Proposal Form for B.Voc. Programme

Software Development

B Voc. in Software Development: Syllabus and Course description

The syllabus of the course is divided into 6 semesters spread over a span of three years End Semester Exams being held after each semester. The syllabus of the course is divided into various practical modules and subjects that students are taught during the course of their under graduation. The syllabus covers all the aspects related to software development so, as to provide a holistic understanding of the subject to the undergraduate students.

The details regarding the syllabus of the course are mentioned below so, as to provide a reference to the candidates.

papers in the General Education component in each of the three years.

B. VOCATIONAL PROGRAMME: Curriculum for Software Development

B.Vocational (Diploma)- 1 Year

Semester-I	Category/ Mode	Subject	Theory Hours/ Week	Duration of Exams (Hrs)	Marks & Credits			
					IA	Exam	Total	Credit
General Education / General Component	Language -1:	Communication Skill-1	2	3	20	80	100	2
	Language - 2:	Kannada/Hindi	2	3	20	80	100	2
	Core paper- 1 Theory	Programming in C	3	3	20	80	100	3
	Core paper- 2 Theory	Information Technology Tools	3	3	20	80	100	3
	Elective Foundation	Environmental Science & Value Education	2	2	10	40	50	2
Skill Component	Practical-1	Programming in C Lab	6	3	30	120	150	6
	Practical-2	Information Technology Tools Lab	6	3	30	120	150	6
	Project/ Internship	Project-1	6		30 Viva	120	150	6
Total			**30**		**180**	**720**	**900**	**30**

B.Vocational (Diploma)- 1 Year

Semester-II	Category/ Mode	Subject	Theory Hours/ Week	Duration of Exams (Hrs)	Marks & Credits			
					IA	Exam	Total	Credit
General Education / General Component	Language -1:	Communication Skill	2	3	20	80	100	2
	Language - 2:	Kannada/Hindi	2	3	20	80	100	2
	Core paper- 1 Theory	Web Designing	3	3	20	80	100	3
	Core paper- 2 Theory	Relational Database Management System	3	3	20	80	100	3
	Elective Foundation	Fundamental of Indian Constitution	2	2	10	40	50	2
Skill Component	Practical-1	Web Designing Lab	6	3	30	120	150	6
	Practical-2	Relational Database Management System Lab	6	3	30	120	150	6
	Project/ Internship	Project-2	6		30 Viva	120	150	6
Total			**30**		**180**	**720**	**900**	**30**

B.Vocational (Advanced Diploma)-2 Year

Semester-III	Category/ Mode	Subject	Theory Hours/ Week	Duration of Exams (Hrs)	Marks & Credits			
					IA	Exam	Total	Credit
General Education / General Component	Language -1:	Business Communication	2	3	20	80	100	2
	Language - 2:	Kannada/Hindi (Skill Development)	2	3	20	80	100	2
	Core paper- 1 Theory	Java Programming	3	3	20	80	100	3
	Core paper- 2 Theory	Web Programming using PHP	3	3	20	80	100	3
	Elective Foundation	Fundamental of Business Law	2	2	10	40	50	2
Skill Component	Practical-1	Java Programming Lab	6	3	30	120	150	6
	Practical-2	Web Programming Lab	6	3	30	120	150	6
	Project/ Internship	Project-3	6		30 Viva	120	150	6
Total			**30**		**180**	**720**	**900**	**30**

B.Vocational (Advanced Diploma)- 2 Year

Semester-IV	Category/ Mode	Subject	Theory Hours/ Week	Duration of Exams (Hrs)	Marks & Credits			
					IA	Exam	Total	Credit
General Education / General Component	Language -1:	English	2	3	20	80	100	2
	Language - 2:	Kannada/Hindi	2	3	20	80	100	2
	Core paper- 1 Theory	Data Structures using C	3	3	20	80	100	3
	Core paper- 2 Theory	Computer Network Security	3	3	20	80	100	3
	Elective Foundation	Gender Equity & Value Education	2	2	10	40	50	2
Skill Component	Practical-1	Data Structures Lab	6	3	30	120	150	6
	Practical-2	Computer Network Security Lab	6	3	30	120	150	6
	Project/ Internship	Project-4	6		30 Viva	120	150	6
Total			**30**		**180**	**720**	**900**	**30**

B.Vocational (Degree)- 3 Year

Semester- V	Category/ Mode	Subject	Theory Hours/ Week	Duration of Exams (Hrs)	Marks & Credits			
					IA	Exam	Total	Credit
General Education / General Component	Core paper- 1 Theory	Java 2 Enterprise Edition	3	3	20	80	100	3
	Core paper- 2 Theory	Computer Graphics & Multimedia	3	3	20	80	100	3
	Core paper- 3 Theory	Software Engineering	3	3	20	80	100	3
	Core paper- 4 Theory	Python Programming	3	3	20	80	100	3
Skill Component	Practical-1	Java 2 Enterprise Edition	6	3	30	120	150	6
	Practical-2	Python Programming	6	3	30	120	150	6
	Project/ Internship	Project-5	6		30 Viva	120	150	6
Total			**30**		**180**	**720**	**900**	**30**

B.Vocational (Degree)- 3 Year

Semester- VI	Category/ Mode	Subject	Theory Hours/ Week	Duration of Exams (Hrs)	Marks & Credits			
					IA	Exam	Total	Credit
General Education / General Component	Core paper- 1 Theory	Linux and Shell Programming	3	3	20	80	100	3
	Core paper- 2 Theory	Cloud computing	3	3	20	80	100	3
	Core paper- 3 Theory	Android Application Development	3	3	20	80	100	3
	Core paper- 4 Theory	Internet of Things Technology	3	3	20	80	100	3
Skill Component	Practical-1	Shell Programming and Wireframes	6	3	30	120	150	6
	Practical-2	Android Application Development Lab	6	3	30	120	150	6
	Project/ Internship	Project-6	6		30 Viva	120	150	6
Total			**30**		**180**	**720**	**900**	**30**

Detailed Curriculum:

Semester-I Theory: Core paper- 1

PROGRAMMING IN C
UNIT – 1

Overview of C

Importance of C, Sample C programs, Basic structure of C programs, Programming style, executing a C Program.

Constants, Variables, and Data Types

Character set, C tokens, Keywords and identifiers, Constants, Variables, Data Types, Declaration of variables, Assigning values to variables, Defining symbolic constants.

Operators and Expression

Arithmetic operators, Relational operators, Logical operators Assignment operators, Increment and Decrement operators, Conditional operator, Bit wise operators, Special operators, Arithmetic expressions, Evaluation of expressions, Precedence of arithmetic operators, Type conversions in expressions, Operator precedence and associatively, Mathematical functions.

UNIT-II

Managing Input and Output Operations

Reading a character, writing a character.

Decision Making and Branching

Decision making with IF statement, Simple IF statement, IF ELSE statement, Nesting of IF…ELSE statements, ELSE IF ladder, switch statement, ?: Operator, GOTO statement.

Decision Making and Looping

WHILE statement, Do statement, FOR statement, Jumps in loops

Arrays

One–dimensional arrays, Declaration of one-dimensional arrays, initialization of one- dimensional arrays, Two-dimensional arrays, initializing two-dimensional arrays.

UNIT-III

Character arrays and strings

Declaring and initializing string variables, reading string from terminal, Writing strings to screen, Arithmetic operations on characters, Putting strings together Comparison of two strings, String-handling functions.

User- Defined Functions

Need for user-defined functions, multi-function program, elements of user-defined functions, definition of functions, Return values and their types, , function calls, function declaration, category of functions, Nesting of functions, Recursion,–Passing arrays to functions, the scope ,visibility, and lifetime of variables.

UNIT-IV

Structure and Unions

defining a structure, declaring structure variables, accessing structure members, structure initialization, copying and comparing structure variables, Unions, Size of structures.

Pointers

Understanding pointers, accessing the address of a variable, Declaring and initializing pointers, accessing a variable through its pointer.

Text Books

1. E Balagurusawami, Programming in ANSI C, 5th Edition , Tata McGraw Hill.

Reference Books

1. V Rajaraman, Computer Programming C, PHI, NewDelhi,1995.
2. Hutchison R, Programming in C, McGraw Hill, New York,1990.

Semester-I Theory: Core paper- 2

Information Technology Tools

UNIT – 1

Processing Data

Introduction to Computers- Transforming data into information – Processing of data in Computers – factors affecting processing speed (registers, RAM, Intel clock, bus width, cache memory) – CPUs used in personal Computers (just mention – Intel, Motorola and other processors).

Input and Output Devices

The Keyboard, the mouse, the monitor – CRT type – flat type: Active matrix and Passive matrix LCD monitors printers – categories – dot matrix printer (Impact), inkjet and laser printers (non-impact) – Criterion for selection of good monitors and printers.

Operating System and other user interface

Introduction to operating system - functions – the user interface – graphical user interface – the desktop, icons, taskbar, menu, dialogue boxes, command line interface, task switching, classifications example, operating systems in use – UNIX, DOS, LINUX and versions of WINDOWS.

UNIT-II

Storing information in a Computer

Introduction, memory representation, memory hierarchy, Random access memory, Types of RAM, Read-only memory, Types of ROM, RAM, ROM and CPU interaction.
Secondary Storage: – Magnetic storage devices, Optical Storage devices, measuring device performance, Hard disk, Advantages and disadvantages of magnetic disk.

