Pune District Education Association's
Waghire College of Arts, Commerce & Science,Saswad.
Syllabus For
F.Y.B.Voc. (Computer Software Development)

SEMESTER-I

Course No	Category	Title	Credits		Teaching Scheme (Hours/Week)		Evaluation Scheme and Marks		
			Theory	Pract.	Theory	Pract.	CE	EE	Total
BCSD111	TH	Basic 'C' programming	3		3		50	50	100
BCSD112	TH	Web page designing using HTML,CSS,XML	3		3		50	50	100
BCSD113	TH	Computer fundamental and office automation	3		3		50	50	100
BCSD114	TH	Communication Skill-I	3		3		50	50	100
BCSD115	PR	Practical I (C language)		3		4	50	50	100
BCSD116	PR	Practical II (HTML,CSS,XML)		3		4	50	50	100
BCSD117	PR	On job training		12		16		150	150
TOTAL			**12**	**18**	**12**	**24**	**300**	**450**	**750**

SEMESTER-II

Course No	Category	Title	Credits		Teaching Scheme (Hours/Week)		Evaluation Scheme and Marks		
			Theory	Pract.	Theory	Pract.	CE	EE	Total
BCSD 121	TH	Advanced C Programming	3		3		50	50	100
BCSD 122	TH	Scripting Language (Java Script)	3		3		50	50	100
BCSD 123	TH	Database Management System	3		3		50	50	100
BCSD 124	TH	Business Mathematics	3		3		50	50	100
BCSD 125	PR	Practical I (Advanced C Programming& DBMS)		3		4	50	50	100
BCSD 126	PR	Practical II (JAVASCRIPT,HTML)		3		4	50	50	100
BCSD 127	PR	On Job Training		12		16		150	150
TOTAL			**12**	**18**	**12**	**24**	**300**	**450**	**750**

Course Code: BSD111 **Course Title: Basic 'C' programming**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 45 **Teaching Scheme: Theory 03 Hrs/ Week**
Subject:Basic 'C' programming

CourseObjectives

1. To introduce the foundations of computing, programming and problem- solvingusing computers.
2. To develop the ability to analyze a problem and devise an algorithm to solveit.
3. To formulate algorithms, pseudocodes and flowcharts for arithmetic and logicalproblems
4. To understand structured programmingapproach.
5. To develop the basic concepts and terminology of programming in general.
6. To implement algorithms in the 'C' language.
7. To test, debug and executeprograms.

Course Outcomes:- On completion of this course, students will be able to :

1. Explore algorithmic approaches to problemsolving.
2. Develop modular programs using control structures and arrays in 'C'.

Unit	Topic	No.ofLectures
1	**Problem Solving Aspects** 1.1. Introduction to problem solving usingcomputers. 1.2. Problem solvingsteps. 1.3 Algorithms-definition, characteristics , examples ,advantages andlimitations. 1.4 Flowcharts - definition, notations , examples , advantages and limitations, Comparisonwith algorithms. 1.5 Pseudo codes - notations, examples, advantagesandlimitations. 1.6 Programming Languages as tools, programming paradigms, types of languages 1.7 Converting pseudo-code toprograms. 1.8 Compilationprocess(compilers,interpreters),linkingandloading,syntaxandsemantic errors, testing aprogram Good Programming Practices (naming conventions ,documentation,indentation).	**10**
2	**C' Fundamentals** 2.1 2.1 History of 'C' language. 2.2 Applicationareas. 2.2 Structure of a 'C' program. 2.3 'C' Program development lifecycle. 2.4 Function as buildingblocks. 2.5 'C'tokens 2.6 Character set, Keywords , Identifiers 2.7 Variables, Constants (character, integer, float, string, escape sequences,enumeration constant).	**10**

	2.8 Data Types (Built-in and user defined datatypes). 2.9 Operators, Expressions, types of operators, Operator precedence and Order ofevaluation. 2.10 Character input andoutput. 2.11 String input andoutput. Formatted input andoutput	
3	**Control Structures** 3.1 Decision making structures:-if ,if-else, switch and conditionaloperator. 3.2 Loop control structures:-while ,do while,for. 3.3 Use of break andcontinue. 3.4 Nestedstructures. Unconditional branching (gotostatement).	**09**
4	**Functions** 4.1 Concept of function, Advantages of Modulardesign. 4.2 Standard libraryfunctions. 4.3 Userdefinedfunctions:- declaration,definition,functioncall,parameterpassing(byvalue), returnstatement. 4.4 Recursivefunctions 4.5 Scope of variables and Storageclasses.	**09**
5	**Arrays** 5.1 Concept ofarray. 5.2 Types of Arrays – One , Two and Multidimensionalarray. 5.3 Array Operations - declaration, initialization, accessing arrayelements. 5.4 Memory representation of two-dimensional array (row major and columnmajor) 5.5 Passing arrays tofunction. Array applications - Finding maximum and minimum, Counting occurrences, Linearsearch, Sorting an array (Simple exchange sort, bubble sort), Merging two sorted arrays, Matrix operations (trace of matrix, addition, transpose, multiplication, symmetric, upper/ lower triangular matrix)	**10**
Total		**48**

Reference Books:

1. How to Solveit by Computer, R.G. Dromey, PearsonEducation.
2. Problem Solving and Programming Concept, Maureen Sprankle,7th Edition, Pearson Publication.
3. C: the Complete Reference, Schildt Herbert, 4th edition, McGraw Hill
4. A Structured Programming Approach Using C, BehrouzA. Forouzan, Richard F. Gilberg, CengageLearningIndia
5. The 'C' programming language, Brian Kernighan, Dennis Ritchie,PHI
6. Programming in C ,A Practical Approach, Ajay Mittal ,Pearson
7. Programming with C, B. Gottfried, 3rd edition, Schaum's outline Series, Tata McGraw Hill.
8. Programming in ANSI C, E. Balagurusamy, 7th Edition, McGrawHill.

Course Code: BSD112 **Course Title: Web page designing using HTML,CSS,XML**

Total Credits: 03 **Total Marks: 100**

Total Contact Hours: 45 **Teaching Scheme: Theory 03 Hrs/ Week**

Subject:Web page designing using HTML,CSS and XML

Unit	Topic	No.ofLectures
1	**Introduction to Web Technologies** 1.1 Introduction to Web Technologies 1.2 How the Website Works? 1.3 Software to create your website 1.4 What makes good website? 1.5 Client-Server and its Communication 1.6 Client and Server Scripting Language 1.7 Internet-Basic, Internet Protocols(HTTP,FTP,IP) 1.8 World Wide Web (WWW). 1.9 HTTP request message, HTTP response message 1.10 Types of Websites(Static and Dynamic Websites)	**06**
2	**HTML / HTML5** 1.1 Introduction to HTML 1.2 HTML tags and attributes 1.3 Working with Elements. 1.4 Inserting Image 1.5 Client Server image mapping 1.6 List 1.7 Tables 1.8 Text and Image links 1.9 Frames 1.10 Forms and controls 1.11 Introduction with text box, text area, buttons, List box, radio, checkbox etc.	**10**
3	**CSS** 1.1 Introduction to Style Sheet 1.2 Introduction to Responsive Website 1.3 Types of CSS 1.4 CSS Border, margin, Positioning, color, text, link, background, list, table, padding, image, display properties 1.5 Use of Id & classes in CSS 1.6 Use of &Introduction of CSS3 : Gradients, Transitions, Animations, multiple columns 1.7 Introduction of Bootstrap.	**10**

4	**JAVASCRIPT** 1.1Concept of script, Types of Scripts, Introduction to JavaScript 1. 2. Variables, identifier & operator, control structure. 1.3. Examples on JavaScript operators 1. 4. Functions 1.5. Event Handling in Java Scripts 1. 6. Concept of array, how to use it in JavaScript , types of an array, examples 1.7. Event handling in JavaScript with examples 1.8. Math and date object and examples on it. 1.9. String object and examples on it, and some predefined functions 1.10.DOM concept in JavaScript, DOM objects 1.11.Validations in JavaScript , examples on it. Chapter	**15**
5	XML 1.1 Introduction to XML 1.2Uses of XML 3. Simple XML, 1.3XML key components 1.4 DTD and Schemas, 1.5Using XML with web applications. 1.6Introduction to XSL, XSL elements, transforming with XSLT	**07**
	Total	**48**

Reference Books:

1. Steven Holzner, ‖HTML Black Book‖, Dremtech press.

2. Web Technologies, Black Book, Dreamtech Press

3. Web Applications : Concepts and Real World Design, Knuckles, Wiley-India 4. Internet and World Wide Web How to program, P.J. Deitel& H.M. Deitel Pearson

Course Code: BCSD113 **Course Title: Computer fundamental and office automation**

Total Credits: 03 **Total Marks: 100**

Total Contact Hours: 45 **Teaching Scheme: Theory 03 Hrs/ Week**

Subject: Computer fundamental and office automation

Unit	Topic	No.ofLectures
1	**Introduction to Computer Fundamentals** 1.1 Introduction to Computer 1.2 Computer System Hardware 1.3 Computer Memory Input and Output Devices 1.4 Interaction between User and Computer 1.5 Introduction to Free and Open Source Software Definition of Computer Virus, 1.6 Types of Viruses 1.7 Use of Antivirus software	12
2	**Basics of Operating System** 2.1 Definition of Operating System Objective types, and functions of Operating Systems Working with Windows Operating System 2.3 Introduction of The Desktop 2.4 Structure of Windows 2.5 Windows Explorer 2.6 File and Folder Operations 2.7 The Search 2.8 The Recycle Bin 2.9 Configuring the Screen, 2.10 Adding or Removing New Programs using Control Panel 2.11 Applications in windows (Paint, Notepad, WordPad, Calculator)	12
3	**Introduction to Business Communication Tools** 1.1 MS-Word: Introduction 1.2 Starting MS-Wordand its Components 1.3 MS-Word Screen 1.4 Elementary Working with MS-Word MS-Excel 1.5 Introduction of Starting MS-Excel 1.6 Basics of Spreadsheet 1.7 MS-Excel Screen and Its Components 1.8 Elementary Working with MS-Excel MS-Powerpoint: 1.9 Introduction of Starting MS-PowerPoint 1.10 Basics of PowerPoint 1.11 MS-PowerPoint Screen and Its ComponentsElementary Working with MSPowerPoint	12
4	**Use of Computer in Commerce** 1.1 Introduction 1.2 Data Processing 1.3 Files and Records 1.4 File Organization (Sequential, Direct/Random, Index) Computer Applications in Business – Need and Scope Computer Applications in various fields of Commerce: Personnel Administration 1.5 Accounting, 1.6 Cost and Budgetary Management,	12

