor Introduction to LayoutViews The need of layout views, cshtml Creating custom layout views Layout Views with Sections Partial Views RenderPartial() Introduction to Models Need of models Creating models using 'CodeFirst approach'	
UNIT IV Entity Framework in MVC and Scaffold Templates in MVC	Hours
Introduction to Entity Framework Need of Entity Framework Creating DbContext and DbSet Configuring connection string Introduction to scaffold Templates in MVC Need of Scaffolding Creating controllers and views using scaffold Strongly typed views Understanding Index, Details, Create, Edit, Delete action methods and views	10
Unit V: HTML Helpers, Action Filters, and Validations	Hours
Introduction to HTML helpers DisplayNameFor( ), DisplayFor( ) BeginForm( ), LabelFor() EditorFor( ), ValidationMessageFor( ) RadioButtonFor( ), DropDownListFor( ) ListBoxFor( ), CheckBoxFor( ) AntiForgeryToken() Introduction to action filters Introduction to Validations Model level validations (vs) View level validations Importing jQuery Validation Plug in [Required], [RegularExpression]. [Range] [StringLength], [Compare], [Remote], IsValid	10
Unit VI: Advanced Programming, Security and Deployment	Hours

ASP.NET Core Pipeline ASP.NET Core Filters Creating Custom Filters Dependency Injection (DI) Implementing DI in ASP.NET Core Built-In Container Service ASP.NET Core Environments Exceptions Handling and Logging Authentication and Authorization Deploying Web Application Deployment (docker, azure, aws) Running in Production Build Web Application	10

References:

1. Pro ASP.NET Core 6: Develop Cloud-Ready Web Applications Using MVC, Blazor, and Razor Pages 9th ed. Edition -Adam Freeman
2. High Performance Enterprise Apps using C# 10 and .NET 6 Ockert J. du Preez
3. Programming ASP.NET Core Paperback – 1 January 2019 by Dino Esposito (Author)

B. Voc. in Software Development
B. Voc. T. Y. (Semester V)
BVOC.5.05 Spring MVC

Learning Objectives:

i. To Acquire knowledge on creation of software components using Spring Framework.
ii. To Learn safe and maintainable techniques for programming with AOP.
iii. To Understand REST, and use Spring MVC to build RESTful services.
iv. To learn the creation of pure Dynamic Web Application using Spring MVC.

Course Outcomes:

After successful completion of this course, students should be able to:

i. Implement web based applications using features of Spring Framework.
ii. Apply the concepts of server side technologies for dynamic web applications using Spring MVC.
iii. Use the core principles of Spring, and of Dependency Injection (DI) / Inversion of Control.
iv. Integrate Spring MVC with technologies such as Hibernate.

Unit I: Introduction to Spring	Hours
Overview of Spring Technology, Spring Introduction, Spring Framework Features, The Spring Container, Inversion of Control, Dependencies and Dependency Injection	10
Unit II: Configuration, Beans Scope and Auto Wiring	12
Annotation Driven Configuration, Java Based Configuration, Bean Scope and Lifecycle, Value Injection, Constructor Injection, Qualifiers / Domain Specific Language (DSL)	
Unit III Introduction to Spring MVC	8
The Benefits of Spring MVC, Dispatcher servlet, The Controller Interface, Web application context, The web application architecture, Creating first Spring MVC project	
Unit IV Annotation-Based Controllers	Hours
Spring MVC Annotation Types, Writing Request-Handling Methods, Using An Annotation-Based Controller, Dependency Injection with @Autowired and @Service, Request Parameters and Path Variables	8
Unit V: Spring Tag Libraries and View Resolver	Hours
Serving and processing forms, Customizing data binding, Externalizing text messages, RedirectView, Flash attribute, Using ContentNegotiatingViewResolver, Working with HandlerExceptionResolver, Using JDBC with Spring MVC, Integrating Hibernate in Spring MVC	10

Unit VI Interceptor, Validator and REST	Hours
Working with interceptors, LocaleChangeInterceptor, Mapped interceptors, Bean Validation, Custom validation with JSR-303, Spring validation, Introduction to REST, Handling web services in Ajax	12

References:

1. Spring Framework Cookbook, Java Code Geeks.
2. Introducing Spring Framework, Felipe Gutierrez, APress Publication
3. Spring MVC: A Tutorial, Second Edition, Paul Deck, Brainy Software.
4. Spring MVC Beginner's Guide, Second Edition, AmuthanGaneshan, Packt Publishing Ltd

B. Voc. T. Y. (Semester V)
BVOC.5.06 Minor Project

Students have to develop minor projects. Projects topics will be provided to them as per the topic and guide allotted to them they have to develop the project.