Office automation tools:

Computer software: Introduction, software definition, relationship between software and hardware, software categories,
Word processing software, Spreadsheet software: Excel environment, copying cells using Fill handle, dragging cells, Formulas and functions, Inserting Charts, sorting.

Presentation software: Introduction, PowerPoint environment, creating a new presentation, working with different views, using masters, adding animation, adding transition, running slides.

UNIT-III

Networking and Internet:

Uses of Computer Networks: Business Applications, Home Applications, Mobile Users. OSI Architecture, Network hardware: LAN, MAN, WAN, wireless networks, Home Networks, Internet works.

Network Safety concerns, Network Security tools and services. Safe practices on Social networking.

UNIT-IV

Multi Media Design: (Open-Source Design Tools)

Introduction, Multimedia data streams, sound and audio file formats, images and graphics file formats, data compression and optical storage media, computer animation (only basic steps).

Images and graphics – basic concepts – digital image representation, image format, graphics format, Interface and Drawing Tools in GIMP. Applying Filters, Creating and handling multiple layers, Importing pictures.

Reference Books:

1. Peter Norton, introduction to Computer's, Second edition, TMH
2. Multimedia Computing, communication and application by Rolfsteinmentz , Redson Education
3. IT Tools, R.K. Jain, Khanna Publishing House
4. Information Security & Cyber Laws, Sarika Gupta, Khanna Publishing House
5. Mastering PC Hardware & Networking, Ajit Mittal, Khanna Publishing House

Semester-I Skill Component Practical – 1 PROGRAMMING IN C LAB

1 Write a program to find maximum of three numbers.
2 Write a program to check whether the entered character is alphabet, digit or special character and convert it into uppercase if alphabet s in lower case and vice versa.

3 Write a program to find tax rate for the gross salary of an employee based on the given condition.
Gross<2000-no tax
2000<=Gross<4000-3%
4000<=Gross<5000-5%
Gross>=5000-8%
Implement the above program using switch statement.
4 Write a program to reverse a number and find the sum of Individual digits. Also check whether entered number is palindrome or not.
5 Write a program to find decimal equivalent of a binary number.
6 Write a program to generate n Fibonacci numbers.
7 Write a Program to check whether entered number is a Armstrong number or not.
8 Write a program to generate prime numbers between the given limits.
9 Write a program to generate the following
10 Write a program to find the factorial of entered number.
11 Write a program to read a sentence .Count the number of vowel, consonants present in it(using switch case)
12 Write a program to find the sum of n elements in an array
13 Write a program to input n numbers and sort it in ascending order.
14 Write a program to search a number in a list using linear search.
15 Write a program to find the transpose of the matrix.
16 Write a program to add and subtract two matrices.

17 Write a program to count the numbers of words, vowels, digits in a given string.
18 Write a program to reverse a string without using built-in functions.
19 Write a program to input n numbers and find the sum and average using function.
20 Write a program to find nCr using function.
21 Write a program to find the factorial of a number using recursion.
22 Write a program to exchange the values using pointers.

PARTC

23 Write a program to read the information such as book name, acc no, title, price of n books. Perform a searching of books by specifying accno.

24 Write a program to enter the information of n students like name, register number, marks in 3 subjects into array of structures and display grade for each student.

25 Write a program to enter the information of n employees like name, employee number, and basic salary into an array of structures. Calculate the net salary depending on the following conditions.

1. if Salary<5000
D.A is 40% of Basic Salary, H.R.A is 10% salary, P.F 12% of Gross, IT is Rs 100
2. if Salary>5000
D.A is 50% of Basic Salary, H.R.A is 15% salary, P.F 12% of Gross, IT is Rs 150

Gross= basic salary+DA
Net Salary=Gross Salary+HRA-IT-PF

Semester-I Skill Component Practical – 2 IT Tools Lab

- Spreadsheets, Word, Presentation
- Multimedia Design
- Study of computer components, Booting of Computer and its shutdown
- Practicing some fundamental DOS Commands
- Creating database in MS-Access, structuring with different types of fields and use of query facility for accessing the information
- Project / Practical File
- Viva Voce

Semester-II Theory: Core paper- 1:

WEB DESIGNING

UNIT – 1

Introduction to World Wide Web Concepts
WWW, web server, web browser, internet.
Fundamentals of HTML
Elements, character entities, horizontal rules, line breaks, paragraphs, working with citations quotations and definitions, comments, Working with Text, Formatting text with HTML elements, organizing Text in HTML, Working with Links and URLs, Creating Tables, Working with Images and Colors, Working with Forms

UNIT – II

Overview of JavaScript
Features of JavaScript, using JavaScript in an HTML document, Programming Fundamentals of JavaScript – Lexical Structure, variables, Operators, Control Flow Statements, Popup boxes
JavaScript Functions and Events
Working with Functions, setTimeout() method, setInterval() Method, onclick() event, onload event, Mouse events, reset event, onsubmit event.

UNIT – 1II

Working with Browser Objects
Window object, Navigator Object, History object, screen object, Location object
Working with Document Object
Working with document object collection, Creating Cookies, Deleting Cookies
Validation, Errors, Debugging, Exception Handling and Security
validating forms, exploring errors in JavaScript, debugging JavaScript programs, Handling Exceptions, introducing security in JavaScript.

UNIT – 1V

Overview of CSS
Syntax of CSS, CSS selectors, inserting CSS in HTML document , creating and using external, internal and inline CSS Styles, querySelector() method, querySelectorAll() method,
Backgrounds and Color Gradients in CSS
Background of a webpage – setting the background color and image, Fixing and scrolling a Background Image, setting multiple background images, color properties, gradient properties
Fonts and Text Styles
Font properties in CSS, introducing Web Font, applying CSS to text

Reference Books

1. HTML 5 – Black Book, Dreamtech Publications
2. David Flanagan , Java script The Definitive Guide, Oreilly
3. Reaz Hogue , practical JavaScript programming, Comdex Publication

Semester-II Theory: Core paper- 2:

RELATIONAL DATABASE MANAGEMENT SYSTEM

UNIT -1

Database System Concepts and Architecture.

History of Database Systems, Characteristics of the Database Approach, Actors on the Scene, Workers behind the Scene, Advantages of Using the DBMS Approach, Database Systems versus File Systems. Data Abstraction, Three-Schema Architecture, Data independence, Schemas and Instances, Data models, Database Languages, Database Users, DBA. Structure of Database Systems.

The database system environment, Centralized and Client/Server Architecture for DBMSs, Classification of DBMSs, Entity types, Entity Sets, attributes, keys, relationships, relationship types, roles and structural constraints, Weak entity sets.

UNIT-II

Relational model

Basic Concepts of relational data model, Relational model constraints and relational database schemas-Domain Constraints, Key Constraints, Relational Database Schema, Basic Relational algebra operations-SELECT, PROJECT, Set Operations, Cartesian Product, Renaming.

Design theory of Relational Database

Introduction to Relational database design, Semantics of Attributes, Problems caused by Redundancy-Anomalies, Functional Dependency-Uses of Functional Dependency, Diagrammatic way of showing FDs, Closure Set Properties

UNIT-III

Creation of Database

Creating, changing and dropping the tables, Integrity Constraints specification, maintaining reference integrity constraints, Data insertion, deletion and modification.

Querying the database

Information retrieval using SELECT statement, various features of SELECT statement, Aggregate functions, ORDER BY clause, GROUP BY Clause, HAVING Clause, Working with expressions and sub queries Handling of multiple tables. DCL commands-Grant and revoke. TCL commands-commit, rollback, savepoint.

UNIT-IV

Basic structure of MYSQL

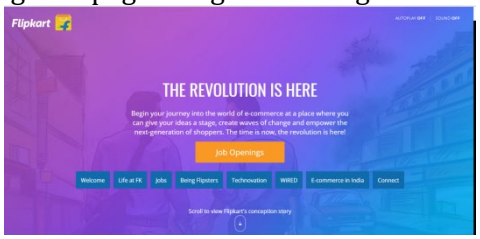
Views: Creation of views, modification, data insertion and limitations of views and assertions.

Introduction to Transaction Processing, Transaction and System Concepts, Desirable properties of transaction.