	1.7 Purchasing, Banking, Insurance and Stock-broking, 1.8 e-governance Introduction to E-Commerce 1.9 Evolution of E-Commerce, Role of E Commerce 1.10 E-Commerce Framework, 1.11 E-Commerce Categories	
Total		**48**

Course Code: BCSD114 **Course Title:Communication Skill-I**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 45 **Teaching Scheme: Theory 03 Hrs/ Week**
Subject:Communication Skill-I

Course Objectives :-

1. To know the basic requirements of Self awareness and self development
2. To understand the importance of communication, types, barriers of communication for effective communication
3. To understand the etiquettes for corporate grooming & dressing, Email & telephone etiquettes, etiquettes in social and office setting
4. To understand the various types of leadership skills
5. To understand and develop the time management and stress management skills

Unit	Topic	No.ofLectures
1	**Self Awareness&self Development** 1.1 Self Assessment 1.2 Self Appraisal,SWOT, Goal setting - Personal & career - Self-Assessment 1.3 Self Awareness 1.4 Perceptions and Attitudes 1.5 Positive Attitude 1.5 Values and Belief Systems 1.6 Self-Esteem,Self appraisal, Personal Goal setting 1.7 Career Planning,Personal success factors, Handling failure, Depression and Habit, relating SWOT analysis & goal setting, prioritization	9
2	**Communication Skill** 2.1 Importance of communication, 2.2 types, barriers of communication 2.3 effective communication 2.4 Speaking Skills – Public Speaking, Presentation skills, Group discussion-Importance of speaking effectively, speech process, message, audience, speech style 2.5 feedback, conversation and oral skills, fluency and self expression, body language phonetics and spoken English, speaking techniques, word stress, correct stress patterns, voice quality, correct tone, types of tones, positive image projection techniques.	9
3	**Corporate / Business Etiquettes** 1.1 Corporate grooming & dressing, Email & telephone etiquettes, etiquettes in social & office setting Understand the importance of professional behaviour at the work place 1.2 Understand and Implement etiquettes in workplace 1.3 presenting oneself with finesse and making others comfortable in a business setting. 1.4 Importance of first impression, Grooming, Wardrobe, Body language, Meeting etiquettes (targeted at young professionals who are just entering business environment) 1.5 Introduction to Ethics in engineering and ethical reasoning, rights and	8

	responsibilities,	
4	**Interpersonal relationship** 4.1Team work 4.2 Team effectiveness, Group discussion, Decision making - Team Communication. 4.3 Team, Conflict Resolution, Team Goal Setting, Team Motivation Understanding Team Development, Team Problem Solving, Building the team dynamics. Multicultural team activity 4.4 Group Discussion- Preparation for a GD, Introduction and definitions of a GD, Purpose of a GD, Types of GD, Strategies in a GD , Conflict management, Do's and Don'ts in GD	**10**
5	**Leadership skills** 5.1 Leaders' role, responsibilities and skill required - Understanding good Leadership behaviours, Learning the difference between Leadership and Management, 5.2 Gaining insight into your Patterns, Beliefs and Rules, Defining Qualities and Strengths of leadership, Determining how well you perceive what's going on around you, interpersonal Skills and Communication Skills, 5.3 Learning about Commitment and How to Move Things Forward, Making Key Decisions, Handling Your and Other People's Stress, Empowering, Motivating and Inspiring Others, Leading by example, effective feedback	**06**
6	**Other skills** 6.1 Time management- The Time management matrix, apply the Pareto Principle (80/20 Rule) to time management issues, 6.2 To prioritise using decision matrices, to beat the most common time wasters, how to plan ahead, how to handle interruptions 6.3 To maximise your personal effectiveness, how to say "no" to time wasters, develop your own individualised plan of action 6.4 Stress management- understanding the stress & its impact, techniques of handling stress 6.5 Problem solving skill, Confidence building Problem solving skill, Confidence building	**06**
Total		**48**

Course Code: BCSD115 **Course Title: Practical I (Based on BCSD111)**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Practical 04 Hrs/ Week**

Objectives:

1. Get practical knowledge C Programming.
2. Learn Basic Data Types ,Operators ,Nested loops.
3. Learn how to use functions and Arrays.

Unit	Topics	No.of Practicals
1	**Assignment 1:** Data Types and Operators	2
2	**Assignment 2:** Managing Input and Output	2
3	**Assignment 3 :** Decision Making using if and if-else	1
4	**Assignment 4:**Decision Making using Switch	1
5	**Assignment 5 :**Loop Control structures	1
6	**Assignment 6 :**Nested Loops	1
7	**Assignment 7:**functions	2
8	**Assignment 8:** Demonstration of 1-D Arrays	1
9	**Assignment 9:** Demonstration of 2-D Arrays	1
Total`		12

Course Code: BCSD112 **Course Title: Practical II (Based on BCSD112)**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Practical 04 Hrs/ Week**

Objectives:

4. Get practical knowledge of PHP and C.
5. Learn to Works with functions.
6. Learn file handling.

Unit	Topic	No.of Practicals
1	**Assignment 1:** Basic HTML Tags	2
2	**Assignment 2:** Creating List through HTML	2
3	**Assignment3 :** Creating Tables through HTML	1
4	**Assignment 4 :** Creating Frames through HTML	1
5	**Assignment 5 :** Creating Forms through HTML	1
6	**Assignment 6 :** Image Mapping	1
7	**Assignment 7:** Styling HTML with CSS	2
8	**Assignment 8:** JavaScript and xml	2
Total		12

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SEMESTER-II

Course No	Category	Title	Credits		Teaching Scheme (Hours/Week)		Evaluation Scheme and Marks		
			Theory	Pract.	Theory	Pract.	CE	EE	Total
BCSD 121	TH	Advanced C Programming	3		3		50	50	100
BCSD 122	TH	Scripting Language (Java Script)	3		3		50	50	100
BCSD 123	TH	Database Management System	3		3		50	50	100
BCSD 124	TH	Business Mathematics	3		3		50	50	100
BCSD 125	PR	Practical I (Advance C Programming & DBMS)		3		4	50	50	100
BCSD 126	PR	Practical II (JAVASCRIPT,HTML)		3		4	50	50	100
BCSD 127	PR	On Job Training		12		16		150	150
TOTAL			**12**	**18**	**12**	**24**	**300**	**450**	**750**

Course Code: BCSD121 **Course Title: Advanced C Programming**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 45 **Teaching Scheme: Theory 03 Hrs/ Week**

Subject: Advanced C Programming

Course Objectives:-

2. To study advanced concepts of programming using the 'C' language.
3. To understand code organization with complex data types and structures.
4. To work with files.

Unit	Topic	No.ofLectures
1	**Pointers** 1.1. Introduction to Pointers. 1.2. Declaration, definition, initialization, dereferencing. 1.3. Pointer arithmetic. 1.4. Relationship between Arrays & Pointers- Pointer to array, Array of pointers. 1.5. Multiple indirection (pointer to pointer). 1.6. Functions and pointers- Passing pointer to function, Returning pointer from function, Function pointer. 1.7. Dynamic memory management- Allocation(malloc(),calloc()), Resizing(realloc()), Releasing(free())., 1.8. Memory leak, dangling pointers. 1.9. Types of pointers.	10
2	**Strings** 2.1 String Literals, string variables, declaration, definition, initialization. 2.2 Syntax and use of predefined string functions 2.3 Array of strings. 2.4. Strings and Pointers 2.5. Command line arguments.	08
3	**Structures And Unions.** 3.1. Concept of structure, definition and initialization, use of typedef. 3.2. Accessing structure members. 3.3. Nested Structures 3.4. Arrays of Structures 3.5. Structures and functions- Passing each member of structure as a separate argument, Passing structure by value / address. 3.6. Pointers and structures. 3.7. Concept of Union, declaration, definition, accessing union members. 3.8. Difference between structures and union.	12
4	**File Handling** 4.1. Introduction to streams. 4.2. Types of files. 4.3. Operations on text files. 4.4. Standard library input/output functions. 4.5. Random access to files.	10

5	**Preprocessor** 6.1. Role of Preprocessor 6.2. Format of preprocessor directive 6.3. File inclusion directives (#include) 6.4. Macro substitution directive, argumented and nested macro 6.5. Macros versus functions	**08**
Total		**48**

ReferenceBooks:

1. C: the Complete Reference, Schildt Herbert, 4th edition, McGraw Hill
2. A Structured Programming Approach Using C, Behrouz A. Forouzan, Richard F. Gilberg, CengageLearning India
3. The 'C' programming language, Brian Kernighan, Dennis Ritchie, PHI
4. Programming in C ,A Practical Approach, Ajay Mittal , Pearson
5. Programming with C, B. Gottfried, 3rd edition, Schaum's outline Series, Tata McGraw Hill.
6. Programming in ANSI C, E. Balagurusamy, 7th Edition, McGraw Hill.

Course Code: BCSD122 **Course Title: Scripting Language (Java Script)**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Theory 03 Hrs/ Week**

Subject:Scripting Language (Java Script)

Course Objectives :-

2. Understand the JavaScript language & the Document Object Model.
3. Alter, show, hide and move objects on a web page.
4. Check information inputted into a form.
5. Javascript allows programming to be performed without server interaction.