B. Voc. in Programming Skills for Software Development

B. Voc. T. Y. (Semester V)

BVOC.5.07 Lab 1: MongoDB

Learning Objectives:

i. MongoDB course would enable the students in understanding Basics of NoSQL Databases to design the queries.
ii. Learn how to design Queries.
iii. Learn fundamental concepts of MongoDB such as. Secondary indexes, range queries, sorting, aggregations, and geospatial indexes etc.

Course Outcomes:

After successful completion of this course, students should be able to:

i. To covers aspects on Big Data, NOSQL and details on architecture and development on MongoDB.
ii. To write Database application to solve the given problem
iii. To use sorting, aggregations, geospatial indexes and server-side rendering.
iv. To design program using MongoDB.

Lab Work/ Practical List

Programs for the demonstration of all the concepts in MongoDB.

Following List should be covered after the Programs for the demonstration of concepts of MongoDB.

1) What is NoSQL? Types of NoSQL Commands

2) Study of Datatypes in MongoDB

3) Creating Tables &Retrieving , Manipulating Data from tables

4) Study of Altering Tables IN MongoDB

5) Study of Data Constraints in MongoDB

6) Study of Operators

7) Study of NoSQL Functions

8) Study of Views in MongoDB

9) Study of Joining Tables in MongoDB

10) Study of Subqueries in MongoDB

11) Study of in PL/SQL Blocks in MongoDB

12) Study of in Triggers in MongoDB

13) Study of in Cursors in MongoDB

B. Voc. in Programming Skills for Software Development

B. Voc. T. Y. (Semester V)

BVOC.5.07 Lab 1: Software Testing

After successful completion of this course, students should be able to:

i. To perform automation testing.
ii. To write software program to handle web browsers
iii. To find the element on web forms.

Sr.No	Practical Title
1.	Setting The Executable Path Of The Selenium Webdriver.
2.	Capture Screenshot Of Test Automation
3.	Refreshing WebPage While Automation Testing
4.	Open A Webpage In A New Tab
5.	Saving Partial Screenshot Of A Web page
6.	Execute JavaScript Code In Selenium Webdriver
7.	Extracting Results Of JavaScript Code
8.	Locating Elements On A Web Page Using CSS Locators
9.	HTML Source Of WebElement In Selenium Webdriver
10.	Handling Operations With Check Boxes
11.	Selecting Element via CSS Selector In Selenium Webdriver
12.	Explicit Wait For Handling Different Scenarios In Selenium Webdriver
13.	Scroll Operations In A Web Page
14.	Find Size Of An Element In A Web Page

References:

1. Software Testing Concepts and Tools, Nageswara Rao Dreamtech Publication ISBN 8177227122, 9788177227123
2. Software Testing by Ron Patton, Second Edition, BPB Publication, ISBN-9780672327988
3. Selenium WebDriver Recipes in Java by Zhimin Zhan.

B. Voc. T. Y. (Semester V)

BVOC.5.08: Lab 2: .NET Core and ASP.NET MVC 6

Learning Objectives:

Microsoft .NET Core and ASP.NET MVC 6 course would enable the students in understanding Basics of .NET Core and Designing Web Application with ASP.NET MVC 6

i. Learn how to design Dynamic Web Application
ii. Learn fundamental concepts of Model View and Controller, Creating Controller, Creating and generating Different Views.
iii. Creating and Using Razor View and Partial View.
iv. Learn how Create database Application with Entity Framework
v. Learn the use of Scaffolding.
vi. Learn HTML Helper and Validations

Course Outcomes:

After successful completion of this course, students should be able to:

i. Learn how to build a simple MVC application using .NET 6
ii. Learn to build Database web applications using Entity Framework.
iii. Configure database connectivity for Entity Framework
iv. Understand and use Validations