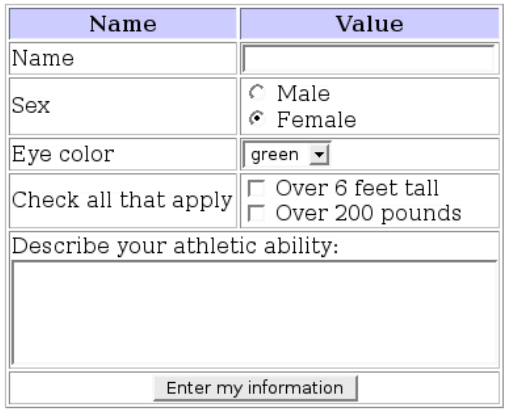
Reference Books :

1. Elmasri and Navathe, Fundamentals of Database Systems, Pearson Education Asia Publication, 4lh edition.
2. Ivan Bayross, SQL, PL/SQL The programming Language – Oracle, BPB Publications
   S. Nanda Gopalan, Data base Management Systems with oracle 9i and VB 6.0, 4th Edition, Sapna Book House Bangalore.(2 unit & 4 unit –Crash Recovery Technique

Semester-II Skill Component Practical – 1 Web Designing Lab

EX NO	PROGRAM TITLE
	PART-A : SIMPLE HTML PROGRAMS
1.	Design the following web page using HTML5 tags **Vision And Mission** This premier institution has been at the service of the youth of Mangalore and its environs, as an educational institution run by the Mangalore Jesuit Educational Society, for the education, formation and professional preparation of young people of all castes, creeds and communities without any discrimination. However, as a minority institution it gives priority to the empowerment of the Christian community. And as an institution run by the Jesuits it places a special accent on preferential option for the poor. With over 13,000 students, boys and girls, from primary to post graduate classes, the campus is knows for its • salubrious atmosphere • community culture • excellence in teaching • high degree of discipline • deep mutual respect • abiding spirit of tolerance • strong appreciation for all cultures • deep reverence for all religions • intense attachment to ethical values • state of the art facilities • multiplicity of avenues for all round growth of the individual • efficient as well as enlightened administration All this have helped us draw appreciative accolades from the University as well as governmental bodies.  Our Patron, St Aloysius, is an inspiration and exemplar for all who come to this campus. Born in a noble family and brought up in relative comfort, this medieval young Italian soon grew tired of living in the lap of luxury, and offered himself to the service of the poor and destitute by joining the Jesuit Order. He died at the age of 23, a victim of charity and service of the poor, having contracted plague while ministering to the plague stricken in Rome. His integrity of life, his inner strength, his noble ideals, his self discipline, his immense compassion and his tremendous concern for the poor are held up for emulation by our students.
2.	Design the following web page using HTML5 tags 
3.	Design the following web page using HTML5 tags

	
4.	Design the following web page using HTML5 tags **Nesting lists** i. item 1 ◦ sub item 1 ◦ sub item 2 a. sub item 1 b. sub item 2 ii. item 2 1. sub item 1 ▪ sub item 1 ▪ sub item 2 2. sub item 2 iii. item 3
5.	Design the following web page using HTML5 tags **4. History of Dessert** 4.1. European 4.2. American 4.3. Ethnic **5. Stories of Dessert** 5.1. Pineapple Cake A. What You Need B. Directions C. Story: Brian's a. Figure 1 b. Figure 2 5.2. Cherry Cobbler A. What You Need B. Directions C. Story: Grandma Flora's a. Figure 1 b. Figure 2 **6. Index of Must Taste**
6.	Design the following web page using HTML5 tags

	
7.	Design the following web page using HTML5 tags 
	HTML PROGRAMS USING STYLESHEETS

1.	 Design the following web page using HTML5 tags. Use hyperlink and external style sheet files to apply the common back groung color, common font style, size and color to the paragraphs and headings of all the pages.
2.	Design HTML page to apply different styles to lists using external Style Sheet.
3.	Design a HTML page to create a table and to format it using external stysheet IDS and classes.
4.	Design HTML page to create a Collapsible using Style Sheet.
5.	Design HTML page to create a dropdown Menu inside a Navigation Bar using Style Sheet.
6.	Design a responsive HTML page to implement local link within the current web page.

Semester-II Skill Component Practical – 2 RDBMS Lab

EX.NO. TABLE & Queries

1. TABLE NAME:Employee_Master

Fields	Data type	Size
Empno	Varchar2	8
Ename	Varchar2	8
Job	Varchar2	8

Sal	Number	8
Date_of_Join	Date	
Commission	Number	8
Dept_no	Varchar2	8

Answer the Following Queries:

1. To retrieve all the column from a table
2. By eliminating duplicate rows retrieve the records from JOB
3. Display those Employee who were joined on before 31.dec.82
4. Display employee name, job, salary multiplied by 0.12.
5. Display the name and salary of those employees who earn less than 5000 & more than 3000.
6. List al employee name with first and last letter as 'A'
7. List the employee who earn commission
8. Give all employee details who don't earn commission for them 10% increase in salary & a commission that is 15% of their salary
9. Sort the order in descending order of Empno.
10. Modify the table by adding Empno as primary key.
11. Find the max and min Salary from Employee table.
12. Create a table called emp_details which has same structure as Employee table.

2. TABLE NAME:client_master

Fields	Data type	Size
Client_no	Varchar2	10
Name	Varchar2	25
Address	Varchar2	25
City	Varchar2	25
State	Varchar2	15
Bal_due	Number	6,2

Answer the Following Queries:

1. Retrieve all the tables created by user.
2. Retrieve the name, client_no and their city from the table
3. Retrieve ClientNo by eliminating duplicate records
4. Sort the data in ascending order of Name
5. Create table Client_master1 from client_master with no records
6. Delete rows from the client_master where the value in the bal_due field is less than 500.
7. Change the content of the field name to 'VijjayKadam' and the content of the field address to set 'Jay Apartments' for the record identified by the field client_no contain the value 'C002'.

8. Add a column pin code to the table client_master
9. Display the details of clients who are not staying in the city MUMBAI, DELHI or BIHAR (use NOT IN clause).
10. Retrieve the content of the column client_no, Name, City & compute 5% of bal_due for column bal_due. Rename bal_due as 'Increase BAL Due'.
11. Count the number of clients in each city
12. Find the maximum and minimum balance due.

3. Table Name:customer_master

Fields	Data type	Size
Cust_no	Varchar2	10
Name	Varchar2	20
Occupation	Varchar2	15
Dob	Date	
Address	Varchar2	20
Account type	Varchar2	2
Salary amount	Number	10,2

Answer the following queries:

1. Describe the structure of the customer table.
2. Show different type of occupations of the customer by eliminating the repeated occupations.
3. Update the address details by changing the city name to Bombay where customer number is 'C001'
4. Change the size of Name field to hold maximum of 30 characters
5. List the customer who were born in the month of January to March
6. List the customer whose name has 6 characters long and first letter as 'A' and last letter also 'A'.
7. List the customer's details of the customers 'Mamta, Roshan, Prachi, and Aruna'.
8. Remove the records from the table where occupation is 'manager'.
9. Find out how many employee are there in each occupation.
10. List customer's details who are having only one account.
11. Display maximum and minimum salary amount for each occupation.
12. Determine occupation where more than 3 people are working.

4. TABLE NAME:Account_Master.

Fields	Data type	Size
Account number	Varchar2	10
Account type	Varchar2	20
Balance amount	Number	10,2

Customer name	Varchar2	10
Date of account created	Date	
Branch number	Varchar2	10

Answer the following queries:

1. Describe the structure of the table account_master.
2. Create a table account_master1 that contains AccNo, and custname with no record.
3. Retrieve all the information from account_master table where Account No is '6990' and account type is 'SB'.
4. Show different type of accounts in the bank eliminating the repeated account types.
5. Display details of customer whose name is 6 characters long and starts from character 'A'.
6. Sort the data in the table in descending order of account number.
7. Find out the total number of accounts verified by each customer.
8. Find out the customer having more than one account in the bank.
9. Find out number of accounts appeared at a branch after 3rd January 2003, only if the number of accounts opened after 3rd January 2003 exceeds 1.
10. List all the details in the order of the month for Account_type .the transaction date should be display in 'DD/MM/YY'
11. Retrieve all the table created by the user.
12. Display the name of the customer who created the account in January.

5. TABLE NAME:Employee_master.

Fields	Constraints	Data type	Size
Empno	Primary key, must start with letter 'E'	Varchar2	10
Empname	Should be in upper case	Varchar2	25
Date_of_birth		Date	
Department	Values are 'production', 'sales','accounts','finance'.	Varchar2	20

TABLE NAME:Employee_Salary.

Fields	Constraints	Data type	Size
Empno	foreign key references employee_master table	Varchar2	10
Salary	Must be greater than 1000	Number	8
Month		Varchar2	20

Answer the following queries:

1. Find the total number of employee working in each department.
2. Find the total salary given to each employee.
3. Find total salary paid in each month of Jan.

4. Find the total number of employees working in production department.
5. Calculate the age of each employee.
6. Display the names of employee having annual salary>25000.
7. Display the name of the oldest and youngest employee of the company.

6. TABLE NAME: Suppliers.

Fields	Constraints	Data type	Size
Supplier_no	Primary key, must start with letter 'S'.	Varchar2	10
Supplier_name	Not null	Varchar2	20
Supplier_Addr	Not null	Varchar2	30
City	Must be Mumbai, Delhi, Kolkata, Karnataka.	Varchar2	15

TABLE NAME:Computer_item.

Fields	Constraints	Data type	Size
Item _no	Primary key	Varchar2	10
Supplier_no	References Suppliers table	Varchar2	10
Item_name	Not null	Varchar2	30
Item quantity	Should be greater than 50	Varchar2	20

Answer the following queries:
1. Create the table suppliers and computer items.
2. List item and suppliers details.
3. List the names of the suppliers who are supplying 'KEYBOARD'.
4. Display the items supplied by 'Shwetha'.
5. Retrieve the supplier's name who supplied more than 5 items.
6. Retrieve item number and supplier details who are located in 'Mumbai'
7. Display the supplier details who are not supplied any items.