Unit	Top ic	No.ofL ectures
1	**Introduction** 1.1What is the JavaScript? 1.2Advantages of the JavaScript. 1.3 Write the first JavaScript program.	05
2	**Language Syntax** 2.1 Variable declaration 2.2 Operators 2.3 Control Statements 2.4 Error Handling 2.5 Understanding arrays 2.6 Function Declaration	12
3	**Built In Functions** 3.1 Built In Functions 3.2 Standard Date and Time Functions	06
4	**HTML Forms** 4.1 Working with HTML form and its elements	06
5	**HTML DOM** 5.1 HTML Document object Model 5.2Other Document Object Model	06
6	**Cookies** 6.1 Working with cookies	07
7	**Working with Objects and Classes** 7.1 Working with Objects 7.2 Call method in JavaScript 7.3 Inheritance in JavaScript using prototype	06
	Tota l	48

ReferenceBooks1. Complete HTML- Thomas Powel
2. HTML and JavaScript – Ivan Bayross
3. HTML & CSS: The Complete Reference, Fifth Editio

Course Code: BSD123 **Course Title: Database Management System**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Theory 03 Hrs/ Week**

Subject: Database Management System

Course Objectives :-

2. To understand DBMS
3. To understand table queries
4. To understand DML

Unit	Topic	No.ofLectures
1	**File Structure and Organization** 1.1 Introduction 1.2 Logical and Physical Files 1.2.1 File 1.2.2 File Structure 1.2.3 Logical and Physical Files Definitions 1.3 Basic File Operations 1.3.1 Opening Files 1.3.2 Closing Files 1.3.3 Reading and Writing 1.3.4 Seeking 1.4 File Organization 1.4.1 Field and Record structure in file 1.4.2 Record Types 1.4.3 Types of file organization 1.4.3.1 Sequential 1.4.3.2 Indexed 1.4.3.3 Hashed 1.5 Indexing 1.5.1 What is an Index? 1.5.2 When to use Indexes? 1.5.3 Types of Index 1.5.3.1 Dense Index 1.5.3.2 Sparse Index	**06**
2	Database Management System 2.1 Introduction 2.2 Basic Concept and Definitions 2.2.1 Data and Information 2.2.2 Data Vs Information 2.2.3 Data Dictionary 2.2.4 Data Item or Field 2.2.5 Record 2.3 Definition of DBMS 2.4 Applications of DBMS 2.5 File processing system Vs DBMS 2.6 Advantages and Disadvantages of DBMS 2.7 Users of DBMS	**14**

	2.7.1 Database Designers 2.7.2 Application programmer 2.7.3 Sophisticated Users 2.7.4 End Users 2.8 Views of Data 2.9 Data Model 2.9.1 Object Based Logical Model a. Object Oriented Data Model b. Entity Relationship Data Model 2.9.2 Record Base Logical Model a. Relational Model b. Network Model c. Hierarchical Model 2.10 Entity Relationship Diagram(ERD) 2.11 Extended features of ERD 2.12 Overall System structure	
3	Relational Model 3.1 Introduction 3.2 Terms a. Relation b. Tuple c. Attribute d. Cordinality e. Degree of relationship set f. Domain 3.3 Keys 3.3.1 Super Key 3.3.2 Candidate Key 3.3.3 Primary Key 3.3.4 Foreign Key 3.4 Relational Algebra Operations a. Select b. Project c. Union d. Difference e. Intersection f. Cartesian Product g. Natural Join	**08**
4	SQL (Structured Query Language) 4.1 Introduction 4.2 History Of SQL 4.3 Basic Structure 4.4 DDL Commands 4.5 DML Commands 4.6 Simple Queries 4.7 Nested Queries 4.8 Aggregate Functions	**12**
5	Relational Database Design 5.1 Introduction 5.2 Anomalies of un normalized database 5.3 Normalization 5.4 Normal Form 5.4.1 1 NF	**11**

	5.4.2 2 NF 5.4.3 3 NF 5.4.3.4 BCNF	
Total		**48**

ReferenceBooks:

1) Database System Concepts By Henry korth and A. Silberschatz
2) SQL, PL/SQL The Programming Language Oracle :- Ivan Bayross, BPB Publication.
3) Database Systems Concepts, Designs and Application by Shio Kumar Singh, Pearson
4) Introduction to SQL by Reck F. van der Lans by Pearson
5) Modern Database Management by Jeffery A Hoffer ,V.Ramesh, HeikkiTopi ,Pearson
6) Database Management Systems by DebabrataSahoo ,TataMacgrawHill

Course Code: BCSD124 **Course Title: Business Mathematics**

Total Credits: 03 **Total Marks: 100**

Total Contact Hours: 48 **Teaching Scheme: Theory 03 Hrs/ Week**

Subject:Business Mathematics

Course Objectives :-

Unit	Topic	No.ofLectures
1	**Concept of statistics**. 1.1Role of statistics. In informatics business science Tabulation 1.2 Data condensations and tabulation 1.2 Data Condensation and graphical Methods : Raw data ,attributes and variables , classification , frequency distribution ,cumulative frequency distributions.	12
2	**Measures of central tendency and dispersion** 2.1Criteria for good measures of central tendency 2.2 Arithmetic mean 2.3Median and Mode for grouped and ungrouped data 2.4 Combined mean.	12
3	**Ratio, Proportion and Percentage:** 3.1Ratio – Definition 3.2Continued Ratio 3.3Inverse Ration 3.4Proportion 3.5 Continued 3.6Proportion 3.7Direct Proportion 3.8Inverse Proportion 3.9Variation 3.10Inverse Variation 3.11 Joint Variation 3.12 Percentage 3.13 computation of Percentage.	10
4	**Linear Programming Problem (LPP)** 5.1 Concept ofLPP **5.2** Formulation of LPP **4.3 Transportation Problem (T.P.):-** 4.4Concept of Transportation Problem 4.5Initial Basic Feasible Solution 4.6North-West Corner Method (NWCM) 4.7 Least Cost Method (LCM) 4.8Vogal's Approximation Method (VAM).	11
	Total	4

Reference Books:

1) Business Mathematics by Dr. AmarnathDikshit and Dr. Jinendrakumar Jain.
2) Business Mathematics by V. K. Kapoor – Sultan, Chand and sons. Delhi.
3) Business Mathematics by Bari – New Literature publishing company, Mumbai.

Course Code: BCSD125 **Course Title: Practical I (Based on BCSD122)**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Practical 04 Hrs/ Week**

Objectives:
7. Get practical knowledge of Advance C Programming.
8. Learn Concepts of String and Pointers.
9. Learn Structure and Unions.
10. Learn Howto Create Table and Insert values.

Unit	Topic	No.of Practicals
1	**Assignment 1:** Use of Simple Pointers	1
2	**Assignment 2:** Dynamic Memory Allocation	1
3	**Assignment3:**String Handling Using (Standard Library Functions & User Defined functions)	2
4	**Assignment 4 :**Structure and Unions	2
5	**Assignment 5 :**File Handling(Text Files)	1
6	**Assignment 6 :** DDL Commands(Create, Alter, Drop)	2
7	**Assignment 7 :** DML Commands(Insert,Delete,Update)	1
8	**Assignment 8 :** Simple Queries	1
9	**Assignment 9 :** Nested Queries	1
Total		12

Course Code: BCSD122 **Course Title: Practical II (Based on BCSD122)**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Practical 04 Hrs/ Week**

Objectives:
11. Get practical knowledge of JavaScript and HTML.
12. Learn to Works with functions.
13. Learn HTML DOM and Cookies .

Unit	Topic	No.of Practicals
1	**Assignment 1:** Basic JavaScript and HTML	2
2	**Assignment 2:** Variables and Array	2
3	**Assignment3 :** Function	1
4	**Assignment 4 :**HTML with JavaScript	2
5	**Assignment 5 :** HTML DOM	1
6	**Assignment 6 :** Cookies	2
7	**Assignment 7:**Working with Objects and Classes	2
Total		12

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SEMESTER-III

Course No	Category	Title	Credits		Teaching Scheme (Hours/Week)		Evaluation Scheme and Marks		
			Theory	Pract.	Theory	Pract.	CE	EE	Total
BCSD 231	TH	Basic PHP	3		3		50	50	100
BCSD 232	TH	Data Structure	3		3		50	50	100
BCSD 233	TH	Software Engineering	3		3		50	50	100
BCSD 234	TH	RDBMS	3		3		50	50	100
BCSD 235	PR	Practical I(BCSD 231)		3		4	50	50	100
BCSD 236	PR	Practical II(BCSD 232 and 234)		3		4	50	50	100
BCSD 237	PR	On Job Training		12		16		150	150
TOTAL			**12**	**18**	**12**	**24**	**300**	**450**	**750**

SEMESTER-IV

Course No	Category	Title	Credits		Teaching Scheme (Hours/Week)		Evaluation Scheme and Marks		
			Theory	Pract.	Theory	Pract.	CE	EE	Total
BCSD 241	TH	Advanced PHP	3		3		50	50	100
BCSD 242	TH	Digital Marketing	3		3		50	50	100
BCSD 243	TH	OOPS Concept Using CPP	3		3		50	50	100
BCSD 244	TH	Computer Networking	3		3		50	50	100
BCSD 245	PR	Practical I (BCSD 241)		3		4	50	50	100
BCSD 246	PR	Practical II(BCSD 243)		3		4	50	50	100
BCSD 247	PR	On Job Training*		12		16		150	150
TOTAL			**12**	**18**	**12**	**24**	**300**	**450**	**750**

*On Job Training should be carried out in any one subject per semester for the job roles such as:

1. Software Tester

2. Web Designer
3. Technical Support

Semester III

Course Code: BCSD231 **Course Title:** PHP
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Theory 03 Hrs/ Week**

Subject: PHP

Objectives:

1. Understand how server-side programming works on the web.
2. Using PHP built-in functions and creating custom functions
3. Understanding POST and GET in form submission.
4. How to receive and process form submission data.
5. Read and process data in a MySQL database

Unit	Topic	No. of Lectures
1	**PHP Basics** Setting up a development environment Variables, numbers and strings Calculations with PHP Using Arrays	6
2	**Control Structures and Loops** Conditional Statements Using Loops for Repetitive tasks Combing Loops and Arrays	7
3	**Functions, Objects and Errors** PHP's Built-in functions Creating Custom functions Passing Values by Reference Understanding Objects	7
4	**Working with Forms** Building a Form Processing a Form's Data Differences between POST and GET Preserving User Input	7
5	**More with Forms** Dealing with checkboxes and radio buttons Retrieving values from lists Validating and restricting data Sending Email	7
6	**Storing and Protecting Data** Setting and Reading Cookies Protecting Online Files Understanding Session Variables	7

7	**MySQLDatabaseOverview** 7.1 phpMyAdminOverview Using a MySQL Database Reading and Writing Data	**7**
Total		**48**

ReferenceBooks:

1. Php:ABeginner'sGuide1stEditionMcGraw-HillOsborneMedia;1editionbyVikramVaswani
2. Murach'sPHP and MySQL(2ndEdition)byJoelMurachandRayHarris
3. PHP: TheCompleteReferencePaperback– 1 Jul2017byStevenHolzner(Author)

Course Code: BCSD232 **Course Title: DataStructure**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Theory 03 Hrs/ Week**

Objective:

1. To understandtheconceptsofADTs
2. Tolearnlineardatastructures –lists, stacks, andqueues
3. Tounderstandsorting,searchingalgorithms.

