Structure & Syllabus for Semester-II

BACHELOR OF COMPUTER APPLICATIONS (BCA) Programme

Gujarat University

2023 - 2024

As per NEP 2020 CURRICULUM AND CREDIT FRAMEWORK FOR UNDERGRADUATE PROGRAMMES, UGC

&

Resolution No. KCG/admin/2023-24/0607/kh.1

of

Education Department, Govt. of Gujarat

STRUCTURE FOR SEMESTER - 2
GUJARAT UNIVERSITY
Bachelor Of Computer Applications (B.C.A.)
(as per NEP 2020)

COURSE:	**Bachelor Of Computer Applications (B.C.A.)**
MAJOR:	**COMPUTER APPLICATIONS**
MINOR:	**1. COGNITIVE MATHS**
	2. DATA SECURITY
	3. WEB TECHNOLOGIES

SEMESTER - 2

MAJOR

CODE	COURSE	CREDITS
DSC-C-BCA-121T	Data Structures Using C	4
DSC-C-BCA-122P	Data Structures Using C Practical	4

MINOR

CODE	COURSE	CREDITS
DSC-M-BCA-123T	Statistical Methods	2
DSC-M-BCA-123P	Applications of Statistical Methods	2
	OR	
DSC-M-BCA-123T	Cryptography	2
DSC-M-BCA-123P	Cryptography Using C	2
	OR	
DSC-M-BCA-123T	Advanced Web Technologies	2
DSC-M-BCA-123P	Applications of Dynamic Web Technologies	2

INTER DISCIPLINARY / MULTI DISCIPLINARY

(1 Theory and 1 Practical Course has to be chosen. Courses can be chosen from Basket)

CODE	COURSE	CREDITS
IDC-BCA-124P	Working with Data Using MySQL	2
IDC-BCA-124T	Data Management software for Business	2
IDC-BCA-124P	Business Data Analytics using Spreadsheets	2

ABILITY ENHANCEMENT COURSE ()

AEC-BCA-125	(Any ONE Course to be selected from the Basket)	**2**

SKILL ENHANCEMENT COURSE

(Any ONE Course. Course can also be chosen from Basket)

SEC-BCA-126	Business Enhancement Using WordPress	**2**

COMMON VALUE ADDED COURSES

VAC-BCA-127	(Any ONE Course to be selected from the Basket)	**2**

TOTAL CREDITS 22

Semester – II

BACHELOR OF COMPUTER APPLICATIONS

MAJOR : COMPUTER APPLICATION

Course Name: Data Structures using C

Course Code: DSC-C-BCA-121 T

Credits: 4

Course Outcomes:

The aim of this course is to enable students to

- To comprehend the steps required to solve a problem in order to get the intended result.
- Learn how to properly organize information in the digital environment.
- To figure out the core idea behind simple data structures and how they're implemented.
- To understand where and how the data structures are implemented in real world.
- Discover how to create computer programs that are effective and optimized.

Prerequisites:

- Basic knowledge of writing and understanding algorithms for solving a problem.
- Basic knowledge of C programming.

Contents:

Unit No.	Particulars	Hours	Credits
1.	**Unit Title: Indian Knowledge System** The Creation of the Binary Number System by Pingala The Binary Number system: fundamental principle on which today's digital technology works, Sanskrit prosody (Guru & Laghu): the building block of Binary number system, Concept of Metre with 1 and more syllables, Creation of Binary number system **Ancient Indian Mathematics: Meru Prastaar** Creating a table of numbers: Meru prastaar, creating table for a metre having n syllables, Table revealing the Binomial coefficient nCr. Recurrence Relation (nCr = n-1Cr-1 + n-1Cr): The Basic Rule for construction of Meru Prastaar. Meru Prastaar as today's Pascal Triangle	15	1
2.	**Unit Title: Introduction to Data Structures, Array and Linked List** Concept of Data structures, Classification of Data Structures (Linear and Non-linear data structure). **Array:** Basic concept (Definition) Searching **Algorithms:** Linear (Sequential) Search, Binary Search **Sorting Algorithms:** Bubble sort, Selection sort, Insertion sort **Linked List**: Basic concept, Storage representation, Types of Linked lists (Singly, Doubly, Circular), Operations on Singly and Doubly linked list (Creation,	15	1