1. Study of. NET Core and MFV 6
2. Study of Files and Folders in MVC Projects
3. Creating Controller and Actions
4. Creating Action Link and URL Routing
5. Creating ActionResult and ViewResult, Returning a view
6. Creating a Simple Razor View
7. Creating a Custom View and Partial View
8. Creating models using ‘CodeFirst approach’
9. Creating Data base Application with DbContext and DbSet
10. Select, Insert Update,and Delete Operation using Entity Framework
11. Creating controllers and views using scaffold
12. Understanding Index, Details, Create, Edit, Delete action methods and views
13. Practical Based on Understanding HTMl Helper
14. Practical Based on Understanding Validations
15. Practical Based on Advanced Programming
16. Practical Based on Security
17. Practical Based on Deployment
18. Creating Simple Web Applications

B. Voc. T. Y. (Semester V)
BVOC.5.09 Lab 3: Spring MVC

Learning Objectives:

i. To Acquire knowledge on creation of software components using Spring Framework.
ii. To Learn safe and maintainable techniques for programming with AOP.
iii. To Understand REST, and use Spring MVC to build RESTful services.
iv. To learn the creation of pure Dynamic Web Application using Spring MVC.

Course Outcomes:

After successful completion of this course, students should be able to:

i. Implement web based applications using features of Spring Framework.
ii. Apply the concepts of server side technologies for dynamic web applications using Spring MVC.
iii. Use the core principles of Spring, and of Dependency Injection (DI) / Inversion of Control.
iv. Integrate Spring MVC with technologies such as Hibernate.

Lab Work/ Practical List

Programs for the demonstration of all the concepts in Servlet JSP and Spring MVC.

1. Write a program to implement inversion of control.
2. Write a program to demonstrate dependency injection.
3. Write a program for the demonstration of auto wiring.
4. Write a program to demonstrate Spring Tag Libraries.
5. Write a program to demonstrate View Resolver.
6. Develop Custom CRUD Application using Spring MVC and JDBC.
7. Develop Login Application using Spring MVC and Hibernate.
8. Write a program for CURD operations using Spring MVC and Hibernate.
9. Develop Spring MVC Application for following operations.
   -Customer Login
   -Add Customer
   -Edit Customer Information
   -Delete Customer
   -View Customer List
10. Write a program for the demonstration of Interceptors.
11. Write a program for the demonstration of Spring MVC Validator.
12. Write a program for the demonstration of Spring MVC Restful Web Services.

References:

1. Spring Framework Cookbook, Java Code Geeks.

2. Introducing Spring Framework, Felipe Gutierrez, APress Publication
3. Spring MVC: A Tutorial, Second Edition, Paul Deck, Brainy Software.
4. Spring MVC Beginner's Guide, Second Edition, AmuthanGaneshan, Packt Publishing Ltd

Semester VI

B. Voc. in Programming Skills for Software Development

B. Voc. T. Y. (Semester VI)

BVOC.6.01 ASP.NET Web API

Learning Objectives:

ASP.NET Web API course would enable the students in understanding Basics of Web Development with Web API

i. Learn how to design and use Micro-services and Service Oriented Architecture.
ii. Learn fundamental concepts of REST and HTTP
iii. Learn fundamentals of ASP.NET Core Web API
iv. Learn MVC and Routing
v. Creating and Using API with HTML and JQuery Ajax
vi. Learn how to provide web Security

Course Outcomes:

After successful completion of this course, students should be able to:

i. Understands how Service Oriented Architecture Works
ii. Learn to Create REST API
iii. Understands MVC and Routing
iv. Understands Creating and Using API with HTML and JQuery Ajax
v. Understands How to Implements Web Security

Unit I: Introduction to Micro services and Service Oriented Architecture Web API	Hours
Services in SOA Monolithic Architecture Introduction to Micro-services Benefits of Micro-services	10
Unit II Understanding HTTP and REST	Hours
Software Architecture REST Principles REST Architectural Elements HTTP Version 2 of HTTP Binary Messages Richardson Maturity Model	10
Unit III Anatomy of ASP.NET Core Web API	10
A Quick Recap of the MVC Core Web API Inception of Web APIs and Their Evolution Introduction to .NET Core Introducing ASP.NET Core Crating ASP.NET Core API Projects Using Studio IDE Creating ASP.NET Core Web Application on Linux	