Unit	Topic	No.of Lectures
1	**BasicConceptandIntroductiontoDataStructure** Pointersanddynamicmemoryallocation Algorithm-Definitionandcharacteristics AlgorithmAnalysis-SpaceComplexity-TimeComplexity-Asymptotic NotationIntroductiontoData structure TypesofData structure AbstractDataTypes(ADT)IntroductiontoArraysandStructure Types ofarrayandRepresentationofarray Polynomial-PolynomialRepresentation-EvaluationofPolynomial-AdditionofPolynomial	**10**
2	**Lineardatastructures** IntroductiontoArrays -arrayrepresentation Sortingalgorithmswithefficiency Bubblesort,Insertionsort,Mergesort,QuickSort,SelectionSort9d Searchingtechniques–Linear Search, Binarysearch	**8**
3	**LinkedList** IntroductiontoLinkedList ImplementationofLinkedList–Static&Dynamicrepresentation, TypesofLinkedList - SinglyLinkedlist(Alltypeofoperation) - DoublyLinked list(Create,Display) - CircularlySinglyLinkedlist(Create,Display) - CircularlyDoublyLinkedlist (Create,Display) - Generalized linked list–Concept andRepresentation	**10**
4	**Stacks** Introduction Representation-Static&Dynamic PrimitiveOperationsonstack ApplicationofStack ConversionofInfix,prefix,postfix,Evaluationofpostfixandprefix Simulatingrecursionusingstack	**10**
5	Queues Introduction Representation - Static & Dynamic Primitive Operations on Queue Circular queue, priority queue Concept of doubly ended queue	**10**
Total		**48**

ReferenceBooks:

1. FundamentalsofDataStructure - ByHorowitzSahani(Galgotia)
2. DataStructuresusingCandC++ ByYedidyahLangsam,AaronM Tenenbaum,MosheJ.Augenstein
3. IntroductiontoDataStructuresusingC ----- ByAshokKamthane
4. DataStructuresusingC ----- Bandopadhyay&Dey(Pearson)
5. DataStructuresusingC ---- BySrivastavaBPBPublication.

Course Code: BCSD233 **Course Title: Software Engineering**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Theory 03 Hrs/ Week**

Objective:

1. To get knowledge and understanding of software engineering discipline.
2. To learn analysis and design principles for software project development.

Course Outcomes:

1. After successful completion of this course, learner will be able to Compare and contrast various Software Engineering models .
2. Decide on appropriate process model for a developing a software project
3. Classify software applications and Identify unique features of various domains
4. Prepare System Requirement Specification (SRS) for the given problem
5. Design and analyze Data Flow diagrams

Unit	Topic	No.of Lectures
1	**Introduction To System Concept** 1.1 Definition 1.2 Basic Components 1.3 Elements of the system 1.4 Types of System 1.5 System characteristics	10
2	**Introduction To Software Engineering** 2.1 Definition of Software 2.2 Characteristics of Software 2.3Definition of Software Engineering 2.4 Need for software Engineering 2.5The Software Process 2.6 Software Product and process	08
3	**Software Development Life Cycle (SDLC)** 3.1 Introduction 3.2 Activities of SDLC 3.3 A Generic Process Model 3.4 Prescriptive Process models 3.5 Waterfall Model 3.6 Incremental Process Models 3.7 Evolutionary process Models (Prototyping and Spiral Model)	09
4	**Requirement Engineering** 4.1 Introduction 4.2 System Analysis 4.3 Requirement Gathering 4.4 Feasibility study 4.5 Fact Finding Techniques	10

5	**Analysis and Design Tools** 5.1 Decision Tree and Decision Table 5.2 Data Flow Diagrams (DFD) 5.3 Data Dictionary 5.3.1 Elements of DD 5.3.2 Advantages of DD 5.4 Input and Output Design 5.5 Structure Design Concepts 5.6 Structure Chart 5.6 Case Studies on above topics	**08**
6	**Software Testing ,software maintenance and Software Reengineering** 6.1 Definition 6.2 Types Of Testing 6.3 Maintenance Definition And Types 6.4 Software Reengineering	**03**
	Total	**48**

Reference Books:

1. Software Engineering : A Practitioner's Approach - Roger S. Pressman, McGraw hill(Eighth Edition) ISBN-13: 978-0-07-802212-8, ISBN-10: 0-07-802212-6
2.Software Engineering – Bharat BhushanAgarawal and SumitPrakashTayal

Course Code: BCSD234 **Course Title: RDBMS**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Theory 03 Hrs/ Week**

Objective:

1. Familiarize the students with a good formal foundation on the relational model.
2. Outline the various systematic database design approaches.
3. Describe the concepts of transactions and transaction processing.

Unit	Topic	No.of Lectures
1	**Introduction to RDBMS** 1.1 What is RDBMS 1.2 RDBMS Concepts 1.3 Features of RDBMS 1.4 Popular RDBMS Products 1.5 Difference Between DBMS and RDBMS 1.6 Relationship among Application Programs and RDBMS	2
2	**Relational Database Design Using PLSQL** 2.1 Overview of PLSQL 2.2 Features of PLSQL 2.3 Advantages of PLSQL 2.4 Data Types in PLSQL 2.5 PLSQL Block 2.6 Variables in PLSQL 2.7 Attributes in PLSQL 2.8 PLSQL Operators 2.9 Functions used in PLSQL 2.10 Control Statement 2.11 Exception Handling 2.12 Functions 2.13 Procedure 2.14 Cursor 2.15 Trigger	17

3	**Concepts of Transaction Management** 3.1 Transaction concept 3.2 Operation on Transactions 3.3 Schedules of Transaction 3.4 Transaction properties 3.5 Transaction state 3.6 Concurrent Execution 3.7 Concept of Concurrency 3.8 Concurrency Problems 3.9 Serializability 3.9.1 Conflict Serializability 3.9.2 View Serializability 3.10 Recoverability 3.10.1 Recoverable Schedule 3.10.2 cascadless Schedule	**13**
4	**Concurrency control** 4.1 Lock based protocol 4.1.1 Types of Locks 4.1.2 Granting of Locks 4.1.3 Two phase Locking Protocol 4.2 Timestamp Based Protocol 4.2.1 Timestamp Ordering Protocol 4.2.1 Thomas Write Rule 4.3 Validation Based Protocol 4.4 Deadlock Handling 4.4.1 Deadlock prevention 4.4.2 Deadlock Detection 4.4.3 Deadlock Recovery	**8**
5	**Recovery System** 5.1 Introduction 5.1.1 Failures and Errors 5.1.2 Recovery System 5.2 Failure Classification 5.2.1 Transaction Failure 5.2.2 System Crash 5.2.3 Disk Failure 5.3 Recovery and Atomicity 5.3.1 Log Based Recovery 5.3.2 Deferred Database Modification 5.3.3 Immediate Database Modification 5.3.4 Checkpoints 5.4 Recovery with concurrent Transaction 5.4.1 Transaction Rollback 5.4.2 Restart Recovery	**8**
Total		**48**

Reference Books:

1. An Introduction to Database System, Date C. J. - Pearson Education, New Delhi – 2005
2. Relational Database A Complete Guide By Gerardus Blokdyk,2020 Edition

Course Code: BCSD235 **Course Title: Practical I (Based on BCSCD231)**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Practical 04Hrs/ Week**

Objectives:
14. Get practical knowledge of PHP and C.
15. Learn to Works with functions.
16. Learn Session and Cookies .

Unit	Topic	No.of Practical's
1	**Assignment 1:** Basics in PHP	2
2	**Assignment 2: C**ontrol Structure and Loop	2
3	**Assignment 3 :** Arrays and Strings	1
4	**Assignment 4 :** Function, Class and Object	1
5	**Assignment 5:** Working with form and form element	2
6	**Assignment 6 :**Session and Cookies'	1
7	**Assignment 7:** Database	2
Total		12

Course Code: BCSD236 **Course Title: Practical II(Based on BCSD 232 & 234)**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Practical 04 Hrs/ Week**

Objectives:
1.Get practical knowledge of RDBMS and C.
2.Learn to Works with RDBMS Using SQL Queries.
3. Learn to implements Data Structure Algorithms Practically Using C .

Unit	Topic	No.of Practicals
1	**Assignment 1 :** Sorting Techniques	1
2	**Assignment 2:**Searching Techniques	1
3	**Assignment 3:** Linked List	2
4	**Assignment 4: S**tack	1
5	**Assignment 5:** Queue	1
6	**Assignment 6:** PLSQL Block and Control Structure	2
7	**Assignment 7:**Stored Functions	1
8	**Assignment 8:** Stored Procedures	1
9	**Assignment 9:** Cursors	1
10	**Assignment 10:** Triggers	1
Total		12

Semester IV

Course Code: BCSD241 **Course Title: Advanced PHP**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Theory 03 Hrs/ Week**

Objective :

1. Toknow&understandconceptsofinternetprogramming.
2. Understand howserver-sideprogramming worksontheweb.
3. UnderstandingHowto usePHP Framework(Joomla/Druple)

Unit No	Topic	No.ofLectures
1	**IntroductiontoObjectOrientedProgramminginPHP** Classes Objects Introspection Serialization Inheritance Interfaces Encapsulation	6
2	**WebTechniques** Serverinformation Processingforms Stickyforms Settingresponseheaders	4
3	**Databases** Using PHP to access a databases Mysql Database functions Relational databases and SQL Advanced database techniques Sample application	8
4	**XML** IntroductionXML XMLdocumentStructure PHPandXML Thedocumentobjectmodel ThesimpleXMLextension ChangingavaluewithsimpleXML	6
5	**AjaxwithPHP** Understandingjava scriptsforAJAX AJAXwebapplication model AJAX–PHPframework PerformingAJAXvalidation HandlingXMLdatausingphpandAJAX Connectingdatabaseusingphp andAJAX	

7	**PHP Framework (Word Press)** Introduction Word press features How install Word press with wamp ? Team member Gallery Project Users Create Blog Make small project	14
	Total	48

ReferenceBooks:

1. Php:ABeginner'sGuide1stEditionMcGraw-HillOsborneMedia;1editionbyVikramVaswani
2. Murach'sPHP andMySQL(2nd Edition)byJoelMurachand RayHarris
3. PHP: TheCompleteReferencePaperback– 1 Jul2017byStevenHolzner(Author)
4. BuildingWebServiceswithJava, 2ndEdition, S.Grahamandothers, PearsonEdn.,2008. Java WebServices,D.A.Chappell&T.Jewell,O'Reilly,SPD.