	Traversal, **Insertion**: at Beginning, at End, **in between**: after and before, **Deletion:** from beginning, from end, from between, particular node).		
3.	**Unit Title: Linear Data Structures - Stack, Queue** **Stacks:** Basic concept, Storage representation (Array and linked list), Basic Operations (PUSH, POP, PEEP and CHANGE) using array and linked list, Applications of Stacks (Polish and reverse polish expressions), Arithmetic Expression evaluation using stack. **Queues:** Basic concept, Storage representation (Array and Linked list), Types of Queues: Simple, Circular, Double Ended Queue, Priority queues, Basic Operations on Simple Queue (Enqueue and Dequeue using array and linked list) and Circular Queue (Enqueue and Dequeue using array), Application of Queues.	**15**	**1**
4	**Unit Title: Non-Linear Data Structures – Tree, Graph** **Trees** – Basic concept, terms associated with trees (Node, parent, child, link, root, leaf, level, height, in degree, out degree, siblings), Storage representation – Linear and Linked, Types of trees (Binary Tree - Complete Binary tree, full binary tree, Tree traversal algorithms – In order, Pre-order, Post-order, BST (Create, Insertion), Expression tree, AVL Tree (Insertion), B tree, Threaded binary tree), **Graphs**-Basic concepts, technical terms associated with Graphs – Digraph, Weighted graph, adjacent vertices, self-loop, parallel edges, simple graph, complete graph, isolated vertex, Degree of a vertex, connected graph-, Storage representation (Set representation, Adjacency matrix, Adjacency list), Graph Traversing algorithms- DFS and BFS. Concept of Minimum Spanning Tree – Prim's Algorithm, Kruskal's Algorithm, Shortest path algorithm – Dijikstra 's algorithm.	**15**	**1**

Textbook:

1. Data and File structures using C, Publisher: Oxford, By: Reema Thareja

References:

1. Classic Data Structures Second Edition, Publisher: PHI, By: Debasis Samanta
2. An Introduction to Data Structures with Applications 2nd Edition, (2007), Publisher: Tata McGraw-Hill, By: Jean-Paul Tremblay, Paul G. Sorenson
3. Introduction to Data Structures in C (2004), Publisher: Pearson Education, By: Ashok N. Kamthane

Other Web References:

1. https://chandrahasblogs.wordpress.com/2020/04/22/how-pingala-created-the-binary-number-system/
2. https://indica.courses/ancient-indian-mathematics-meru-prastaar/
3. https://www.geekforgeeks.org/data-structure/
4. https://www.tutorialspoint.com/data_structures_algorithms
5. https://www.javatpoint.com/
6. https://www.studytonight.com/data-structures/

Accomplishments of the student after completing the Course:

After completion of this course Student would be able to

- Design and implement various abstract data types.
- Identify the various applications of different data structures in a computer system.
- Understand and implement the various sorting and searching methods on the data sets.

Course Name: Data Structures using C Practical

Course Code: DSC-C-BCA-122 P

Credits: 4

Course Outcomes:

The aim of this course is to enable students to

- To comprehend the steps required to solve a problem in order to get the intended result.
- Learn how to properly organize information in the digital environment.
- To figure out the core idea behind simple data structures and how they're implemented.
- To understand where and how the data structures are implemented in real world.
- Discover how to create computer programs that are effective and optimized.

Prerequisites:

- Basic knowledge of writing and understanding computer programs for solving a problem.
- Basic knowledge of C programming.

Contents:

Unit No.	Particulars	Hours	Credits
1.	**Unit Title: Linked Lists:**	**30**	**1**

Singly Linked List:

1. Write a C program to implement following operations using Singly Linked List
    - Creation
    - Insertion at beginning
    - Insertion at end
    - Insertion in between (Before any node)
    - Insertion in between (After any node)
    - Traversal
    - Delete first node
    - Delete last node
    - Delete in between (Before any node)
    - Delete in between (After any node)
    - Delete particular node
    - Count no. of nodes in the list

Doubly Linked List:

1. Write a C program to implement following operations using Doubly Linked List
    - Creation
    - Insertion at beginning
    - Insertion at end
    - Insertion in between (Before any node)
    - Insertion in between (After any node)
    - Traversal
    - Delete first node
    - Delete last node
    - Delete in between (Before any node)
    - Delete in between (After any node)
    - Delete particular node
    - Count no. of nodes in the list

2.	**Unit Title: Stacks:**	**30**	**1**

1. Write a C program to implement following operations in STACK (using Array)
    - PUSH
    - POP
    - PEEP
    - CHANGE
    - DISPLAY
2. Write a C program to implement following operations in STACK (using Linked Lists)
    - PUSH
    - POP
    - PEEP
    - CHANGE
    - DISPLAY
3. Write a C program to reverse the string using the STACK.
4. Write a C program to implement recursion.
5. Write a C program to implement conversion of infix expression into postfix expression (parentheses and non-parentheses).

