B.Sc. VI Semester

Course Code: CSDSC7T	Course Title: Web Technologies
Course Credits: 04	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 02 Hours

Course Outcomes (COs):

At the end of the course, students will be able to:

- Understand basics of web technology.
- Recognize the different Client-side Technologies and tools like, HTML, CSS, JavaScript.
- Learn Java Servlets and JDBC.
- Web Technology for Mobiles and Understand web security

Unit	Description	Hours
1	**Introduction and Web Design:** Introduction to Internet, WWW and Web 2.0, Web browsers, Web protocols and Web servers, Web Design Principles and Web site structure, client-server technologies, Client side tools and technologies, Server side Scripting, URL, MIME, search engine, web server-Apache, IIS, proxy server, HTTP protocol. Introductions to HTML. HTML5 Basics tags, Formatting tags in HTML, HTML5 Page layout and Navigation concepts, Semantic Elements in HTML, List, type of list tags, tables and form tags in HTML, multimedia basics, images, iframe, map tag, embedding audio and video clips on webpage.	10
2	**Introduction to XML:** XML Syntax, XML Tree, Elements, Attributes, Namespace, Parser, XSLT DOM, DTD, Schema. Introduction to CSS, CSS syntax, CSS selectors, CSSBackground Cursor, CSS text fonts, CSS-List Tables, CSS Box Modeling, Display Positioning, Floats, CSS Gradients, Shadows, 2D and 3 Transform, Transitions, CSS Animations.	10
3	**Introduction to JavaScript:** JavaScript Data type and Variables, JavaScript Operators, Conditional Statements, Looping Statements, JavaScript Functions, Number, Strings, Arrays, Objects in JavaScript, Window and Frame objects, Event Handling in JavaScript, Exception Handling, Form Object and DOM, JSON, Browser Object Model.	10
4	**Introduction to Servlets:** Common Gateway Interface (CGI), Lifecycle of a Servlets, deploying a Servlets, The Servlets API, Reading Servlets parameters, reading initialization parameters, Handling HTTP Request &Responses, Using Cookies and sessions, connectingto a database using JDBC.	10

5	**Web Security:** Authentication Techniques, Design Flaws in Authentication, Implementation Flaws in Authentication, Securing Authentication, Path Traversal Attacks. Injecting into Interpreted Contexts, SQL Injection, NoSQL Injection, XPath Injection, LDAP Injection, XML Injection, HTTP Injection, Mail Service Injection. Types of XSS, XSS in Real World, Finding and Exploiting XSS Vulnerabilities, Preventing XSS Attacks.	12

References:

1. Web Programming, building internet applications, Chris Bates 2nd edition, WileyDremtech .
2. Java Server Pages – Hans Bergsten, SPD O'Reilly.
3. Java Script, D.Flanagan, O'Reilly, SPD.
4. Beginning Web Programming-Jon Duckett WROX.
5. Web Applications : Concepts and Real World Design, Knuckles, Wiley-India.
6. Internet and World Wide Web – How to program, Dietel and Nieto, Pearson.

Course Code: CSDSC7P	Course Title: Web Technologies Lab
Course Credits: 02	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks: 25	Exam Duration: 02 Hours

Practicals:

Part A

1. Design web pages for your college containing college name and logo,departments list using , list tags.
2. Create a class timetable using table tag.
3. Write a HTML code to design Student registrations form for your college Admission.
4. Design Web Pages with includes Multi-Media data (Image, Audio, Video, GIFs etc)
5. Create a web page using frame.
6. Write code in HTML to develop a webpage having two frames that divide the webpage intotwo equal rows and then divide the row into equal columnsfill each frame with a different background color.
7. Write CSS code to Use Inline CSS to format your ID Card.
8. Using HTML, CSS create display a text called -Hello India !! on top of an image of India- Map using an overlay.

Part B

1. Write a JavaScript Program to perform Basic Arithmetic operations.
2. JavaScript Program to Check Prime Number.
3. JavaScript Program to implement Javascript Object Concept.
4. JavaScript Program to Create Array and inserting Data into Array.
5. JavaScript Program to Validate an Email Address.
6. Write a Program for printing System Date & Time using SERVLET.
7. Write a server side SERVLET program for accept number from HTML file and Display.
8. Write a program to Creating the Life-Cycle Servlet Application.