Course Code: BCSD242 **Course Title: Digital Marketing**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Theory 03 Hrs/ Week**

Objectives:

1. The aim of this syllabus is to give knowledge about using digital marketing in and as business.
2. To make SWOT analysis, SEO optimization and use of various digital marketing tools.

Unit	Topics	No.ofLectures
1	**E-Commerce** 1.1 Introduction 1.2 Understanding Internet Marketing 1.3 Search Engine Optimization 1.4 Search Engine Marketing 1.5 Email Marketing 1.6 Digital Display Marketing	**8**
2	**Introduction to New Age Media (Digital) Marketing** 2.1 What is Digital Marketing 2.2 Digital vs. Real Marketing 2.3 Digital Marketing Channels 2.4 Types of Digital Marketing(Overview)-Internet Marketing ,Social Media Marketing, Mobile Marketing	**10**
3	**Creating Initial Digital Marketing Plan** 3.1 Content management 3.2 SWOT analysis: Strengths, Weaknesses, Opportunities, and Threats 3.3 Target group analysis EXERCISE: Define a target group	**6**
4	**Marketing using Web Sites** 4.1 Web design 4.2 Optimization of Web sites 4.3 MS Expression Web EXERCISE: Creating web sites, MS Expression	**5**
5	**Search Engine Optimization** 5.1 SEO Optimization 5.2 Writing the SEO content EXERCISE: Writing the SEO	3

	content	
6	**Social Media Marketing** 7.1 Understanding Social Media Marketing 7.2 Social Networking (Facebook, Linkedin, Twitter, etc.) Social Media (Blogging, Video Sharing - Youtube, Photosharing – Instagram, Podcasts) 7.3 Web analytics - levels 7.4 Modes of Social Media Marketing- 7.4.1 **Creating a Facebook page** Visual identity of a Facebook page , Types of publications, Facebook Ads , Creating Facebook Ads , Ads Visibility 7.4.2 **Business opportunities and Instagram options** Optimization of Instagram profiles , Integrating Instagram with a Web Site and other social networks ,Keeping up with posts 7.4.3 **Business tools on LinkedIn** Creating campaigns on LinkedIn , Analyzing visitation on LinkedIn 7.4.4 **Creating business accounts on YouTube** YouTube ,Advertising , YouTube Analytics 7.4.5 **E-mail marketing** E-mail marketing plan , E-mail marketing campaign analysis , Keeping up with conversions 7.5 Digital Marketing tools: Google Ads, FaceBook Ads, Google Analytic, Zapier, Google Keyword Planner EXERCISE: Social Media Marketing plan. EXERCISE: Making a Facebook page and Google Ads	12
6	**Digital Marketing Budgeting** 8.1 Resource planning 8.2 Cost estimating 8.3 Cost budgeting 8.4 Cost control	4
Total		**48**

Reference Books:

1) Digital Marketing for Dummies By Ryan Deiss and Russ Hennesberry

2) Advertising and Promotion: An Integrated Marketing Communications Perspective,

George Belch, San Diego University Michael Belch, San Diego University

3) Advertising Management: Rajeev Batra, John G. Myers, David A. Aaker

4) Belch: Advertising & Promotions (TMH)

5) The Social Media Bible: Tactics, Tools, & Strategies for Business Success by Lon Safko

6) Web Analytics 2.0 – AvinashKaushik

Course Code: BCSD243 **Course Title: Oops Concept Using CPP**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 45 **Teaching Scheme: Theory 03 Hrs/ Week**

Objectives:

1. To Understand how C++ improves C with object-oriented features.
2. To learn the concept of data abstraction and encapsulation.
3. To learn how inheritance promote code reuse in C++.
4. To learn how to overload and override functions in C++.

Unit	Topics	No.of Lectures
1	**Introduction and Beginning With CPP** 1.1 Introduction to Oops 1.2 Basic concepts of Oops 1.3 Advantages and Application's of Oops 1.4 Introduction, features and Application's of CPP 1.5 Input and Output Operators in CPP with example 1.6Tokens, Identifiers, Constants, Literals in CPP 1.7 Data Types and Keywords 1.7 Variables, Declaration of variables, Dynamic initialization of variables, Reference variable 1.8 Operator's in CPP 1.8.1 Scope Resolution operator 1.8.2 Memory Management Operators 1.9 Manipulators 1.10 Functions 1.10.1 function Prototyping 1.10.2 Call by value and call by Reference 1.10.3 Default Arguments 1.10.4. Inline Functions	**10**

2	**Classes and Objects** 2.1 Structure and class 2.2 classes and Objects 2.3 Access specifiers 2.4 defining data members and member functions inside and outside class definition 2.5 simple c++ program using class 2.6 memory Allocation for Objects 2.7 static data members and member functions 2.8 Array of objects, Objects as a function argument 2.9 Friend Function and Friend Class 2.10 Function Returning Objects	**10**
3	**Constructors and Destructors** 3.1 Constructors 3.2 Types of Constructor : Default, Parameterized ,Copy 3.3 Multiple Constructors in class 3.4 Constructors with default argument 3.5 Dynamic Constructor 3.6 Dynamic initialization of Constructor 3.7 Destructor	**6**
4	**4 Inheritance** 4.1 concept of Inheritance 4.2 Defining Base Class and Derived Class 4.3 Types of Inheritance 4.4 Virtual Base Class 4.5 Abstract Class 4.6 Constructors in Derived Classz	**7**

5	**Polymorphism** 5.1 what is polymorphism 5.2 Compile Time Polymorphism 5.2.1 Introduction,Rules for Operators Overloading 5.2.2 Function Overloading 5.2.3 Operator Overloading: Unary and Binary 5.2.4. Operator Overloading: Using friend function 5.2.5. Operator Overloading: Insertion and Extraction Operators 5.2.5. String manipulation using Operators Overloading 5.3 Runtime Polymorphism 5.3.1. This Pointer 5.3.2. Pointers to Objects 5.3.3. Pointer to Derived Classes 5.3.4. Virtual Functions 5.3.5. Pure virtual Functions	7
6	**Input Output Streams** 6.1 C++ streams and stream classes 6.2 Unformatted I/O Functions 6.3 Formatted Console I/O Operations 6.4 Output formatting Using Manipulators 6.5 User defined Manipulators 6.6 Stream Classes for File Operations 6.7 File Operations- Opening, Closing, Updating 6.8 File Updating with Random Access 6.9 Error Handling during File Operatios	5
Total		**45**

ReferenceBooks:

1. The C++ Programmong Language(4th Edition) By BjarneStroustrup
2. C++ Primer(5th Edition) By Stanley B.Lippman,JoseeLajoie, and Barbara E Moo
3. Programming : Principles and Practice Using C++(2008) By BjarneStroustrup

Course Code: BCSD244 **Course Title: Computer Networking**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 45 **Teaching Scheme: Theory 03 Hrs/ Week**

Objectives:

1. To prepare students with basic networking concepts .
2. To get knowledge of data communication, protocols and standards, various topologies and applications of network.
3. Toacquireinformationaboutnetworksecurityandcryptography.

Unit	Topics	No.ofLectures
1	**Introduction to Networks and Network Models** 1.1 Data communication, components, data representation 1.2 Networks, network criteria, network types - LAN, WAN, Switching, The Internet, Accessing the Internet 1.3 Network Software- Protocol hierarchies, Design Issues of the layer, Connection Oriented and Connectionless Services, 1.4 Reference models - OSI Reference Models, TCP/IP Reference model, Connection devices in different layers, Comparison of OSI and TCP/IP Reference Models.	**10**
2	**Lower Layers** 2.1 Communication at the physical layer, data rate limits - Noiseless channel (Nyquist bit rate), noisy channel (Shannon capacity), Performance - bandwidth, throughput, latency, bandwidth-delay product, jitter 2.2 Design issues of Data Link Layer, Services - Framing, flow control, error control, congestion control, Link layer addressing 2.3 Framing Methods - Character Count, Flag bytes with Byte Stuffing, Flags bits with Bit Stuffing, Physical Layer Coding Violations 2.4 The Channel allocation problem, Static and dynamic allocation, Media Access Methods - Taxonomy of multiple-access protocols 2.5 Switching and TCP/IP layers, Types - circuit switching, packet switching and message switching 2.6 Wired LANs - Standard Ethernet characteristics, Addressing, Access method, implementation, Fast and Gigabit Ethernet	**10**

	2.7 Wireless LANs - Architectural comparison, Characteristics, Access control, IEEE 802.11 architecture, Physical layer, MAC sublayer, Bluetooth architecture, Layers	
3	**Network Layer** 3.1 Network layer services - Packetizing, Routing and forwarding, other services 3.2 Open and closed loop congestion control 3.3 IPv4 addressing- Address space, classful addressing, Subnetting, Supernetting, classless addressing, Network address resolution (NAT) 3.4 Forwarding of IP packets- based on destination address, based on label 3.5 Network Layer Protocols- Internet Protocol (IP), IPv4 datagram format, Fragmentation, options 3.6 Mobile IP-addressing, agents, Three phases 3.7 Next Generation IP- IPv6 address representation, address space, address types, IPv6 protocol, packet format, extension header, Difference between IPv4 and IPv6 3.8 Routing - General idea, Algorithms - Distance vector routing, link state routing, path-vector routing	**12**
4	**Transport Layer** 4.1 Transport layer Services- Process-to-process communication, Addressing, Encapsulation and decapsulation, Multiplexing and demultiplexing, Flow control, Pushing or pulling, Flow control, Buffers, Sequence numbers, Acknowledgements, sliding window, congestion control 4.2 Connectionless and Connection-oriented service, Port numbers 4.3 Transport layer protocols- User datagram protocol, user datagram, UDP services 4.4 Transmission Control Protocol - TCP Services, TCP Features, TCP Segment format, three-way handshake for connection establishment and termination, State transition diagram, windows in TCP.	**13**
Total		**45**

Course Code: BCSD245 **Course Title: Practical I (Based on BCSD 241)**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 45 **Teaching Scheme: Practical 04 Hrs/ Week**

Objectives:
1. Get practical knowledge of advanced PHP
2. To know the concept of software testing.
3. Learn various software testing.