3	**Unit Title: Queues and Trees:**	**30**	**1**

Queues:

1. Write a C program to implement following operations in SIMPLE QUEUE (using array)
    - ENQUEUE (Insertion)
    - DEQUEUE (Deletion)
    - DISPLAY

2. Write a C program to implement following operations in SIMPLE QUEUE (using Linked List)
    - ENQUEUE (Insertion)

- DEQUEUE (Deletion)
- DISPLAY

3. Write a C program to implement following operations in CIRCULAR QUEUE (using array)
    - ENQUEUE (Insertion)
    - DEQUEUE (Deletion)
    - DISPLAY

Trees:

1. Write a C program to implement following operations on Binary Search Tree using Linked List.
    - CREATION
    - INSERTION
    - TRAVERSAL (In-Order, Pre-Order, Post-Order)

4	**Unit Title: Sorting and Searching**	**30**	**1**

Sorting:

1. Write a C program to implement Bubble Sort.
2. Write a C program to implement Selection Sort.
3. Write a C program to implement Insertion Sort.

Searching:

1. Write a C program to implement Linear / Sequential Search.
2. Write a C program to implement Binary Search.

Textbook:

1. Data and File structures using C, Publisher: Oxford, By: Reema Thareja

References:

1. Classic Data Structures Second Edition, Publisher: PHI, By: Debasis Samanta
2. An Introduction to Data Structures with Applications 2nd Edition, (2007), Publisher: Tata McGraw-Hill, By: Jean-Paul Tremblay, Paul G. Sorenson
3. Introduction to Data Structures in C (2004), Publisher: Pearson Education, By: Ashok N. Kamthane

Webilography:

1. https://www.geekforgeeks.org/data-structure/
2. https://www.tutorialspoint.com/data_structures_algorithms
3. https://www.javatpoint.com/
4. https://www.studytonight.com/data-structures/

Accomplishments of the student after completing the Course:

After completion of this course Student would be able to

- Design and implement various abstract data types.
- Implement various Data Structure algorithms practically using C Programming Language.

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SEMESTER - 2

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MINOR

CODE	COURSE	CREDITS
DSC-M-BCA-123T	Statistical Methods	2
DSC-M-BCA-123P	Applications of Statistical Methods	2
	OR	
DSC-M-BCA-123T	Cryptography	2
DSC-M-BCA-123P	Cryptography Using C	2
	OR	
DSC-M-BCA-123T	Advanced Web Technologies	2
DSC-M-BCA-123P	Applications of Dynamic Web Technologies	2

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IDC-BCA-124P	Business Data Analytics using Spreadsheets	2

ABILITY ENHANCEMENT COURSE ()

AEC-BCA-125	(Any ONE Course to be selected from the Basket)	**2**

SKILL ENHANCEMENT COURSE
(Any ONE Course. Course can also be chosen from Basket)

SEC-BCA-126	Business Enhancement Using WordPress	**2**

COMMON VALUE ADDED COURSES

VAC-BCA-127	(Any ONE Course to be selected from the Basket)	**2**

TOTAL CREDITS 22

Semester – II

BACHELOR OF COMPUTER

APPLICATIONS MINORS

1. COGNITIVE MATHEMATICS (CG)
2. DATA SECURITY (DS)
3. WEB TECHNOLOGIES (WTECH)

Course Name: Statistical Methods
Course Code: DSC-M-BCA-123 T
Credits: 2
Course Outcomes:
The aim of the course is to enable students to:

1. Make familiar with R which is an advanced language for statistical computations of data and which is used widely by data analyst.
2. As R interprets the data in a graphical form it makes easy to understand the behaviour of the data.

Prerequisites:

Basic knowledge of basic statistics.