Course Code: CSDSC8T	Course Title: Statistical Computing & R Programming
Course Credits: 04	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 02 Hours

Course Outcomes (COs):

At the end of the course, students will be able to:

- Explore fundamentals of statistical analysis in R environment.
- Describe key terminologies, concepts and techniques employed in StatisticalAnalysis.
- Define Calculate, Implement Probability and Probability Distributions to solve awide variety of Problems.
- Conduct and interpret a variety of Hypothesis Tests to aid Decision Making.
- Understand, Analyze, and Interpret Correlation Probability and Regressionto analyze the
- Underlying relationships between different variables.

Unit	Description	Hours
1	Introduction of the language, numeric, arithmetic, assignment, and vectors, Matrices and Arrays, Non-numeric Values, Lists and Data Frames, Special Values, Classes, and Coercion, Basic Plotting.	10
2	Reading and writing files, Programming, Calling Functions, Conditions and Loops: stand- alone statement with illustrations in exercise 10.1,stacking statements, coding loops, Writing Functions, Exceptions, Timings, and Visibility.	10
3	Statistics And Probability, basic data visualization, probability, common probability distributions: common probability mass functions, bernoulli, binomial, poisson distributions, common probability density functions, uniform, normal, student's t-distribution.	10
4	Statistical testing and modelling, sampling distributions, hypothesis testing, components of hypothesis test, testing means, testing proportions, testing categorical variables, errors and power, Analysis of variance.	10
5	Simple linear regression, multiple linear regression, linear model selection and diagnostics. Advanced graphics: plot customization, plotting regions and margins, point and click coordinate interaction, customizing traditional R plots, specialized text and label notation. Defining colors and plotting in higher dimensions, representing and using color, 3D scatter lots.	12

References:

1. Tilman M. Davies, -The book of R: A first course in programming and ststisticsl, San Francisco, 2016.
2. Vishwas R. Pawgi, —Statistical computing using R softwarel, Nirali prakashan publisher, el edition, 2022.
   https://www.youtube.com/watch?v=KlsYCECWEWE
3. https://www.geeksforgeeks.org/r-tutorial/
   https://www.tutorialspoint.com/r/index.html

Course Code: CSDSC8P	Course Title: R Programming Lab
Course Credits: 02	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks: 25	Exam Duration: 02 Hours

Practicals:

Part -A

1. Write a R program for different types of data structures in R.
2. Write a R program that include variables, constants, data types.
3. Write a R program that include different operators, control structures, default values for arguments, returning complex objects.
4. Write a R program for quick sort implementation, binary search tree.
5. Write a R program for calculating cumulative sums, and productsminima maxima and calculus.
6. Write a R program for finding stationary distribution of markanov chains.
7. Write a R program that include linear algebra operations on vectors and matrices.
8. Write a R program for any visual representation of an object with creating graphs using graphic functions: Plot( ), Hist( ), Line chart( ), Pie( ), Box plot( ), Scatter plots( ).
9. Write a R program for with any dataset containing data frame objects, indexingand sub setting data frames, and employ manipulating and analyzing data.
10. Write a program to create any application of Linear Regression in multivariate context for predictive purpose.
11. Write a R program to take input from the user (name and age) and display the values. Also print the version of R installation.

Part –B

1. Write a R program to get the details of the objects in memory.

2. Write a R program to create a sequence of numbers from 20 to 50 and find the mean of numbers from 20 to 60 and sum of numbers from 51 to 91.

3. Write a R program to create a vector which contains 10 random integer values between -50 and +50.

4. Write a R program to get the first 10 Fibonacci numbers.

5. Write a R program to get all prime numbers up to a given number

    (based on the sieve of Eratosthenes).

6. Write a R program to print the numbers from 1 to 100 and print "Fizz" for multiples of 3,

    print "Buzz" for multiples of 5, and print "Fizz Buzz" for multiples of both.