Unit	Topic	No.of Practicals
1	**Assignment 1 :** Introduction to object oriented Programming in php	2
2	**Assignment 2:** To Study Web Techniques	2
3	**Assignment 3:** Database	2
4	**Assignment 4:** XML	2
5	**Assignment 5:** PHP with Ajax	2
6	**Assignment 6:** PHP Framework-Word Press	2
Total		12

Course Code: BCSD246 **Course Title: Practical II (Based on BSCD 243)**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 45 **Teaching Scheme: Practical 04 Hrs/ Week**

Objectives:

1. Get Practical Knowledge of C++ Programming
2. Learn how to use Oops Concept(Object, Class, Inheritance, Abstraction, Encapsulation, Polymorphism) Programmatically.

Unit	Topic	No.of Practicals
1	Assignment 1 : Beginning with C++	1
2	Assignment 2:Operators And Functions in C++	2
3	Assignment 3: Classes And Objects	2
4	Assignment 4:Constuctors And Destructors	2
5	Assignment 5: Inheritance	2
6	Assignment 6: Polymorphism	2
7	Assignment 7:Managing Console I/O Operations	1
8	Assignment 8:Working With files	1
Total		12

Pune District Education Association's
Waghire College of Arts, Commerce & Science,Saswad.
Syllabus
for
T.Y.B.Voc.
(Computer Software Development)

SEMESTER-V

Course No	Category	Title	Credits		Teaching Scheme (Hours/Week)		Evaluation Scheme and Marks		
			Theory	Pract.	Theory	Pract.	CE	EE	Total
BCSD351	TH	Core java	3		3		50	50	100
BCSD352	TH	Data Warehouse and Data Mining	3		3		50	50	100
BCSD353	TH	Dot net Technologies	3		3		50	50	100
BCSD354	TH	Big Data (R Programming)	3		3		50	50	100
BCSD355	PR	Practical I on (BCSD 351 and 353)		3		4	50	50	100
BCSD356	PR	Practical II on (BCSD 354)		3		4	50	50	100
BCSD357	PR	On Job Training		12		16		150	150
TOTAL			**12**	**18**	**12**	**24**	**300**	**450**	**750**

SEMESTER-VI

Course No	Category	Title	Credits		Teaching Scheme (Hours/Week)		Evaluation Scheme and Marks		
			Theory	Pract.	Theory	Pract.	CE	EE	Total
BCSD361	TH	Advance java	3		3		50	50	100
BCSD362	TH	Cyber Security	3		3		50	50	100
BCSD363	TH	Software Testing	3		3		50	50	100
BCSD364	TH	Python	3		3		50	50	100
BCSD365	PR	Practical I on (BCSD 361)		3		4	50	50	100
BCSD366	PR	PracticalII on (BCSD 364)		3		4	50	50	100
BCSD367	PR	On Job Training*		12		16		150	150
TOTAL			**12**	**18**	**12**	**24**	**300**	**450**	**750**

*On Job Training should be carried out in any one subject per semester for the job roles such as:

4. Software Tester
5. Web Designer
6. Technical Support
7. Network Support Engg.

CourseCode:BCSD351 **CourseTitle:CoreJavaProgramming**
TotalCredits:03 **TotalMarks:100**
TotalContactHours:48 **TeachingScheme:Theory04Hrs/Week**
Objectives:

1) TolearnObjectOrientedProgramminglanguage
2) Tohandleabnormaltermination ofaprogram usingexceptionhandling
3) Tocreateflatfiles.
4) Implement coreJavaprogramstosolvesimpleproblems.

Unit. No.	Topic	No.of Lectures
1	**Introduction to Java** 1.1 Features of java 1.2 JDK Environment & tools like(java, javac, appletviewer, javadoc, jdb) 1.3 OOPs Concepts Class, Abstraction , Encapsulation, Inheritance, Polymorphism 1.4 Difference between C++ and JAVA 1.5 Structure of java program 1.6 Data types ,Variables ,Operators , Keywords ,Naming Convention 1.7 Decision Making (if, switch), Looping(for, while) 1.8 Type Casting 1.9 Array Creating an array Types of Array - One Dimensional arrays - Two Dimensional array 1.10 String - Arrays , Methods. - StringBuffer class	8
2	**Classes and Objects** 2.1 Creating Classes and objects 2.2 Memory allocation for objects 2.3 Constructor 2.4 Implementation of Inheritance Simple, Multilevel, 2.5 Interfaces 10 1,2 2.6 Abstract classes and methods 2.7 Implementation of Polymorphism 2.8 Method Overloading, Method Overriding 2.9 Nested and Inner classes. 2.10 Modifiers and Access Control 2.11 Packages Packages Concept Creating user defined packages 2.12 Java Built in packages java.lang->math java.util->Random, Date,	8

	2.13 Wrapper classes Creating, Accessing and using Packages Creating jar file and manifest file Wrapper Classes Garbage Collection (finalize() Method) Date and time processing	
3	**Collection** 3.1 Collection Framework. 3.1.1 Interfaces - Collection - List - Set - SortedSet - Enumeration - Iterator - ListIterator 3.1.2. Classes - LinkedList - ArrayList - Vector - HashSet - TreeSet - Hashtable 3.2 Working with maps 3.2.1 Map interface 3.2.2 Map classes - HashMap - TreeMap	8
4	**File and Exception Handling** **Exception** 4.1 Exception types 4.2 Using try catch and multiple catch Nested try, throw , throws and finally 4.3 Creating user defined Exceptions 4.4 Stream Byte Stream Classes Character Stream Classes 4.5 File IO basics 4.6 File operations Creating file Reading file(character, byte) Writing file (character, byte)	12
5	**Applet, AWT and Swing Programming** **Applet** 5.1 Introduction 5.2 Types applet 5.3 Applet Life cycle - Creating applet - Applet tag 5.4 Applet Classes - Color - Graphics - Font	12

	AWT 5.5 Components and container used in AWT 5.6 Layout managers 5.7 Listeners and Adapter classes 5.8 Event Delegation model **Swing** 5.9 Introduction to Swing Component and Container Classes	
	Total No. of lectures	48

ReferenceBooks:-

1) Complete reference Java by Herbert Schildt(5thedition)

2) Java2 programming black books, Steven Horlzner

3) Programming with Java, Aprimer ,Forthedition ,By E.Balagurusamy

4) Core Java Volume-I-Fundamentals, Eighth Edition, Cay S. Horstmann, Gary Cornell, Prentice Hall, Sun Microsystems Press

CourseCode:BCSD352 **Course Title: Data Warehouse and Data Mining**

TotalCredits:03 **TotalMarks:100**

TotalContactHours:48 **TeachingScheme:Theory04Hrs/Week**

Unit	Topic	No.of lectures
1	**Introduction to Data Mining.** 1. Basic Data Mining Tasks. 2. DM versus Knowledge Discovery in Databases. 3. Data Mining Issues. 4. Data Mining Metrics. 5. Social Implications of Data Mining. 6. Overview of Applications of Data Mining.	10
2	**Introduction to Data Warehousing.** 2.1. Architecture of DW 2.2 OLAP and Data Cubes 2. 3. Dimensional Data Modeling-star, snowflake schemas 2. 4. Data Preprocessing – Need, Data Cleaning, Data Integration & 2.5. Transformation, Data Reduction 2. 6. Machine Learning, Pattern MatchingDef& concepts	10
3	**Classification And Prediction** 4.1Decision tree learning Construction, performance, attribute selection 4.2 Issues: Over-fitting, tree pruning methods, missing values,• continuous classes 4.3 Classification and Regression Trees (CART) 4.4. Prediction • Linear regression • Non-linear regression	10
4	**Software for data mining and applications of data mining** 5.1Introducation 5.2 R and Weka tool. 5.3 sample application of data mining	08
5	**Brief overview of advanced techniques** 6.1 Introduction 6.2Active Learning 6.3Text Mining 6.4 Graphical model 6.5 Web mining	10
	Total No .of lectures	48

References:

BI managerial approach by Pearson publication, second edition.

CourseCode:BCSD353 **Course Title: Dot net Technologies**

TotalCredits:03 **TotalMarks:100**
TotalContactHours:48 **TeachingScheme:Theory04Hrs/Week**

Course Objectives:
The primary objective of this course is to provide concepts of .NET framework and different concepts of C# programming language and make students familiar with their uses and applications.

Unit. No.	Topic	No.of Lectures
1	**Introducing C# and the .NET Framework (7 Hrs.)** 1.1Object Orientation 1.2 Type Safety 1.3 Memory Management 1.4 Platform Support; C# and CLR; 1.5 CLR and .NET Framework; 1.6Other Frameworks; 1.7 Framework Overview 1.8.NET Standard 2.0 Applied Technologies	12
2	**The C# Language Basics (12 Hrs.)** 1.1Writing Console and GUI Applications **1.2** Identifiers and Keywords 1.3 Writing Comments 1.4 Data Types 1.5 Expressions and Operators 1.6 Strings and Characters 1.7 Arrays 1.8 Variables and Parameters 1.9 Statements (Declaration, Expression, Selection, Iteration, and Jump Statements); Namespaces	12
3	**Creating Types in C# (12 Hrs.)** 1.1 Classes; 1.2 Constructors and Deconstructions 1.3 this Reference 1.4 Properties; Indexers 1.5 Static Constructors and Classes 1.6 Finalizes; Dynamic Binding; 1.7 Operator Overloading; 1.8Inheritance; Abstract Classes and Methods; base Keyword; Overloading;	12

	Object Type; Struts; Access Modifiers; Interfaces; Enums; Generics	
4	**Advanced C# (14 Hrs.)** 1.1Delegates; **1.2** Events; 1.3Lambda Expressions; 1.4Exception Handling; 1.5 Introduction of LINQ; 1.6 Working with Databases; 1.7 Writing Web Applications using ASP-NET	12
	Total No. of lectures	48

Reference Books:

I. C# 7.0 All-in-One For Dummies (1st Edition), John Paul Mueller, Bill Sempf, Chuck Sphar, John Wiley & Sons, Inc.
2. Professional C# 7 and .NET Core 2.0 (7th Edition), Christian Nagel, John Wiley & Sons, Inc.