Creating ASP.NET Core Web Application with Yeoman ASP.NET Core Request Processing Running the ASP.NET Core Web API Projects	
UNIT IV Controller Action and Models and Implementing Routing	Hours
Introduction to Controller Actions-POST, GET, PUT, Patch, Delete Controllers Models GET by ID Introducing Routing ASP.NET Core Web API and Routing Convention Based Routing Attribute Based Routing Multiple Routes Routing Constraints Link Generation	10
Unit V: Consuming the API with HTML and JQuery Ajax	Hours
Getting the Resources, Adding New Resources, Updating Resources, Deleting Resources	10
Unit VI: Web API Security	Hours
Understanding Threat Model and OWASP Apply SSL CORS Implementing JWT Authentication Claims Based Authorization Identity Management in Web API	10

References:

1 Mastering ASP.NET Web API, By MithunPattankar, MalendraHurbuns · 2017
2 Pro ASP.NET Core 6: Develop Cloud-Ready Web Applications Using MVC, Blazor, and Razor Pages 9th ed. Edition -Adam Freeman
3 High Performance Enterprise Apps using C# 10 and .NET 6 Ockert J. du Preez
4 Programming ASP.NET Core Paperback – 1 January 2019 by Dino Esposito (Author)

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B. Voc. T. Y. (Semester VI)

BVOC.6.02 Cloud Computing

Learning Objectives:

i. To provide students with the fundamentals and essentials of Cloud Computing.
ii. To provide students a sound foundation of the Cloud Computing so that they are able to start using and adopting Cloud Computing services and tools in their real life scenarios.
iii. To enable students exploring some important cloud computing driven commercial systems and applications.
iv. To expose the students to frontier areas of Cloud Computing and information systems, while providing sufficient foundations to enable further study and research.

Course Outcomes:

After successful completion of this course, students should be able to:

i. Explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.
ii. Apply the fundamental concepts in datacenters.
iii. Identify resource management fundamentals and outline their role in managing infrastructure in cloud computing.
iv. Analyze various cloud programming models and apply them to solve problems on the cloud.

Unit I: Introduction to Cloud Computing	Hours
Cloud Computing – Overview, cloud computing architecture, Cloud Computing: Architecture – Deployment Models, Cloud Computing: Virtualization,	10
Unit II Service and Data Management in Cloud Computing	10
Service Level Agreement, Cloud Economics, Managing Data, Introduction to Map Reduce, Open Stack	
Unit III: Resource Management and Cloud Security	12
Resources in Cloud Computing, Resource management in Cloud, Resource Management for IaaS, Resource Management – Objectives, Challenges, Cloud Computing: Security, Security Issues In Collaborative SaaS Cloud, Broker for Cloud Marketplace	
Unit IV Open Source and Commercial Clouds	Hours
Mobile Cloud Computing – Introduction, Need of Mobile Cloud Computing, Key-features of Mobile Cloud Computing, Typical MCC Workflow, Mobile Cloud Computing –Typical Architecture	10
Unit V: Research trend in Cloud Computing	Hours
Docker, Docker features, Docker components and architecture, Green cloud, Cloud computing advantages and challenges, Data center (DC) architectures, Sensor Networks and its challenges, Sensor Cloud Computing, Sensor cloud framework, Basic IoT architecture, IoT cloud,	10

Cloud components for IoT	
Unit VI: Cloud–Fog Computing	Hours
Cloud-Fog Paradigm – Overview, Cloud-Fog-Edge/IoT,, Cloud-Fog Paradigm – Resource Management Issues, VM Migration – Basics, Migration strategies, Dew Computing, Serverless Computing, Sustainable Computing	8

References:

1. Enterprise Cloud Computing: Technology, Architecture, Application, Gautam Shroff, Cambridge University Press
2. Cloud Security, Ronald L. Krutz and Russell Dean Vines, Wiley Publishing, Inc.
3. Beginning Serverless Computing, Maddie Stigler, APress Publication
4. Zen of Cloud, HaishiBai, CRC Press

B. Voc. in Programming Skills for Software Development

B. Voc. T. Y. (Semester VI)

BVOC.6.03 Spring Boot

Learning Objectives:

i. To understand how to build complex UIs using Spring Boot.
ii. To understand and use Spring Boot's auto-configuration.
iii. To Make Spring Boot and JDBC work together cleanly.
iv. To Acquire knowledge on creation of software components using Spring Boot and REST API.
v. To be familiar with using Spring Boot starters and start.spring.io to easily create new applications.
vi. To be familiar with Spring Boot's Devtools.