7. TABLE NAME:Product_master.

Fields	Constraints	Data type	Size
product_no	Primary key first letter must start with 'P'	Varchar2	6
description	Not null	Varchar2	20
Unit_mesure	Not null	Varchar2	10
Qty_on_hand	Not null	Number	8
Sell_price	Not null cannot be 0	Number	8,2
Cost_price	Not null cannot be 0	Number	8,2

TABLE NAME:Sale_order_details.

Fields	Constraints	Data type	Size
Order_no	Primary key	Varchar2	10
Product_no	foreign key references product number of the product _master table.	Varchar2	6
Qty_order	Not null	Number	6
Qty_disp	It should be >=qty_order	Number	6
Prd_rate		Number	6

Answer the following queries:

1. Find out the product and description of non moving products. i.e product not being sold.
2. Display the description and total quantity sold for each product.
3. Find the value for each product sold.
4. Count the number of products having price greater than or equal to 1500.
5. Display the product name which has the highest selling price.
6. Retrieve the product numbers, their description and total quantity ordered for each product.
7. List the product number and order number of customer having quantity ordered less than 5 from the sales order details table for the product '1.44 floppies.

8. TABLE NAME: Student.

Fields	Constraints	Data type	Size
Roll_no	Primary key	Number	10
Student_name	Not null	Varchar2	15
Class	Not null	Varchar2	10
major		Varchar2	15

TABLE NAME: course

Fields	Constraints	Data type	Size
Course_no	Primary key, starts from character 'C'	Varchar2	6
Course_name	Not null	Varchar2	15
Professor	Not null	Varchar2	33
Dept		Varchar2	35

TABLE NAME: report

Fields	Constraints	Data type	Size
Roll_no	Foreign key references student table	Number	10
Course_no	Foreign key reference course table	Varchar2	6
Grade		Varchar2	2

Answer the following queries:

1. Retrieve names of students majoring in computers.
2. Retrieving student names and course details.

3. Retrieving the names of all students and class who are doing the course taught by professor ‘PRAMADA BASU’.
4. Retrieve the department names of who are offering more than one course.
5. Retrieve the roll number and names of all the students who could get grade ‘A’ in any of their course.

9. TABLE NAME: Employee.

Fields	Constraints	Data type	Size
Ssn number	Primary key	Number	10
Fname	Not null	Varchar2	15
Salary	Not null	Number	10
Superssn		Number	10

TABLE NAME:Workson.

Fields	Constraints	Data type	Size
Essn	foreign key reference employee(Ssn number)	Number	10
Pno	Foreign key reference Project(Pno)	Number	10
Hours	Not null	number	10

TABLE NAME: Project

Fields	Constraints	Data type	Size
Pname	Not null	Varchar2	25
Pno	Primary key	Number	10
Plocation	Not null	Varchar2	20
Dname	Not null	Varchar2	25

Answer the following queries:

1. Display the total salary of the employee working in ‘research’ department.
2. Display all employee names who were not assigned any projects.
3. Display all the employee names who are working on project ‘New benefits’.
4. Create a view to display the manager’s name of employee ‘Jhon’.
5. Create a view to display all the project names in which ‘Smith’ is working.

Semester-III Theory: Core paper- 1:

JAVA PROGRAMMING

UNIT -1

An Overview of Java

Object Oriented Programming – abstraction, the three principles - Encapsulation, Inheritance, and Polymorphism, Encapsulation, Inheritance and polymorphism work together, A first Simple Program- Entering the Program, Compiling the Program, A Closer look at the First Sample Program.

Data Types, Variables and arrays

The primitive Types , Variables - Declaring a variable, dynamic initialization, the scope and lifetime of variables, Operators ,Control Statements , Type conversion and Casting - Java's Automatic Conversions, Casting Incompatible Types, Automatic Type Promotion in Expressions, The Type Promotion Rules. Arrays - One Dimensional Array, Multidimensional Arrays, Alternative Array Declaration Syntax.

UNIT-II

Introducing Classes

Class Fundamentals - The General Form of a Class, A simple class, Declaring Objects, Assigning Object Reference variables**,** Introducing methods - Adding a method to a class, returning a value, adding a method that takes Parameters. Constructors - Parameterized Constructors, the 'this' keyword - Instance variable hiding. Garbage Collection – The finalize () Method.

A closer look at Methods and Classes

Overloading Methods, overloading Constructors, using Objects as Parameters, a closer look at argument passing, returning objects, introducing access control, understanding static, introducing final, introducing nested and inner classes, using command line arguments.

Inheritance

Inheritance basics, member access and inheritance, a super class variable can reference a subclass Object, using Super, using super to call Super class Constructor, a second use for super, Creating a Multilevel Hierarchy, when Constructors are called, method overriding, dynamic method dispatch, Overriding methods, applying method overriding, using abstract classes, Using Final with Inheritance - Using Final to Prevent Overriding, Using final to Prevent Inheritance, The Object Class.

UNIT-III

String Handling

the string constructors, string length, string length, special string operations, character extraction, string comparison, searching string, modifying a string, data conversion, changing the case of characters, additional string methods, String Buffer, additional string buffer methods, Vector class.

Interfaces and Packages

defining an interface, implementing interfaces, accessing implementations through references, partial implementations, nested interfaces, applying interfaces, variables in interfaces, interfaces can be extended.

Packages

Defining a Package, Finding Packages and CLASSPATH, Access Protection, Importing Packages.

UNIT-IV

Exception Handling

exception handling fundamentals, Exception types, uncaught Exceptions, using try and catch, displaying a description of an Exception, multiple catch clauses, nested try statements, throw, finally, java's built -in exceptions, creating your own exception subclasses, chained Exceptions, using exceptions,

Reference Books

1. Herbert Schildt , The Complete Reference – Java-2, Published by Tata McGraw Hill India.
2. Balaguruswamy, Programming with Java – A PRIMER, Tata McGraw Hill 2nd Edition.
3. P.Koparkar , Java for you by, PHI.
4. Naughton , Java Handbook, TMH.

Semester-III Theory: Core paper- 2:

WEB PROGRAMMING USING PHP

UNIT – I

Introducing PHP

History, unique features, basic development concepts, creating the first PHP script, handling Script Errors, Mixing PHP with HTML, escaping special characters.

Using variables and operators

Creating and destroying Variables, inspecting variable contents, PHP data types, setting and checking variable data types, using constants, manipulating variables with operators, handling form inputs.

Controlling program flow

Conditional statements, loops, working with strings and numeric functions.

Working with arrays:

Storing data in arrays, processing arrays with loops and iterators, working with array functions, working with date and time

UNIT II

Using functions and classes

Creating user defined functions, understanding variable scope, using recursive functions
Creating classes, Using advanced OOP concepts – using constructors and destructors, extending classes, adjusting visibility settings

UNIT – III

Working with data bases and SQL

Introducing data bases and SQL, creating the data base, Manipulation of data base, adding or modifying data, using php'sMySQLi extension,

Working with cookies, Sessions and Headers

Working with cookies – Cookie Basics, Cookie attributes, Cookie Headers, Setting Cookies, Reading Cookies, removing Cookies.
Working with sessions – Session Basics, Creating Sessions and Session Variables, Removing and Session Variables
Using HTTP Headers

UNIT – IV

Handling errors

Handling script errors, controlling script Reporting, Using a custom Error Handler, Using exceptions Using custom Exceptions, Logging Errors, Debugging errors

Securing PHP

Sanitizing Input and Output – Securing Data, Securing Configuring Files, Securing Database Access, securing sessions.
Validating User Input, Configuring PHP Security

Reference Books

1. PHP: A BEGINNER'S GUIDE PHP by VikramVaswani, TATA McGRAW – HLL
2. Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML, and AJAX, Black Book (New)by Kogent Learning Solutions Inc
3. PHP: The Good Parts: Delivering the Best of PHPby Peter MacIntyre
4. JavaScript The Definitive Guide, By David Flanagan by Oreilly

Semester-III Skill Component Practical – 1 JAVA PROGRAMMING Lab

PART A

SL NO	PROGRAM
1	Write a Java Program to accept Integers from the user, ask for Lower and Higher integer limits, and then Compute the following:

a. Sum of Integers that are Inside the Range
b. Sum of Integers that are Outside the Range

2 Write a Java Program to perform Binary Search in an Array of Integers taken by the user using Command Line Arguments.

3 Write a Java Program to generate 'n' Fibonacci Series and display only Prime Numbers present in it.

4 Write a Java Program to find the Number of Digits and Sum of Individual Digits of all integers between 100 and 200 that are Divisible by 7.

5 Define a class 'Sort' with the following methods: sortArray, mergeArray, getArray.
Write a Java Program to Merge two Sorted Arrays so that the Resultant Array is also Sorted in Ascending Order.

6 Define a class 'Matrix' with the following methods: addMatrices, subtractMatrices, multiplyMatrices, getMatrix.
Write a Menu Driven Java Program:
a. Accept values in the Matrices
b. Display Matrices
c. Add Matrices
d. Subtract Matrices
e. Multiply Matrices
f. Exit

7 Write a Java Program to Extract the String between the given Range
a. With using substring method
b. Without using substring method

8 Write a Java Program to Search for a String in an entered String
a. With using substring method
b. Without using substring method

9 Write a Java Program to Check if the Numbers in an Array are in Ascending Order or Descending Order or Random Order or Equal.

10 Write a Java Program to accept a Number and find the Reverse of the Number, Sum of the Individual Digits in the Number and Check if the Number is Palindrome or not.