CourseCode:BCSD354 **Course Title: Big Data(R Programming)**
TotalCredits:03 **TotalMarks:100**
Total Contact Hours:48 **TeachingScheme:Theory04Hrs/Week**

1. To enable learners to develop expert knowledge and analytical skills in current and developing areas of analysis statistics, and machine learning
2. To enable the learner to identify, develop and apply detailed analytical, creative, problem solving skills.
3. Provide the learner with a comprehensive platform for career development, innovation and further study.

Unit. No.	Topic	No.of Lectures
1	**INTRODUCTION TO BIG DATA** 1.1 Introduction to Big Data 1.2 Types of Digital Data 1.3 Big Data Analytics 1.4 Application of Big data	5
2	**INTRODUCTION TO DATA SCIENCE** 2.1 Basics of Data Analytics 2.2 Types of Analytics – 2.2.1 Descriptive, 2.2.2 Predictive, 2.2.3 Prescriptive 2.2.4 Statistical Inference 2.3 Populations and samples 2.3.1 Statistical modelling, 2.3.2 Probability 2.3.3 Distribution 2.3.4 Correlation 2.3.5 Regression	10
3	**INTRODUCTION TO MACHINE LEARNING** 3.1 Basics of Machine Leaning 3.2 Supervised Machine Learning 3.2.1 K- Nearest-Neighbours, 3.2.2 Naïve Bayes 3.2.3 Decision tree 3.2.4 Support Vector Machines 3.3 Unsupervised Machine Learning 3.3.1 Cluster analysis	20
	3.3.2 K means 3.3.3 EM Algorithm 3.3.4 Association Rule Mining 3.3.5 Apriori algorithms 3.4 Regression Analysis 3.4.1 Linear Regression 3.4.2 Nonlinear Regression	

4	**DATA ANALYTICS WITH R/ WEKA MACHINE LEARNING** 4.1 Introduction 4.2 Data Manipulation 4.3 Data Visualization 4.4 Data Analysis	13
	Total No. of lectures	48

Reference Books:

1. Seema Acharya, SubhasiniChellappan, "Big Data Analytics" Wiley 2015.

2. Jay Liebowitz, "Big Data and Business Analytics" Auerbach Publications, CRC press (2013)

3. ArvindSathi, "BigDataAnalytics: Disruptive Technologies for Changing the Game", MC Press, 2012

Course Code: BCSD355 **Course Title: Practical I (Based on BSC 351 and 353)**

Total Credits: 03 **Total Marks: 100**

Total Contact Hours: 48 **Teaching Scheme: Practical 04 Hrs/ Week**

Unit	Topic	No.of Practicals
1	**Assignment 1 :** Java Tools and IDE, Simple java programs	2
2	**Assignment 2:**Array of Objects and Packages	1
3	**Assignment 3**: Inheritance and Interfaces	1
4	**Assignment 4:** Exception And File Handling	1
5	**Assignment 5:** GUI Designing, Event Handling	1
6	**Assignment 6:** Introduction to Python Programming **(data types)**	2
7	**Assignment 7:** Control Statements **(If, If-else, nested if else programs)**	1
8	**Assignment 8:** Functions	1
9	**Assignment 9:** Lists	1
10	**Assignment 10:** File Handling	1
Total		12

Course Code: BCSD355 **Course Title: Practical I I (Based on BCSD 351 and 353)**

Total Credits: 03 **Total Marks: 100**

Total Contact Hours: 48 **Teaching Scheme: Practical 04 Hrs/ Week**

Unit	Topic	No.of Practicals
1	**Assignment 1 :** Beginning of .NET framework.	2
2	**Assignment 2:** Writing Console applications	2
3	**Assignment 3**: Writing GUI applications	2
4	**Assignment 4:** Creating types in C#	2
5	**Assignment 5:** Event Handling, Exception Handling	2
6	**Assignment 6:** Working with Database	2
Total		12

Course Code: BCSD356 **Course Title: Practical I (Based on BSC 354)**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Practical 04 Hrs/ Week**

Unit	Topic	No.of Practicals
1	**Assignment 1 :** Basic R Programming	2
2	**Assignment 2:** Decision making and loop control structures	2
3	**Assignment 3**: Sting and Function in R Programming	2
4	**Assignment 4:** Vector and List in R Programming	2
5	**Assignment 5:** Array and Matrices in R Programming	2
6	**Assignment 6:** Factor and Data Frame in R Programming	1
7	**Assignment 6:** Data Analysis	1
Total		12

Semester VI

CourseCode:BCSD361 **Course Title: Advanced Java Programming**
TotalCredits:03 **TotalMarks:100**
TotalContactHours:48 **TeachingScheme:Theory04Hrs/Week**
Objectives:

1. To know the concept of Java Programming.
2. To understand how to use programming in day to day applications.
3. To develop programming logic.

Unit. No.	Topic	No.of Lectures
1	**GUI Programming (12 Hrs.)** 1.1Introducing Swing; 1.2 Creating a Frame; 1.3 Displaying Information in a Component; 1.4Working with 2D Shapes; 1.5Using Color; Using Special Fonts for Text; Displaying Images; 1.6Event Handling: Event Handling Basics, Event Classes, Event Listeners and Adapter Classes; 1.7Swing and the MVC Design Pattern; Layout Management; Basic Swing Components	12
2	**Database Programming (7 Hrs.)** 1.1 The Design of JDBC: JDBC Driver Types and Typical Uses of JDBC 1.2 the Structured Query Language 1.3 JDBC Configuration 1.4 Working with JDBC Statements 1.5 Query Execution; Scrollable and Updatable Result Sets; Row Sets	12
3	**JavaBeans (7 Hrs.)** 1.1 What Is a Java Bean? 1.2 Advantages of Java Beans 1.3 Introspection; Properties 1.4 Events, and Methods Design Patterns 1.5 Using BeanInfo Interface 1.6 Bound and Constrained Properties	12

	1.7 Persistence; Customizers 1.8 the Java Beans API; Writing JavaBeans	
4	**Servlets and JSP (14 Firs.)** 1.1 Background; The Life Cycle of a Servlet 1.2 A Simple Servlet; The Servlet API; The javax.servlet Package; Reading Servlet Parameters; The javax.servlet.http Package; 1.3 Handling HTTP Requests and Responses 1.4 Using Cookies; Session Tracking; 1.5 Introduction to JSP; Using JSP; 1.6 Comparing JSP with Servlet; Java Web Frameworks	12
	TotalNo.of lectures	48

ReferenceBooks:-

1. Advanced Java Programming, Uttam K. Roy, Oxford University Press
2. Java: Advanced Features and Programming Techniques, Nathan Clark

CourseCode:BCSD362 **Course Title: Cyber Security**

TotalCredits:03 **TotalMarks:100**

TotalContactHours:48 **TeachingScheme:Theory04Hrs/Week**

Course Objectives:

1. To understand the fundamentals of cyber security.
2. To understand various categories of Cybercrime, Cyber-attacks on mobile, tools and techniques used in Cybercrime and case studies.
3. To have an overview of the Cyber laws and concepts of Cyber forensics.

Course Outcome:-

1. Have a good understanding of Cyber Security and the Tools.
2. Identify the different types of Cyber Crimes.
3. Have a good understanding of Cyber laws
4. To develop Cyber forensics awareness.
5. Identify attacks, security policies and credit card frauds in mobile and Wireless Computing Era.

Unit. No.	Topic	No.of Lectures
1	**Chapter 1:- Introduction to Cyber Crime and Cyber Security** 1.1 Introduction 1.2 Cybercrime: Definition and Origin of the Word 1.3 Cybercrime and Information Security 1.4 Who are Cybercriminals? 1.5 Classifications of Cybercrimes: E-Mail Spoofing, Spamming, Cyber defamation, Internet Time Theft, Salami Attack/Salami Technique, Data Diddling,Forgery, Web Jacking, Newsgroup, Spam/Crimes Emanating from Usenet Newsgroup, Industrial Spying/Industrial Espionage, Hacking,Online Frauds,Computer Sabotage, Email Bombing/Mail Bombs, Computer Network Intrusions, Password Sniffing, Credit Card Frauds, Identity Theft 1.6 Definition of Cyber Security 1.7 Vulnerability, Threats and Harmful acts 1.8 CIA Triad 1.9 Cyber Security Policy and Domains of Cyber Security Policy	10
2	**Chapter 2 :- Cyber offenses and Cyberstalking** 2.1 Criminals Plan: Categories of 10 Cybercrime Cyber Attacks: Reconnaissance, Passive Attack, Active Attacks, Scanning/Scrutinizing gathered Information, Attack (Gaining and Maintaining the System Access), Social Engineering, and Classification of Social Engineering. 2.2 Cyberstalking: Types of Stalkers, Cases Reported on Cyberstalking, Working of Stalking	10