Course Outcomes:

After successful completion of this course, students should be able to:

i. Learn how to build a simple MVC application using Spring Boot
ii. Learn to build RESTful web applications using Spring Boot.
iii. Configure database connectivity via Spring Boot
iv. Understand and use Spring Boot's Actuator
v. Use Actuator endpoints to monitor and manage applications

Unit I: Introduction to Spring Boot	Hours
Overview of the Spring Framework, Spring Configuration Styles, Getting Started with Spring Boot, Spring Boot CLI, First Spring Boot Application	10
Unit II Spring Boot Internals and Features	12
Auto-configuration, Using @Conditional, Externalizing Configuration Properties, Developer Tools, Spring Boot Features	
Unit III: Web Applications with Spring Boot	8
Developing Web Application Using Spring Boot, Using the Tomcat, Jetty, and Undertow Embedded Servlet Containers, Customizing Embedded Servlet Containers, Customizing Spring MVC Configuration, Registering Servlets, Filters, and Listeners as Spring Beans, View Templates that Spring Boot Supports	
Unit IV Data Access with Spring Boot	Hours
Spring JDBC, Spring Data JPA, Spring Data REST, Spring Data MongoDB	10
Unit V: Testing Spring Boot Applications	Hours
Spring Testing Framework, Testing with Mock Implementations, Testing Slices of Application Using @*Test Annotations	10
Unit VI: Spring Boot Actuator	Hours
Introducing the Spring Boot Actuator, Exploring Actuator's Endpoints,	10

Customizing Actuator Endpoints, Securing Actuator Endpoints, Implementing Custom Health Indicators, Capturing Custom Application Metrics	

References:

1. Beginning Spring Boot 2, K. Siva Prasad Reddy, APress Publication
2. Pro Spring Boot 2, Felipe Gutierrez, APress Publication
3. Spring Boot in Action, Craig Walls, Manning Publications
4. Mastering Spring 5.0, Ranga Rao Karanam, Packt Publishing Ltd

Learning Objectives:

I. To study the fundamentals about IoT
II. To study about IoT Access technologies
III. To study the design methodology and different IoT hardware platforms.
IV. To study the basics of IoT supporting services.
V. To study about various IoT case studies and industrial applications.

Course Outcomes:

After successful completion of this course, students should be able to:

- Understand the basics of IoT.
- Implement the state of the Architecture of an IoT.
- Understand design methodology and hardware platforms involved in IoT.
- Understand how to analyse and organize the data.
- Compare IOT Applications in Industrial & real-world.

Unit I: Basics of IoT Networking	Hours
Overview of Internet of Things Wireless Sensor Networks Machine-to-Machine Communications Cyber Physical Systems	5
Unit II: Introduction to Internet of Things	Hours
Evolution of IoT Enabling IoT and the Complex Interdependence of Technologies IoT Networking Components Addressing Strategies in IoT	5
Unit III: IoT Sensors, Actuators and Microcontroller devices	Hours
Sensors Sensor Characteristics Sensing Types. Actuators Actuator Characteristics Actuator Types. Arduino Raspberry Pi	10
Unit IV: Processing in IoT	Hours

Data Format Importance of Processing in IoT Processing Topologies IoT Device Design and Selection Considerations	10
Unit V: IoT Connectivity Technologies	Hours
IEEE 802.15.4, Zigbee, RFID, DASH7, NFC, Z-Wave Cloud Computing Virtualization Cloud Models Sensor-Cloud: Sensors-as-a-Service Fog Computing and Its Applications	10
Unit VI: Application Areas and Futures of IoT	Hours
Agricultural IoT Components of an agricultural IoT Advantages of IoT in agriculture Smart irrigation management system Vehicular IoT Components of vehicular IoT Advantages of vehicular IoT Healthcare IoT Components of healthcare IoT Advantages and risk of healthcare IoT Evolution of New IoT Paradigms Challenges Associated with IoT Emerging Pillars of IoT	10

References:

1. Introduction to IoT by SudipMisra, Anandarup Mukherjee, Arijit Roy | Publication Cambridge University Press | ISBN 9781108842952, ISBN 9781108959742.