PART B

SL. NO Program

11 Define a super class 'Cuboid' with member's length, breadth, height and all possible Constructors. Derive a subclass 'SpecialCube' with a member weight and all possible Constructors. Write a main class to Create Objects of superclass and subclass using various Constructors and Display those Objects.

12 Define a superclass 'Employee' with member's employeeNumber, employeeName, basicSalary with a Constructor to initialize these members.Derive a subclass 'Salary' with member's dearnessAllowance, houseRentAllowance, providentFund, insurance, grossSalary, netSalary. Define a Constructor to invoke the superclass Constructor. Define a method getNetSalary with the following Calculations:
dearnessAllowance is 45% of basicSalary
houseRentAllowance is 7% of basicSalary
providentFund is 10% of basicSalary
insurance is Rs. 640/-

Write a main class to Demonstrate Single Level Inheritance.

13 Write any Java Program of your own to Demonstrate Multi-level Inheritance.

14 Write a Menu Driven Java Program to Demonstrate Mathematical Operations: addition, subtraction, multiplication, division, remainder using static methods.

15 Define a package 'temperature' with necessary classes and methods to convert Temperature to Fahrenheit and vice-versa.
Define another package 'interest' with necessary classes and methods to calculate Simple Interest.
Write a main class to test these packages.

16 Define an interface 'Area' with a member PI and necessary computing methods. Define classes 'sphere' and 'Circle' which implement the interface. Write a main class to Create Objects of the classes and call the methods.

17 Define an abstract class 'Shape' with abstract methods readShape, findArea. Derive classes 'Triangle' and 'Rectangle' from the abstract class and define the methods. Write a main class to Create Objects of the classes and call the methods.

18 Define a class 'Product' with Product Details as its members.
Write a Menu Driven Java Program 'Shopping' which will allow the user to Add, Delete and Display the Products using Vectors.

19 Write a Java Program to Search for the String 'India' in a given set of Strings; if found convert the String to 'Bharath', if not found then throw a user-defined Exception 'NoMatchException'.

20 Write a Multithreaded Java Program to generate Multiplication of three given Numbers using different Priorities for different Threads.

21 Write a Multithreaded Java Program to generate First 10 Even and Odd Numbers using different Threads.

Part C

22 Write an Applet Program to display Three Numbers and also the Maximum of the Three Numbers.

23 Write an Applet Program to generate and Display Fibonacci Series between the Limits.

24 Write an Applet Program to display the given String, Reverse of the String and whether it's Palindrome or not.

25 Write an Applet Program to Sum the Individual Digits in a Number till it becomes a Single Digit Number and Display that Sum.

26 Write an Applet Program to display a Marquee.

Semester-III Skill Component Practical – 2 WEB PROGRAMMING Lab

1. Simple PHP Program

2. PHP program with sessions cookies strings or arrays

3. Database connectivity Program

Semester-IV Theory: Core paper- 1:

DATA STRUCTURES USING C

UNIT - 1

Linear Data Structure and their sequential storage representation

Algorithm notation, concept and terminology for non-primitive Data structures, Storage structures for arrays, Structures and arrays of structures, Stacks, Definitions and Concepts, Operating on stacks, Applications of stacks, Queues, priority Queues.

12 HOURS

UNIT-II

Linear Data Structure and their Linked storage representation

Pointers and Linked Allocation, Linked linear lists, Operations on Linear lists using singly linked storage structures, Circularly Linked linear lists, Doubly Linked linear

12 HOURS

UNIT-III

Nonlinear Data Structures- Trees

Definition and concepts, operations on binary trees, linked storage representation of binary trees, tree creation and traversal.

Graphs

Matrix representation of graphs, Breadth First Search, Depth First Search.

12 HOURS

UNIT-IV

Sorting and Searching

Sorting, Selection Sort, Bubble Sort, Merge Sort, Quick Sort, Heap Sort, Searching, Sequential Searching, Binary Searching, Search Tree. **12 HOURS**

Text Books

1. An Introduction to Data Structures with Applications 2nd edition – J.P. Trembly and Sorenson, McGraw Hill 2000.

Reference Books

1. Data structures using C & C++ by YedidyahLangsun, Moshe J Augenstein, Teneinbaum published by Prentice Hall of India Ltd.
2. Algorithms + Data Structures = Programs by Niklaus Wirth Prentice Hall 1976
3. Data Structures and Algorithms by Aho, A.V. Hopcroft and Ullman ,J.E. Addison Wesley, 1980.
4. Data Structure and algorithms by Padma Reddy.
5. Fundamentals of Data Structures by Horowitze, E and Sahni,S , Galgotia bookstore.
6. Data Structures and program design by Robert, L.Krunse,PHI.
7. Data and File Structures by Mary Lunis , PHI.

Semester-IV Theory: Core paper- 2:

COMPUTER NETWORK SECURITY

UNIT-I

Network Concept, Benefits of Network, Network classification (PAN, LAN, MAN, WAN), Peer to Peer, Client Server architecture, Transmission media: Guided & Unguided, Network Topologies. Networking terms: DNS, URL, client server architecture, TCP/IP, FTP, HTTP, HTTPS, SMTP, Telnet OSI and TCP/IP Models: Layers and their basic functions and Protocols, Comparison of OSI and TCP/IP. Networking Devices: Hubs, Switches, Routers, Bridges, Repeaters, Gateways and Modems, ADSL.

UNIT-II

Ethernet Networking: Half and Full-Duplex Ethernet, Ethernet at the Data Link Layer, Ethernet at the Physical Layer. Switching Technologies: layer-2 switching, address learning in layer-2 switches, network loop problems in layer-2 switched networks, Spanning-Tree Protocol, LAN switch types and working with layer-2 switches, Wireless LAN

UNIT- III

Internet layer Protocol: Internet Protocol, ICMP, ARP, RARP. IP Addressing: Different classes of IP addresses, Sub-netting for an internet work, Classless Addressing. Comparative study of IPv4 & IPv6. Introduction to Router Configuration. Introduction to Virtual LAN.

UNIT- IV

Transport Layer: Functions of transport layer, Difference between working of TCP and UDP. Application Layer: Domain Name System (DNS), Remote logging, Telnet, FTP, HTTP, HTTPS. Introduction to Network Security.

Reference Books:

1. Information & Computer Security, Sarika Gupta, Khanna Publishing House
2. An Integrated Approach to Computer Networks, Bhavneet Sidhu, Khanna Publishing House

Semester-IV Skill Component Practical – 1 DATA STRUCTURES Lab

LIST OF PROGRAMS

C program to search an element using binary search method.
C program to sort element using selection sort method.
C program to sort element using merge sort method.
C program to sort element using quick sort method.
C program to implement stack operations using arrays

C program to implement queue operations using arrays.

C program to evaluate postfix expressions.
C program to implement Circular queue using arrays.
C program to implement Dqueue using arrays.
C program to implement stack using linked list.
C program to implement queue using linked list.
C program to create a singly linked list to perform all the operations.
a) Insert at the beginning.
b) Insert at the end.
c) Insert at a given position
d) Insert in order.
e) Delete at the beginning.
f) Delete at the end.
g) Delete at a given position.
h) Delete in order.
i) Search for an element in the list.
j) Count number of nodes.
k) Display all the elements.
C program to create a tree and traverse Binary Search Tree.

Semester-IV Skill Component Practical – 2 Computer Network Security Lab

1. Identification of Connectors and Cables:
a. Connectors: BNC, RJ-45, I/O box
b. Cables: Co-axial, twisted pair, Optical fibre.
2. Identification of various networks components
a. NIC (network interface card)
b. Hub, Switch, Router.
3. Execution of basic networking Commands: Netstat, IPConfig, IfConfig, Ping, Arp-a, Nbtstat-a, Netdiag, Nslookup, Traceroute, Pathping
4. Design Ethernet Cables: Cross Cable, Straight Cable, Rollover Cable.
5. Demonstration to connect two computers with/without connecting device.
6. Demonstration of File sharing & Printer sharing.
7. Study of various topologies using topology trainer
8. Detailed study of Network and Internet Settings on PC.
9. Trouble shooting of networks & Installation of network device drivers.
10. Study of Router Configuration.

11. Logging into a router, Editing and Help features and Saving Router configuration.
12. Setting the Hostname, Descriptions, IP Address, and Clock Rate on a Router.

Semester-V Theory: Core paper- 1:

JAVA 2 ENTERPRISE EDITION

UNIT - 1

Introducing J2EE

Need for Enterprise Computing, The J2EE Advantage: Platform Independence, Managed Objects, Reusability, Modularity. Enterprise Architecture Types: Single – Tier Systems, 2- tier Architecture, 3- Tier Architecture, n-Tier Architecture, Architecture of J2EE. Introducing J2EE Runtime and J2EE APIs.

Types of J2EE Technologies: Introducing J2EE Components, Containers and Connectors. Introducing J2EE Service Technologies, Introducing J2EE Communication Technologies.

UNIT-II

Java DataBase Connectivity

Getting Started with JDBC - Introducing JDBC, JDBC Components, JDBC Features, JDBC Architecture, Types of JDBC Drivers,

Working with JDBC API – Major Classes and Interfaces, Communication with Databases by using JDBC APIs.