Contents:

Unit No.	Particulars	Hours	Credits
1.	**Measure of Central Tendency and Probability** Mean: Arithmetic Mean, Arithmetic Mean of Grouped Frequency Distribution, Short-cut Method and Step-Deviation Method of, Obtaining Arithmetic Mean (Excluding Mathematical Properties of A.M) , Combined Arithmetic Mean, Cumulative Arithmetic Mean, Advantages, disadvantages and uses of Arithmetic Mean, Geometric Mean, G. M, H.M., Relation Among A.M.,G.M.,H.M., Standard Deviation , Coefficient of variance, Alternative Method of Standard Deviation, Advantages and disadvantages of S.D. **Probability and Probability Distribution:** Introduction , Definitions of Some Important Terms, Random Experiment, Trial Event, Favorable Cases, Equally Likely Events, Mutually Exclusive Events, Exhaustive Events, Dependent Events, Independent Events, Statistical approach to probability, Modern approach to probability, Symbols associated with probability, Algebra of sets, Conditional Probability, Theorems (Laws) of Probability(Without Proof), Baye's Rule(only for two events)	15 hrs	01
2.	**Correlation and Regression Analysis:** Introduction, Types of Correlation, Positive, Negative and Zero Correlation, Linear and non-linear Correlation, Simple, Multiple and Partial Correlation , Positive, Negative and Zero Correlation, Methods of Measuring Correlation, Karl Pearson's Product Moment Method, Spearman's Rank Method, Regression Equation., Method of Least Squares., The regression equation of Y on X, The regression equation of X on Y, Regression Coefficient & Its Properties (without proof), Correlation Versus Regression	15 hrs	01

References:

1. Business Statistics (Third Revised Edition)
   Publication: S.Chand
   By Padmalochan Hazarika
2. Business Mathematics and Statistics
   Publication: Tata McGraw Hill Education Private Limited
   By N G Das and J K Das

Course Name: Applications of Statistical Methods

Course Code: DSC-M-BCA-123 P

Credits: 2

Course Outcomes:

The aim of the course is to enable students to:

1. Make familiar with R which is an advanced language for statistical computations of data and which is used widely by data analyst.
2. As R interprets the data in a graphical form it makes easy to understand the behaviour of the data.

Prerequisites:

Basic knowledge of basic statistics.

Content

Unit No.	Particulars	Hours	Credits
1	Introduction to R and R studio: What is R? R Environment. Variables, Operators, Data types, Control Statements. Familiarise with available data sets in R. Basic Packages to statistics.	30 hrs	01
2	Compute Mean, Median, Quartiles, Percentile, Variance, Standard Deviation, IQR, Summary Statistics Generate Frequency Distribution of data as a data frame. Compute Correlation Coefficient and Covariance and linear regression using command in R.	30 hrs	01

References:

1. R for Data science (1st Edition)
   Author: Hadley Wickham, Publisher
   Publication: O'Reilly
2. A course in Statistics With R
   Author: Prabhanjan Narayanachar Tattar, Suresh Ramaiah, B.G. Manjunath,
   Publication: Wiley

Accomplishments of the student after completing the Course:

After completion of this course, students will be able to

1. learn to interpret the data in a graphical form and analyse the data behaviour.
2. handle various complex statistical computations and calculations.

Course Name: Cryptography

Course Code: DSC-M-BCA-123 T

Credits: 2

Course Outcomes:

At the end of the course, the student will be able

- Understand the fundamentals of cryptography
- Analyze cryptographic algorithms: Students should be able to analyze and evaluate the strength.
- Apply cryptographic techniques.
- Identify common cryptographic attacks.

Prerequisites:

Here are some common prerequisites you might expect for a cryptography course:

- Mathematics: A strong foundation in mathematics is essential for cryptography.
- Probability and Statistics: Knowledge of probability and statistics is often required as cryptographic algorithms often involve probabilistic elements.
- Networking: Some courses might assume familiarity with computer networks and network security concepts.

Contents:

Unit No.	Particulars	Hours	Credits
1.	**Introduction to Cryptography and Its Types:** Historical perspective of cryptography, Goals and principles of cryptography Types of cryptographic techniques: symmetric and asymmetric encryption, hashing, digital signatures, etc., Security services: confidentiality, integrity, authenticity, non-repudiation, and availability, Caesar Cipher and its vulnerabilities, Vigenère Cipher and its weaknesses, Playfair Cipher and its analysis, Transposition Ciphers: Rail Fence, Columnar Transposition, etc., Cryptanalysis techniques for classical ciphers, Caesar Cipher and its vulnerabilities, Vigenère Cipher and its weaknesses Playfair Cipher and its analysis, Transposition Ciphers: Rail Fence, Columnar Transposition, etc., Cryptanalysis techniques for classical ciphers, Data Encryption Standard (DES) and its vulnerabilities, Advanced Encryption Standard (AES) and its strength, Block Cipher modes of operation: ECB, CBC, CTR, etc., Stream Ciphers: RC4, ChaCha20, Message Authentication Codes	15	1