7. Write a R program to extract first 10 English letter in lower case and last 10 letters in upper case and extract letters between 22nd to 24th letters in upper case.

8. Write a R program to find the factors of a given number.

9. Write a R program to find the maximum and the minimum value of a given vector.

10. Write a R program to get the unique elements of a given string and unique numbers of vector.

11. Write a R program to create three vectors a,b,c with 3 integers. Combine the three vectors to become a 3×3 matrix where each column represents a vector. Print the content of the matrix.

INTERNSHIP/ PROJECT

Course Code: CSINT	Course Title: Internship/Project
Course Credits: 02	Formative Assessment Marks:50

Course Outcomes (COs): At the end of the course, students will be able to:

- The student will be able to analyze, specify, design, implement and test application software.
- Allows a student to demonstrate their capabilities while working independently.
- Design a project through technical knowledge to meet customer/End user needs.
- Acquire a deeper understanding of software industry trends, best practices, and current
- Developments.
- Apply process of Project Development to analyze and design the real-world problem.
- Document the project report of various phases for future scope of the project development.

Execution of the Project:

1. The individual student is required to carry out the project under the guidance of course teacher.
2. Project work problem statement shall be identified by the students with the help of the course teachers and students shall submit the synopsis/project proposal of the same.
3. During project development students are expected to define a project problem, do requirements analysis, systems design, software development, apply testing strategies and do documentation with an overall emphasis on the development of a robust, efficient and reliable software systems.
4. The project development process has to be consistent and should follow standards identified by the guide monitoring the project work.
5. There is no restriction on use of hardware's and software's for carrying out the project work .except that ready application packages are not allowed.
6. The students have to submit two hard copies of Dissertation along with CD , after completion of the project work.

Note:

1. Internship shall be Discipline Specific of 90 hours (2 credits) with duration 4-6 weeks.
2. Internship mentor/supervisor shall avail work allotment during 6th semester for a maximum of 20 hours.
3. The student should submit the final internship report
4. Method of evaluation: Presentations/Report submission/Activity/Viva-Voce etc.
5. The detailed guidelines and formats shall be formulated by the university separately.

Whenever Internship is not feasible, the students can to choose the Project Work.

Formative Assessment format for DSC/DSE/OE

Formative Assessment for Theory

Component-1	a) Internal Assessment Test	15
	b)Seminar/Presentation/Activity	05
Component-2	a) Internal Assessment Test	15
	b)Case study/Assignments/Quiz	05
	Total	**40**

Formative Assessment for Practical

Component-1	a) Internal Assessment Test	20
	b)Case study/Assignments/Quiz	05
	Total	**25**

Evaluation Scheme for Practical Examination

Assessment Criteria		Marks
Program – 1 from Part A	Flowchart / Algorithm	03
	Writing the Program	05
Program -2 from Part B	Flowchart/Algorithm	03
	Writing the Program	05
Execute any one program of Examiner choice		06
	Viva Voce	03
	Total	**25**

Theory Question Paper Pattern for B.Sc /BCA
(For DCC/DSE/OE)

Section-A			
Answer any Five of the following Questions			**5x2=10**
Q1	a	Question to be asked from Unit-I	
	b	Question to be asked from Unit-I	
	c	Question to be asked from Unit-II	
	d	Question to be asked from Unit-II	
	e	Question to be asked from Unit-III	
	f	Question to be asked from Unit-IV	
	g	Question to be asked from Unit-V	
Section-B			
Answer any Four of the following Questions			**4x5=20**
2	Question to be asked from Unit-I		
3	Question to be asked from Unit-I		
4	Question to be asked from Unit-II		
5	Question to be asked from Unit-III		
6	Question to be asked from Unit-IV		
7	Question to be asked from Unit-V		
Section-C			
Answer any Three of the following Questions			**3x10=30**
8	Question to be asked from Unit-I		
9	Question to be asked from Unit-II		
10	Question to be asked from Unit-III		
11	Question to be asked from Unit-IV		
12	Question to be asked from Unit-V		

Note : While drawing the Questions, all the units in the syllabus must be given equal weightage.