Implementing JDBC Statements and ResultSets,

JDBC Statements, working with Statement, Methods of Statement Class, Working with PreparedStatement interface, Comparing Statement and PreparedStatement Objects, Describing setters of PreparedStatement, Advantages and disadvantages of PreparedStatement, Using PreparedStatement, working with ResultSet Interface, Using Result Set.

UNIT-III

Java Servlets:

Introduction to Java Servlets, Benefits of Using a Java Servlet, A Simple Java Servlet, Anatomy of a Java Servlet, Deployment Descriptor, Reading Data from a Client, Reading HTTP Request Headers, Sending Data to a client and Writing the HTTP Response Header, Working with cookies, Tracking Sessions.

UNIT-IV

Java Server Pages:
Introduction to JSP – Understanding JSP, Advantages of JSP over Servlets, the JSP architecture, JSP Life Cycle, Creating Simple JSP Page,
Working with JSP Basic Tags and Implicit objects- Scripting Tags, Implicit Objects, Directive Tags
Working with JavaBeans and Action Tags – JavaBean, Advantages of Using Beans, Action Tags

Reference Books

1. Java Server Programming, J2EE 1.4 Edition, Black Book, Dreamtech Software Team (Unit I)
2. Santhosh Kumar K, JDBC Servlet, and JSP, Black Book, Dreamtech Press (Unit II & Unit IV)
3. Jim Keogh ,The Complete Reference J2EE, TATA McGraw-Hill Edition (Unit III)

Semester-V Theory: Core paper- 2:

COMPUTER GRAPHICS AND MULTIMEDIA

UNIT -1

Introduction: Output technology – Raster and Vector display system, Software portability and Graphic Standards, Conceptual Framework of Interactive Graphics
Basic Raster Graphics Algorithm for drawing 2D primitives:
Scan converting Lines –DDA Algorithm, Midpoint line algorithm, Scan converting Circles- Eight way Symmetry, Midpoint Circle Algorithm, Scan Converting Ellipses

UNIT-II

Filling Primitives
Filling rectangles, filling polygons- Horizontal edges, Slivers, Filling Ellipse arcs, pattern filling, Thick primitives, Line Style and Pen Style, Basic Filling Algorithms- Flood Fill and boundary fill.
Clipping
Clipping in a Raster World, Clipping lines – clipping endpoints, Cohen Sutherland Line-Clipping algorithm, Clipping circles and ellipses, clipping polygons, Generating characters- Defining and clipping characters.

UNIT-III

Geometric Transformations

2D Graphics -2D transformations, Homogenous co-ordinates and Matrix representation of 2D transformation, Composition of 2D transformation, Window to View port transformation
3D Graphics -Matrix representation of 3D transformation, Composition of 3D transformation, Transformation as change in coordinate systems, Viewing in 3D –Projections

UNIT-IV

Multimedia

Introduction, Multimedia data streams , sound and audio file formats , images and graphics file formats , data compression and optical storage media ,computer animation(only basic steps).
Media and data streams- Medium and main properties of multimedia Sytsems, Sound/Audio – Basic sound concepts, Computer representation of sound, audio formats
Images and graphics – basic concepts – digital image representation, image format, graphics format

Reference Books

1. Foley J. D Van Dan A. Fundamentals of interactive computer Graphics ,AddisonWasley.
2. Multimedia Computing, communication and application by Rolfsteinmentz , Redson Education
3. Hearn d Baker P.M Computer Graphics (PHI)
4. Rogers D.F Adam J : Mathematical Elements for Computer Graphics ,McGraw Hill
5. Harrington D: Computer Graphics – A programming approach, Tata McGraw
6. Hill
7. Foley J. D Van Dan A, Feiner S. K and Hughes : Computer Graphics Principles and practice ,Addison Wesley.
8. Giloi W.K :Interactive Computer Graphics, prentices Hall

Semester-V Theory: Core paper- 3:

SOFTWARE ENGINEERING

UNIT I

Introduction:
Introduction to software, Types of software, classes of software, introduction to software engineering, software components, characteristics, software engineering processes, some terminologies.
Software Development Life Cycle Models

Software development life cycle, waterfall model, prototyping model, spiral model, evolutionary development model, Iterative enhancement model.

Introduction to software requirement specification

Types of Requirement: Requirement engineering task, process of requirement engineering, information modeling, data flow diagram, decision table, SRS document, SRS validation, components of SRS, characteristics of SRS, ER diagram.

UNIT II

Software reliability and quality Assurance

Verification and validation, Software Quality assurance, capability maturity model, Reliability Issues, Metrics.

System Design

System/Software Design, Architectural Design, Low level design, coupling and cohesion, functional versus Object- Oriented Approach, Design Specification, Verification for design, monitoring and control for design.

Coding

Information Hiding, Programming Style, Internal Documentation, Monitoring and control for coding, Structural Programming.

UNIT III

Software Testing:

Introduction, Testing principles, Testing objectives, Test oracles, Levels of testing, white Box Testing/ Structural Testing, Functional/ Black Box Testing, Test Plan, Test case design, Test characteristics.

UNIT IV

Software Testing Strategies:

Static testing Strategy, Debugging, Error, Fault and failure.

Software Maintenance and Project Management

Software configuration Management activities, change control Process, Software configuration management, Need for maintenance, Categories of maintenance, Maintenance cost.

Reference Books

1. Software Engineering by KK Aggarwal, New Age International
2. Integrated Approach to Software Engineering by PankajJalote
3. An Integrated Approach to Software Engineering by Pressmann, McGraw Hill
4. Software Engineering by lanSommerville, PEARSON

Semester-V Theory: Core paper- 4:

PYTHON PROGRAMMING

UNIT I

Introduction to Python: Features of Python, Flavors of python, Python Virtual machine, Memory management, Garbage Collection, Comparison between Python and C, Java and Python. Installing Python for windows, Writing and executing Python program. Datatypes & Operators in Python: Writing comments, docstrings, Built in data types –None type, numeric type, sequences ,sets and mappings. Literals, Determining data types of variable, naming conventions in Python, Operators: Arithmetic, Assignment, relational, logical, Boolean, Bitwise, membership & Identity Operators. Using Python interpreter as Calculator Mathematical functions. Input & Output: Input/output Statements, Command line arguments. Control Statements – if, if..else, if..elif, while loop , for loop , else suite, break , continue ,assert , return Statements.

Arrays in Python- Creating arrays, Importing array module, Indexing and slicing on arrays, Processing the arrays, types of arrays, working with arrays using numpy. Creating array using linspace() , logspace() , arrange() , zeros() and ones() functions. Mathematical operations on arrays, Comparing arrays, Aliasing, viewing and copying arrays. Dimensions and attributes of Array. Working with multidimensional arrays, indexing and slicing, matrices in numpy.

UNIT II

Strings and characters-Creating, indexing, slicing, repeating, concatenating & comparing strings. Finding and counting substrings in string, Replacing, splitting and joining strings, Working with characters.

Functions – Functions and methods, Defining, calling functions, returning multiple values, formal and actual parameters, Keyword argument Default arguments and variable argument. , Local and Global variables , Anonymous functions and Lambdas, Lists and Tuples : Creating , updating ,concatenating lists ,Repetition of list ,Aliasing and cloning lists, Sorting lists , Nested lists, Tuples ,Creating and accessing tuple elements, Basic operations on tuples ,Functions to process tuples , Nesting ,inserting ,modifying and deleting tuple elements. Dictionaries: Operations on Dictionaries, Dictionary methods, Sorting elements of dictionary, Converting list and strings into Dictionary.

UNIT III

Classes and Objects-Defining class & Objects, constructors, type of methods and variables , Inner classes.

Inheritance and Polymorphism : Type of Inheritance , super() method , method overloading & Overriding, Abstract classes and interfaces. Exception Handling –Type of exceptions, assert Statement, Except Block, User defined exceptions, logging the exceptions

UNIT IV

Graphical User Interface: Root window, font& colors, Canvas and frames. Widgets: Button, Label, Message, Text, Scrollbar, Chekcbutton, Radiobutton, Entry, Spinbox, Listbox and Menu, Creating Tables. Database Connectivity: Types of databases used with Python, Using MySQL from Python, Retrieving and Inserting , updating and deleting data in a table, Creating Database tables through Python.

Reference Books:

1. Ch Satynarayana, M Radhika Mani, ands B N Jagadeesh, Python Programming, Universities Press,2018.
2. Python The Complete Reference by Martin C. Brown ,McGraw Hill Education
3. Complete Introduction to Python Language By Mark Summerfield , Second Edition.
4. Dr. R. Nageshwara Rao , Core Python Programming , Dreamtech Press , Second Addition

Semester-V Skill Component Practical – 1 **J2EE LAB**

PART-A (Simple JSP /Servlet Programs)

1. 1 Write a Java Server Page program to design a student's application form and post the data to the next page and display it.

i. First Name - (Text Box)
ii. Last Name (Text Box)
iii. Date of birth Combo Box
iv. Address (Text area)
v. Gender (Radio buttons)
vi. Course Opted (Combo box – BA, BCom, BSW,)
vii. School Studied (Text Box)
viii. Percentage Obtained :(text Box) numbers only
ix. Hobbies – Check Boxes

2. Write a JSP program to validate the Login Form. If the username and password are matching then forward the control to the Welcome page or to the Error Page. Use same header format for all the pages.