2. The Internet of things_ do-it-yourself projects with Arduino, Raspberry Pi, and BeagleBone Black | ISBN: 978-0-07-183521-3

3. The Internet of Things – Key applications and Protocols, Olivier Hersent, David Boswarthick, Omar Elloumi and Wiley, 2012.| ISBN 978-1-11999435-0

B. Voc. in Programming Skills for Software Development

B. Voc. T. Y. (Semester VI)

B.Voc.6.06DevOps Fundamental

Learning Objectives:

1. DevOps Fundamental course would enable the students in understanding Basics of DevOps, Its Life Cycle, Integration and Deployments.
2. To Introduces Cloud Infrastructure with Terraform and Deployment with Packer
3. Understanding DevOps CI/DI PilelineVersion Control with Git, Git, Jenkins & Maven Integration
4. To Introduce the process of Continuous Integration and Continuous Delivery
5. To Introduces the tools Docker and Kubernetes
6. Understands the tools for testing applications

Course Outcomes:

After successful completion of this course, students should be able to:

1. Understands the basics of DevOps and its Operations
2. Learns Terraform and Deployment with Packer
3. Understands the different Tools: Git, Jenkins &Mave
4. Learns NuGet,Docker and Kubernetes
5. Understands the use of Postmans

Unit I: Introduction to Devops	Hours
What Is Devops Benefits of working in a DevOps environment History of Devops DevOps Main Objectives DevOps and Software Development Life Cycle: Waterfall Model, Agile Model DevOps Stages Continuous Integration & Deployment: Jenkins Containers and Virtual Development: Docker, Vagrant Configuration Management Tools: Ansible, Puppet, Chef DevOps Delivery Pipeline Understanding IAC Practices	10
Unit II: Provisioning Cloud Infrastructure with Terraform and Deployment with Packer	Hours
Technical Requirements Installing Terraform Configuring Terraform for Azure Writing a Terraform scripts to deploy Azure Infrastructure Deploying the Insfracture with Terraform Terraform Command Line and Life Cycle Overview of Packer Creating packer Template for Azure VMs with Scripts Executing Packer	10
Unit III: DevOps CI/DI PilelineVersion Control with Git, Git, Jenkins &	10

Maven Integration	
Version Control Preview Git Introduction Preview Git Installation Commonly used commands in Git Working with Remote repository Branching and merging in Git Preview Merge Conflicts Stashing, Rebasing, Reverting and Resetting Git Workflows	
UNIT IV Continuous Integration and Continuous Delivery	Hours
CI/CD Principles Using Package Manger- NuGet and npm Introduction to Maven Maven Architecture Introduction to Continuous Integration Introduction to Jenkin Jenkins Architecture Plugin Management in Jenkins Preview Jenkins Security Management Notification in Jenkins Jenkins Master-slave architecture Jenkins Delivery Pipeline Jenkins Declarative pipeline Using Azure Pipelines	10
Unit V: Containerized Application With Docker and Kubernetes	Hours
Installing Docker Creating Dockerfile Building and Running Container on a Local Machine Pushing an Image to Docker Hub Deploying a Container to ACI with a CI/CD Pineline Managing Containers Effectively with Kubernetes- Installing Kubernetes Kubernetes Architecture Overview Installing Kubernetes Dashboard First Example of Kubernetes Application Deployments	10
Unit VI: Testing Your Applications	Hours
Creating Postman Collection with Requests Installing Postman Creating Collections Creating Our First Request Using Environments and Variables to Dynamize requests Writing postman tests Executing's Postman request tests locally	10

Understanding the Newman Concepts Preparing Postman Collection for Newman Running the Newman Command Line Integration of Newman in the CI/CD pipeline process.	

References:

1. Learning DevOps: The complete guide to accelerate collaboration with Jenkins By Mikael Krief
2. The DevOps Handbook: How to Create World-Class Agility, Reliability, & Security in Technology Organizations Kindle Edition
3. DevOps: A Complete Beginner's Guide to DevOps Best Practices Volume 1 of 1 Series, Jim Lewis, Publisher: Independently Published, 2019, ISBN 1673259146, 9781673259148
4. Effective DevOps: Building a Culture of Collaboration, Affinity, and Tooling at Scale 1st Edition, Kindle Edition

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B. Voc. T. Y. (Semester VI)

BVOC.6.07: Lab 1: ASP.NET Web API

Learning Objectives:

ASP.NET Web API course would enable the students in understanding Basics of Web Development with Web API

i. Learn how to design and use Microservices and Service Oriented Architecture.
ii. Learn fundamental concepts of REST and HTTP
iii. Learn fundamentals of ASP.NET Core Web API
iv. Learn MVC and Routing
v. Creating and Using API with HTML and JQuery Ajax
vi. Learn how to provide web Security

Course Outcomes:

After successful completion of this course, students should be able to:

i. Understands how Service Oriented Architecture Works
ii. Learn to Create REST API
iii. Understands MVC and Routing
iv. Understands Creating and Using API with HTML and JQuery Ajax
v. Understands How to Implements Web Security

1 Study of. NET Core and MFV 6
2 Study of Files and Folders in MVC Web API Projects
3 Creating Rest Services
4 Practical Based on ASP.NET Core Request Processing
5 Practical Based on Creating Controller, Model and Views
6 Practical Based on Creating ASP.NET Core Web Application on Linux
7 Practical Based on GET by ID
8 Practical Based on ASP.NET Core Web API and Routing
9 Practical Based on Link Generation
10 Practical Based on Adding New Resources, Updating Resources, Deleting Resources
11 Practical Based on Apply SSL
12 Practical Based on Implementing JWT Authentication
13 Practical Based on Claims Based Authorization
14 Practical Based on Web Security
15 Creating Simple Web API Based Application Applications

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B. Voc. T. Y. (Semester VI)
BVOC.6.08 Lab 2: Spring Boot

Learning Objectives:

i. To understand how to build complex UIs using Spring Boot.
ii. To understand and use Spring Boot's auto-configuration.
iii. To Make Spring Boot and JDBC work together cleanly.
iv. To Acquire knowledge on creation of software components using Spring Boot and REST API.
v. To be familiar with using Spring Boot starters and start.spring.io to easily create new applications.
vi. To be familiar with Spring Boot's Devtools.

Course Outcomes:

After successful completion of this course, students should be able to:

i. Learn how to build a simple MVC application using Spring Boot
ii. Learn to build RESTful web applications using Spring Boot.
iii. Configure database connectivity via Spring Boot
iv. Understand and use Spring Boot's Actuator
v. Use Actuator endpoints to monitor and manage applications

Lab Work/ Practical List

Programs for the demonstration of all the concepts in Spring Boot.

1. Write a program that demonstrate simple spring boot application.
2. Write a program for demonstration of auto configuration in spring boot.
3. Write a program for developing web application using spring boot.
4. Write a program for customizing Embedded Servlet Containers.
5. Write a program for integrating Spring Boot and Spring JDBC.
6. Write a program for demonstration of Spring Data JPA.
7. Write a program for integrating Spring Boot and MongoDB.
8. Write a program for Unit Testing Rest Services with Spring Boot and Junit.
9. Write a program to implement Integration Tests for Rest Services with Spring Boot.
10. Write a program to demonstrate Spring Boot Actuator.
11. Write a program for implementing Custom Health Indicators.

References:

1. Beginning Spring Boot 2, K. Siva Prasad Reddy, APress Publication
2. Pro Spring Boot 2, Felipe Gutierrez, APress Publication
3. Spring Boot in Action, Craig Walls, Manning Publications
4. Mastering Spring 5.0, Ranga Rao Karanam, Packt Publishing Ltd

B. Voc. in Programming Skills for Software Development

B. Voc. T. Y. (Semester VI)

BVOC.6.09 Lab 3: Cloud Computing

Learning Objectives:

i. To provide students with the fundamentals and essentials of Cloud Computing.
ii. To provide students a sound foundation of the Cloud Computing so that they are able to start using and adopting Cloud Computing services and tools in their real life scenarios.
iii. To enable students exploring some important cloud computing driven commercial systems and applications.
iv. To expose the students to frontier areas of Cloud Computing and information systems, while providing sufficient foundations to enable further study and research.

Course Outcomes:

After successful completion of this course, students should be able to:

i. Explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.
ii. Apply the fundamental concepts in datacenters.
iii. Identify resource management fundamentals and outline their role in managing infrastructure in cloud computing.
iv. Analyze various cloud programming models and apply them to solve problems on the cloud.

1 Introduction to cloud computing.

2 Creating a Warehouse Application in SalesForce.com.

3 Creating an Application in SalesForce.com using Apex programming Language.

4 Implementation of SOAP Web services in C#/JAVA Applications.

5 Implementation of Para-Virtualization using VM Ware‘s Workstation/ Oracle‘s Virtual Box and

Guest O.S.

6 Installation and Configuration of Hadoop.

7 Create an application (Ex: Word Count) using Hadoop Map/Reduce.

8 Case Study: PAAS(Facebook, Google App Engine)

9 Case Study: Amazon Web Services.