	2.3 Real-Life Incident of Cyber stalking 2.4 Cybercafe and Cybercrimes 2.5 Botnets: The Fuel for Cybercrime, Botnet, Attack Vector 2.6 Cybercrime: Mobile and Wireless Devices – Proliferation - Trends in Mobility 2.7 Credit Card Frauds in Mobile and Wireless Computing Era 2.8 Security Challenges Posed by Mobile Devices 2.9 Authentication Service Security 2.10 Attacks on Mobile/Cell Phones	
3	**Chapter 3:- Tools and Methods Used in Cybercrime** 3.1 Introduction 3.2 Proxy Servers and Anonymizers 3.3 Phishing 3.4 Password Cracking 3.5 Keyloggers and Spywares 3.6 Virus and Worms 3.7 Trojan Horses and Backdoors 3.8 Steganography 3.9 DoS and DDoS Attacks 3.10 SQL Injection	08
4	**Chapter 4 :- Cybercrimes and Cyber security: The Legal Perspectives** 4.1 Introduction 4.2 Cybercrime and the Legal Landscape around the World 4.3 Why Do We Need Cyberlaws: The Indian Context 4.4 The Indian IT Act 4.5 Challenges to Indian Law and Cybercrime Scenario in India 4.6 Consequences of not Addressing the Weakness in Information Technology Act 4.7 Digital Signatures and the Indian IT Act 4.8 Amendments to the Indian IT Act 4.9 Cybercrime and Punishment 4.10 Cyberlaw, Technology and Students: Indian Scenario	07
5	**Chapter 5:- Cyber Forensics** 5.1 Introduction 5.2 Historical background of Cyber forensics 5.3 Digital Forensics Science 5.4 The Need for Computer Forensics 5.5 Cyber Forensics and Digital evidence 5.6 Forensics Analysis of Email 5.7 Digital Forensics Lifecycle 5.8 Challenges in Computer Forensics	06

6	**Chapter 6:- Cybersecurity: Organizational Implications** 6.1 Organizational Implications: Cost of cybercrimes and IPR issues 6.2 Web threats for organizations 6.3 Security and Privacy Implications from Cloud Computing 6.4 Social media marketing 6.5 Social computing and the associated challenges for organizations, Protecting people's privacy in the organization 6.6 Organizational guidelines for Internet usage and safe computing guidelines and computer usage policy	07
	Total No. of lectures	48

Course Code: BCSD363 **Course Title: Software Testing**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Theory 03 Hrs/ Week**

Objectives:-

1. Toknowtheconcept ofsoftwaretesting.
2. ToFindingdefectswhich maygetcreated bythe programmerwhiledevelopingthesoftware.
3. Todevelopprogramminglogic.
4. Toincreasethe confidencein andprovidinginformation aboutthe levelof quality.

Unit No.	Topic	No. oflectures
1	**SoftwareTesting** 1.1Introduction 1.2Natureoferror 1.3Testingprinciples&Testingfundamentals 1.4Debugging	6
2	**ApproachestoTesting– I** 1.1WhiteBox Testing 1.2BlackBox Testing 1.3GrayBox Testing 1.4UnitTesting 1.5 Integration-Top-down 1.6 Bottomup 1.7 BigBangSandwich	10
3	**TestingforSpecializedEnvironments** 1.1TestingGUI's 1.2TestingofClient/ServerArchitectures, 1.3TestingDocumentationandHelpFacilities 1.4TestingforRealTimeSystems	10
4	**SoftwareTestingStrategies&Softwaremetrics** 1.1ValidationTesting 1.2SystemTesting,verification 1.3PerformanceTesting 1.4RegressionTesting,Agiletesting 1.5Acceptancetesting,SmokeTesting, 1.6Load Testing,Introduction,BasicMetrics,ComplexityMetrics	13

5	**SpecializedTesting&Testing Tools(Introduction)** 1.1TestCaseDesign 1.2Junit,ApacheJmeter 1.3WinrunnerLoadrunner,RationalRobot	9
TotalNo.of lectures		**48**

ReferenceBooks:

1. SoftwareEngineering –APractitionersApproach,RogerS.Pressman,TataMcGrawHill
2. SoftwareEngineeringforStudents-AProgrammingApproach,Douglas Bell,Pearson

CourseCode:BCSD364 **Course Title:** Python
TotalCredits:03 **TotalMarks:100**
TotalContactHours:48 **TeachingScheme:Theory04Hrs/Week**

Course Objectives:
1. To learn and understand Python programming basics and paradigm.
2. To learn and understand python looping, control statements and string manipulations.
3. Students should be made familiar with the concepts of GUI controls and designing GUI applications.
4. To learn and know the concepts of file handling, exception handling.

Course Outcomes: On completion of the course, student will be able
1. Define and demonstrate the use of built-in data structures "lists" and "dictionary".
2. Design and implement a program to solve a real world problem.
3. Design and implement GUI application and how to handle exceptions and files.

Unit. No.	Topic	No.of Lectures
1	**Introduction to Python** 1.1 History, feature of Python, setting up path, working with python Interpreter, basic syntax, variable and data types, operators 1.2 Conditional statements-If, If-Else, nested if-else, Examples. 1.3 Looping-For,While,Nested loops, Examples 1.4 Control Statements-Break, Continue, Pass. 1.5 String Manipulation-Accessing String, Basic Operations, String Slices, Function and Methods, Examples. 1.6 Lists-Introduction, accessing list, operations, working with lists, function & methods. 1.7 Tuple-Introduction, Accessing tuples, operations working, function & methods, Examples. 1.8 Dictionaries-Introduction, Accessing values in dictionaries, working with dictionaries, properties, function, Examples. 1.9 Functions-Defining a function, calling a function, types of function, function arguments, anonymous function, global & local variable, Examples.	**16**
2	**Modules and Packages** **2**.1Built in Modules 2.2 Importing modules in python program 2.3 Working with Random Modules. 2.4 E.g. - built-ins, time, date time, calendar, sys, etc 2.5 User Defined functions 2.6.1Structure of Python Modules 2.7 Packages 2.8 Predefined Packages 2.9User defined Packages	**6**
3	**Classes ,Objects and Inheritance** 3.1 Classes and Objects 3.2 Classes as User Defined Data Type 3.3 Objects as Instances of Classes	**8**

	3.4 Creating Class and Objects 3.5 Creating Objects By Passing Values 3.6 Variables & Methods in a Class 3.2 Inheritance 3.2 Single Inheritance 3.2.2 Multilevel Inheritance 3.2.3 Multiple Inheritance 3.2.4 Hybrid Inheritance 3.2.5 Hierarchical Inheritance 3.2.6 IS-A Relationship and HAS-A Relationship	
4	**Unit 4: Exception Handling** 4.1 Python Exception 4.2 Common Exception 4.3 Exception handling in Python (try-except-else) 4.4 The except statement with no exception 4.5 Multiple Exception 4.6 The try-finally clause 4.7 Custom Exception and assert statement	**8**
5	**Unit 5: GUI Programming** 5.1 Introduction 5.2 Tkinter programming 5.4 Tkinter widgets 5.5 Frame 5.6 Button 5.7 Label 5.8 Entry	**10**
	TotalNo.of lectures	**48**

Reference Books:

1.Mark Lutz, Programming Python, O`Reilly, 4th Edition, 2010
2.Dive into Python, Mike
3. Learning Python, 4th Edition by Mark Lutz
4. Programming Python, 4th Edition by Mark Lutz
5.PythonProgramming:An introduction to computer ,John Zelle,3rd Edition.

Course Code: BCSD365 **Course Title: Practical I (Based on BCSD 361)**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Practical 04 Hrs/ Week**

Unit	Topic	No.of Practicals
1	**Assignment 1 :** JDBC Programming	3
2	**Assignment 2:** Multithreading	2
3	**Assignment 3**: Socket Programming	2
4	**Assignment 4:** JSP and Servlet	3
5	**Assignment 5:** Spring And Hibernate	2
Total		12

Course Code: BCSD366 **Course Title: Practical I (Based on BCSD 364)**
Total Credits: 03 **Total Marks: 100**
Total Contact Hours: 48 **Teaching Scheme: Practical 04 Hrs/ Week**

	Python	
Unit	**Topic**	**No. of Practicals**
1	**Assignment 1**Introduction to Basic Python	**2**
2	**Assignment 2**Working with Strings and List	**2**
3	**Assignment3 :** Working with Tuples, Sets and Dictionaries	**1**
4	**Assignment 4 :** Working with Functions, Modules and Packages	**1**
5	**Assignment 5 :** Python Classes and Objects	**1**
6	**Assignment 6 :** Inheritance	**1**
7	**Assignment 7:** Exception Handling	**2**
8	**Assignment 8:** Python GUI Programming using Tkinter	**2**
Total		**12**

BVOC Course Name:- Computer Software Development (BCSD)

F.Y.B.Voc					
SEMESTER-I			**SEMESTER-II**		
Sr. No	Subject Code	Subject Name	Sr. No	Subject Code	Subject Name
1	BCSD111	Basic 'C' programming	1	BCSD121	Advance C programming
2	BCSD112	Web page designing using HTML,CSS,XML	2	BCSD122	Scripting Language (Java Script)
3	BCSD113	Computer fundamental and office automation	3	BCSD123	Database Management System
4	BCSD114	Communication Skill-I	4	BCSD124	Business Mathematics
5	BCSD115	Practical I (C language)	5	BCSD125	Practical I (Advance C language)
6	BCSD116	Practical II (HTML,CSS,XML)	6	BCSD126	Practical II (JavaScript and HTML)
7	BCSD117	On job training	7	BCSD127	On job training
S.Y.B.Voc					
SEMESTER-III			**SEMESTER-IV**		
Sr. No	Subject Code	Subject Name	Sr. No	Subject Code	Subject Name
1	BCSD 231	Basic PHP	1	BCSD 241	Advanced PHP
2	BCSD 232	Data Structure	2	BCSD 242	Digital Marketing
3	BCSD 233	Software Engineering	3	BCSD 243	OOPS Concept Using CPP
4	BCSD 234	RDBMS	4	BCSD 244	Computer Networking
5	BCSD 235	Practical I(BCSD 231)	5	BCSD 245	Practical I (BCSD 241)
6	BCSD 236	Practical II(BCSD 232 and 234)	6	BCSD 246	Practical II(BCSD 243)
7	BCSD 237	On Job Training	7	BCSD 247	On Job Training*
T.Y.B.Voc					
SEMESTER-V			**SEMESTER-VI**		
Sr. No	Subject Code	Subject Name	Sr. No	Subject Code	Subject Name
1	BCSD351	Corejava	1	BCSD361	Advancejava
2	BCSD352	Data Warehouse and Data Mining	2	BCSD362	Cyber Security
3	BCSD353	.Net Technologies(C#)	3	BCSD363	Software Testing
4	BCSD354	Big Data(R Programming)	4	BCSD364	Python
5	BCSD355	Practical I on (BCSD 351and 354)	5	BCSD365	Practical I on (BCSD 361)
6	BCSD356	Practical II on (BCSD 353)	6	BCSD366	PracticalII on (BCSD 364)
7	BCSD357	On Job Training	7	BCSD367	On Job Training