3. Write a JSP Program to design a shopping cart to add items, remove item and to display items from the cart using Sessions
4. Write a Servlet Program to read the System Time and greet the User and change the background colour according to the users option
5. Write a Servlet Program to Design a Shopping Page and to display the data
6. Write a Servlet Program to create a session and display session details
7. Write a Servlet Program to find the new user and the Repeated User of the web site using Cookies

PART B (JSP/Servelet Programs(with Datatbase Connection)

8. Write a JSP Program to implement an Online Examination

9. Create a JSP page that Displays student list from student table. It should display all the student names in a table and the names should be hyperlinks. If you click on a student name, the respective student details should be displayed.

10. Write a Servlet Program to perform Insert Delete and View operations on Employee Table

11. Write a program to authenticate the Login Form

PART C (JDBC Program)

12. Write a JDBC program to perform the following operations on a Book table of Library database(Book_Id, Book_Title, Book_Author, Publication, Book_Price, Book_Copies)

MENU

1. Add a New Book
2. Delete a Specifies Book
3. Update the Book Info

a. Book Price
b. No of Copies

4. Exit

13. Write a JDBC Program to perform the following Operations on Bank Database

Customer data base with following fields- Acc_No, Cust_Name, Cust_Address, Acc_Type, Balance.

Transaction data base with following fields:(Acc_No, Trans_Date, Trans_Type, Particulars, Trans_Amt.

MENU

1. Deposit
2. Withdraw
3. Report

a. Daily Report
b. Periodical Report for a specified Customer

4.Exit

Hints:

- Assume that Customer table contains the date already
- *Validate the Account number for each transaction
- *For each transaction a new record should be inserted into the transaction table and Amount (total amount) should be updated in the Customer table.

14. Write a JDBC program to perform the following operations on the student table.

Student database-(StRegNo, StName, Stdob, StAddress, StClass, StCourse)

MENU

1. Add new Student

2. Delete a specified students Record
3. Update Students Address
4. Search f or a particular Student
5. Exit

15. Write a JDBC Program to Read Marks and calculate the Result. Save the information into the table and display the Result using Join (Student) table.

Examination- RegNo, Subject1, Subject2, Subejct3, Total, Percentage, Result

16. Write a menu driven JDBC program to perform the following operations on the Employee table(EmpId, EmpName, EmpDept, EmpSalary)

MENU
1. Add a new Employee
2. Delete a specified Employee
3. View
a. Display the count of employee and total salary for each department.
4. Update all the employee's salary by a specified amount

17. Refer the above Employee table. Calculate the DA, HRA, PF, Net Salary and Gross Salary for all the employees. Create a new table called Salary and save all the data into it. Display a specified Employees Salary Slip. (Use Join Tables)

Semester-V Skill Component Practical – 2 **Python Programming Lab**

- Find the largest and smallest numbers in a list.
- Find the third largest number in a list.
- Test for primarily.
- Find whether a string is a palindrome or not.
- Given two integers x and n, compute xn.
- Compute the greatest common divisor and the least common multiple of two integers.
- Test if a number is equal to the sum of the cubes of its digits. Find the smallest and largest such numbers

Semester-VI Theory: Core paper- 1:

LINUX AND SHELL PROGRAMMING

UNIT I

An introduction to Linux:
History of Linux, About operating system., Free and open source software, Linux kernel, Linux features, Linux distributions, Linux opportunities, Advantages of Linux , Role of Linux operating system

Linux Distributions and installation:
Introduction, About Linux distributions, RPM based distributions, Deb based distributions.

Installing Linux:
Preparing for installation, Hardware requirements, Booting from CD/DVD, Selecting the installation languages, Selecting region and time zone, Selecting keyboard layout, Preparing disk space, Partitioning hard disk, Selecting installation options, Booting from hard disk

UNIT II

The utilities: Basic utilities, Working with files , communication between processes, Four more utilities , Compressing and archiving files, Locating utilities, Displaying user and system information, Communication with other users.

The file System: the hierarchical file system, directory and ordinary files, pathnames, working with directory, access permissions, links

UNIT III

The Shell: The command line, standard input and standard output, running command in background, filename generation and pathname expansion , Regular Expressions (refer page Number 1011 from book No 2)

The Vim editor: Introduction, Introduction to vim features, Command mode, Input mode, Searching and substituting, Copying, moving and deleting text, Reading and writing files, setting parameters, advanced editing techniques.

UNIT IV

Programming the Bourne again shell:

Background, Redirecting standard error, Writing and executing simple shell script, Control operators, Parameters and variables, Special characters, Processes, aliases, Control structures, File descriptors, Parameters, Variables, Bulletin commands: type, read exec, Expressions, Shell programs.

Reference books:

1. K.L.James, Linux: Learning the essentials , PHI learning private limited, 2011
2. A Practical guide to linux commands, editors, and shell programming by Mark G Sobell.
3. The linux Kernel book by remy card, cric Dumas, frank mevel
4. Parker tim, linux: system administrators survival guide.
5. Your UNIX/Linux: The Ultimate Guide, 3rd edition by Sumithabha das

Semester-VI Theory: Core paper- 2:

CLOUD COMPUTING

UNIT I

Defining Cloud Computing - Defining Cloud Computing, Cloud types: The NIST model, The cloud Cube Model, Deployment Models, Service Models, Examining the Characteristics of Cloud Computing: Paradigm shift, Benefits of cloud computing; Assessing the Role of Open standards.
Understanding Cloud Architecture – Exploring the cloud computing stack: composability, infrastructure, platforms, virtual appliances, communication protocols, applications, connecting to the cloud.

UNIT II

Understanding Services and Applications by Type - Defining Infrastructure as a Service (IaaS) : Iaas Workloads, Pods, Aggregation and silos, Defining Platform as a Service(Paas),Defining Software as a Service(SaaS): SaaS characteristics, Open Saas and SOA,Salesforce.com and CRM SaaS, Defining Identify as a Service(IDaaS): What is an identity, Networked identity service classes, Identity system codes of conduct, IDaas Interoperability: User authentication, Authorization markup languages, Defining Compliance as a Service(CaaS),
Understanding Abstraction and Virtualization - Using Virtualization Technologies, Load Balancing and Virtualization: Advanced load Balancing, The Google cloud, Understanding Hypervisors: Virtual machine types, VMware vSphere, Understanding Machine Imaging, Porting Applications: The Simple Cloud API, AppZero Virtual Application Appliance.

UNIT III

Managing the Cloud – Administrating the clouds: Management responsibilities, Lifecycle management, Cloud management Products, Emerging Cloud Management Standards: DMTF cloud management standards, Cloud Commons and SMI,
Understanding Cloud Security - Securing the cloud: The security boundary, Security service boundary, Security mapping, Security Data: Brokered cloud storage access, Storage location and tenancy, Encryption, Adding and compliance, Establishing Identity and Presence: Identity Protocol standards, Windows Azure identity standards, presence.

UNIT IV

Working with Cloud-based Storage – Measuring the digital universe, cloud storage definition, provisioning cloud storage, managed and unmanaged cloud storage, creating cloud storage systems, virtual storage containers, exploring cloud backup solutions: types, cloud backup features, cloud attached backup; cloud storage interoperability, CDMI, OCCI
Moving Applications to the Cloud – Applications in the Clouds, Functionality mapping, Application attributes, cloud service attributes, system abstraction, cloud bursting, applications and cloud APIs.
Communicating with the Cloud – Exploring Instant Messaging, Instant messaging clients, Instant messaging interoperability, Micro-blogs or Short Message Services.

Reference Books:

1. A T. Velte, Toby J Velte, " Cloud Computing A Practical Approach", Tata McGrawHill
2. Barrie Sosinsky, "Cloud Computing Bible", Wiley India

Semester-VI Theory: Core paper- 3:

ANDROID APPLICATION DEVELOPMENT

UNIT-I

Android Introduction, Smartphones future, Preparing the Environment, Installing the SDK, Creating Android Emulator, Installing and Using Eclipse, Installing Android Development Tools, Choosing which Android version to use
Android Architecture, Android Stack, Android applications structure
Creating a project, Working with the AndroidManifest.xml, Using the log system Activities
Introduction to UI – Layouts, Fragments, Adapters, Action bar, Dialogs, Notifications , UI best practices
UI Architecture, Application context, Intents, Activity life cycle, Supporting multiple screen sizes

Unit - II

Designing User Interface Using Views – Basic Views- TextView, Button, Image Button, Check Box, Toggle Button, Radio Button etc., Progress Bar View and Auto Complete Text View, Time Picker and Date Picker View, List View,
Image View, Image Switcher and Grid View, Digital Clock & Analog Clock Views
Notification and Toast, Parameters , on Intents, Pending intents, Status bar notifications
Toast notifications

UNIT-III

Menus, Localization, Options menu, Context menu
Dialogs-Alert dialog, Custom dialog, Dialog as Activity
Orientation and Movement- Pitch, roll and yaw, Natural device orientation, Reference frame remapping
SMS - Sending and Receiving
Working with Media –Playing audio and video, Recording audio and video

UNIT-IV

Location and Maps - Google maps, Using GPS to find current location
Working with data storage - Shared preferences, Preferences activity, Files access, Using External storage, SQLite database
Animation-View animation, Drawable animation
Working with Sensors- Finding sensors, Accelerometers, Gyroscopes, Other types
Working with Camera – Controlling the camera, Preview and overlays, Taking pictures

Reference Books:

1. Learning Android, Ramesh Bangia, Khanna Publishing House
2. Android application development for java programmers. By James C. Sheusi. Publisher: Cengage Learning, 2013.

ONLINE READING / SUPPORTING MATERIAL:

1. http://www.developer.android.com
2. http://developer.android.com/about/versions/index.html
3. http://developer.android.com/training/basics/firstapp/index.html
4. http://docs.oracle.com/javase/tutorial/index.htm
   (Available in the form of free downloadable ebooks also).
5. http://developer.android.com/guide/components/activities.html
6. http://developer.android.com/guide/components/fundamentals.html
7. http://developer.android.com/guide/components/intents-filters.html.

8. http://developer.android.com/training/multiscreen/screensizes.html
9. http://developer.android.com/guide/topics/ui/controls.html
10. http://developer.android.com/guide/topics/ui/declaring-layout.html
11. http://developer.android.com/training/basics/data-storage/databases.html

Semester-VI Theory: Core paper- 4:

INTERNET OF THINGS TECHNOLOGY

UNIT-I

What is IoT, Genesis of IoT, IoT and Digitization, IoT Impact, Convergence of IT and IoT, IoT Challenges, IoT Network Architecture and Design, Drivers Behind New Network Architectures, Comparing IoT Architectures, A Simplified IoT Architecture, The Core IoT Functional Stack, IoT Data Management and Compute Stack.

UNIT-II

Smart Objects: The "Things" in IoT, Sensors, Actuators, and Smart Objects, Sensor Networks, Connecting Smart Objects, Communications Criteria, IoT Access Technologies.
IP as the IoT Network Layer, The Business Case for IP, The need for Optimization, Optimizing IP for IoT, Profiles and Compliances, Application Protocols for IoT, The Transport Layer, IoT Application Transport Methods.

UNIT-III

Data and Analytics for IoT, An Introduction to Data Analytics for IoT, Machine Learning, Big Data Analytics Tools and Technology, Edge Streaming Analytics, Network Analytics, Securing IoT, A Brief History of OT Security, Common Challenges in OT Security, How IT and OT Security Practices and Systems Vary, Formal Risk Analysis Structures: OCTAVE and FAIR, The Phased Application of Security in an Operational Environment

UNIT-IV

IoT Physical Devices and Endpoints - Arduino UNO: Introduction to Arduino, Arduino UNO, Installing the Software, Fundamentals of Arduino Programming. IoT Physical Devices and Endpoints - RaspberryPi: Introduction to RaspberryPi, About the RaspberryPi Board: Hardware Layout, Operating Systems on RaspberryPi, Configuring RaspberryPi, Programming RaspberryPi with Python, Wireless Temperature Monitoring System Using Pi, DS18B20 Temperature Sensor, Connecting Raspberry Pi via SSH, Accessing Temperature from DS18B20 sensors, Remote access to RaspberryPi, Smart and Connected Cities, An IoT Strategy for Smarter Cities, Smart City IoT Architecture, Smart City Security Architecture, Smart City Use-Case Examples.

Semester-VI Skill Component Practical – 1 Shell Programming And Wireframes Lab

PART A

1. Write a shell program to accept an integer, find its reverse and the sum of its individual digits, also check if the number is palindrome or not.
2. Write a shell program to find the sum of the series 1!+2!+3!+…. n!
3. Write a shell program to display the prime numbers between two given limits.
4. Write a shell program to find the largest among the sety of integers.
5. Write a shell program to accept a word, check whether it begins with a lower case or upper case vowel, ends with a digit or whether it's a 3 letter word.
6. Write a shell program to perform arithmetic calculations using case statement.
7. Write a shell program to accept n integers and count the number of positive integers, negative integers and zeroes. Also find the sum of the positive and negative numbers.
8. Write a shell program to accept many characters and count individual vowels, digits, spaces, special characters and constants.
9. Write a shell program to accept a student's name and marks in three subjects through command line arguments and find the total marks and grade.

PART B

1. Write a menu driven program for the following:
    - Renaming a file.
    - Displaying the current working directory.
    - List the users logged in
    - Append the contents of a file to another file.
2. Program to accept your option for deleting (-d) through command line do the following:
    - Check wether the given arguments are sufficient for the selected option.
    - Deleting file must be present in the current folder.
3. Program to accept many fikles through command line do the following ;
    - If it's ordinary file display the contents of the file.

- If it's a directory, count the contents of a file.
- File/Directory does not exist, display the proper message has execute permission
- It's a directory, display the number of files in it
- The file/dir does not exist, display the proper message.

4. Write a menu driven program to
    - List the directory having all the permissions
    - List the ordinary file with assigned permissions
    - Assign execute permission to specified file for the owner or Group.
    - Exit
5. Write a shell program by providing menu options such as
    - Displaying current date and time
    - Listing files in current directory
    - Showing calendar of this month
    - Show editor
    - Displaying who and all logged into the system.

PART C

WIREFRAMES PRACTICALS

Semester-VI Skill Component Practical – 2 Android Application DevelopmentLab:

1. Create "Hello World" application. That will display "Hello World" in the middle of the screen in the emulator. Also display "Hello World" in the middle of the screen in the Android Phone.
2. Create an application with login module. (Check username and password).
3. Create spinner with strings taken from resource folder (res >> value folder) and on changing the spinner value, Image will change.
4. Create a menu with 5 options and and selected option should appear in text box.
5. Create a list of all courses in your college and on selecting a particular course teacher-incharge of that course should appear at the bottom of the screen.
6. Create an application with three option buttons, on selecting a button colour of the screen will change.
7. Create and Login application as above. On successful login, pop up the message.

8. Create an application to Create, Insert, update, Delete and retrieve operation on the database.

9. Write a simple Application that makes use of Style & Themes.
10. Write a simple Application that uses Event Handling.
11. Write a simple Application that uses Alarm, Notification.
12. Make a location based app.
13. Write a program that shows the use animation.
14. Write a program that shows the use of Image Effects.
15. Write a program that shows the use Image Switcher.
16. Write a program that shows the use of database.

Skill Component: PROJECT DISSERTATION

Guidelines of activities Semester Projects

1. The project in each semester will be different.
2. It is left to the individual to decide whether to carry out the projects in-house in their colleges or outside in reputed industrial establishments approved by the college. **NOTE:***Consultancies not allowed.*
3. The team should submit a synopsis to the college before starting the project.
4. Last date for submission of the project report to the college is Third week of semister.
5. Since the industries treat the software developed under their guidance as absolutely their property, it was decided not to include the software source code for project report or project evaluation.
6. The distribution of marks for the project are as follows:
    - Internal Marks 30
    - Dissertation 60
    - Viva 30
    - Presentation 30
    - **Total** **150**
7. It was decided to have a presentation by each member of the team followed by Viva for about 40 minutes while evaluating the project finally.
8. The composition of the evaluation team will be decided by the BOE.
9. The Project Report should include chapters on the following:

- Project Synopsis
- System Requirements and Specifications
- System Design (Functional Design)
- Database Design (or Data Structures if no database used in the Software)
- Detailed Design (Logic Design of modules)
- User Interface (Screens and Reports)
- Test cases if any

10. For projects carried out in industries, a certificate (to be included in the project report) from the industry indicating that the student has completed the project successfully is enough for the purpose of maintaining the attendance during the project activities.
11. For projects carried out in the college, the attendance may be maintained in the normal manner as in other semesters and a certificate about the same should be included in the project report.
12. The project report documentation should contain 80-120 pages for analysis, design and testing phases. However the size of complete report may vary depending upon the size of coding or implementation and appendices.
13. The project report should normally be printed on A4 paper (one side only).
14. All pages, tables and figures must be numbered and figures should have titles.
15. **It is estimated that the project guide will be required to spend a minimum of 6 hours per week for each of the student while guiding the projects.**

SEMESTERS	SUBJECTS	SKILL OUTCOME
Semester 1	Programming in C Information Technology Tools Internship & Project	• **Solve mathematical or scientific problems using C.** • **Creating knowledge of Computers and Technology.** • **Understand and practice the computer programming.**
Semester 2	Web Designing Relational Database Management System Internship & Project	• **Knowledge of Animation history** • **Creating 2D character and background designs** • **Creating 3D Models, Interiors & Exterior models**
Semester 3	Java Programming Web Programming using PHP Internship & Project	• **Understand and Practice web development** • **Get hands on interactive web, JavaScript and CSS** • **Develop and design web application having images and animations**
Semester 4	Data Structures using C Computer Network Security Internship & Project	• **Practical Skills: Design, build and develop programs of varying levels of complexity.** • **Ability to define the computer science problems.** • **Ability to drive different solution alternatives for the computer science problems.**
Semester 5	Java 2 Enterprise Edition Computer Graphics & Multimedia Software Engineering Python Programming Project	• **Learn various Evaluation methods in Software Development** • **Learn distributed enterprise applications using java.** • **Develop standard software engineering process and strategies in software project development using open source**

		programming environment to deliver a quality product for business success.
Semester 6	Linux and Shell Programming Cloud computing Android Application Development Internet of Things Technology Project	• **Learn the basic concepts and functions of operating system Understand processes and its life cycle.** • **Develop industry standard applications with real life implications.** • **Develop mobile web and applications that runs on multiple platforms.**