(MACs), Introduction to Number Theory: prime numbers, modular arithmetic,
RSA Encryption and RSA Digital Signatures, Diffie-Hellman Key Exchange,
ElGamal Encryption and Digital Signatures
Elliptic Curve Cryptography (ECC)

2.	**Hash Functions and Cryptographic Protocols:** Properties of cryptographic hash functions,MD5 and its vulnerabilities,SHA-1 and SHA-2 family (SHA-256, SHA-512),SHA-3: The Keccak Hash Function, SSL/TLS: Secure Socket Layer/Transport Layer Security, IPsec: Internet Protocol Security, Pretty Good Privacy (PGP) and GNU Privacy Guard (GPG) Digital Certificates and Public Key Infrastructure (PKI), Zero-Knowledge Proofs, Brute-force attacks, Differential and linear cryptanalysis, Birthday attacks, Side-channel attacks	**15**	**1**

References:

1. "Cryptography Engineering: Design Principles and Practical Applications" by Niels Ferguson, Bruce Schneier, and Tadayoshi Kohno.
2. "Applied Cryptography: Protocols, Algorithms, and Source Code in C" by Bruce Schneier.
3. "Introduction to Cryptography with Coding Theory" by Wade Trappe and Lawrence C. Washington.

Accomplishments of the student after completing the Course:

After completion of this course, students will be able to

- Understand Cryptographic Concept
- Understand about Security Awareness
- Get Cyber security Career Opportunities
- Perform Problem-Solving Skills
- Identify common cryptographic attacks.

Course Name: Cryptography Using C

Course Code: DSC-M-BCA-123 P

Credits: 2

Course Outcomes:

At the end of the course, the student will be able

- Understand the fundamentals of cryptography
- Analyze cryptographic algorithms: Students should be able to analyze and evaluate the strength.
- Apply cryptographic techniques

Prerequisites:

Here are some common prerequisites you might expect for a cryptography course:

- Mathematics: A strong foundation in mathematics is essential for cryptography.
- Probability and Statistics: Knowledge of probability and statistics is often required as cryptographic algorithms often involve probabilistic elements.
- Networking: Some courses might assume familiarity with computer networks and network security concepts.
- Programming Skills: Basic programming skills are often required.

Contents:

Unit No.	Particulars	Hours	Credits
1.	**Cryptography Algorithms:** 1. Caesar Cipher: A simple substitution cipher where each letter in the plaintext is shifted by a fixed number of positions down the alphabet. 2. Vigenère Cipher: A more secure polyalphabetic substitution cipher using a keyword to shift the letters in the plaintext. 3. One-Time Pad: An encryption technique using a random key as long as the plaintext, ensuring perfect secrecy. 4. Playfair Cipher: A digraph substitution cipher using a 5x5 matrix of letters. 5. Rail Fence Cipher: A transposition cipher that rearranges the letters in a zigzag pattern. 6. RSA Encryption: A widely-used public-key cryptosystem based on the difficulty of factoring large numbers. 7. Diffie-Hellman Key Exchange: A method to securely exchange cryptographic keys over an insecure channel. 8. AES Encryption: The Advanced Encryption Standard, a widely used symmetric encryption algorithm. 9. DES Encryption: The Data Encryption Standard, an older symmetric encryption algorithm. 10. Triple DES (3DES) Encryption: A variant of DES that applies DES encryption three times.	**30**	**1**

2.	**Cryptography Algorithms:** 1. Blowfish Encryption: A symmetric block cipher designed for fast encryption and decryption. 2. MD5 Hashing: A widely used cryptographic hash function to produce a fixed-size hash value from input data. 3. SHA-1 Hashing: A cryptographic hash function producing a 160-bit hash value. 4. SHA-256 Hashing: A cryptographic hash function producing a 256-bit hash value. 5. HMAC: A method to compute a hash-based message authentication code using a cryptographic hash function. 6. Elliptic Curve Cryptography (ECC): A public-key cryptosystem based on elliptic curves. 7. Digital Signature Algorithm (DSA): A digital signature scheme using public and private keys. 8. Hash-based Message Authentication Code (HMAC): A mechanism that uses cryptographic hash functions to verify data integrity and authenticity. 9. Rivest–Shamir–Adleman (RSA) Digital Signature: A signature scheme based on the RSA algorithm for signing and verifying messages. 10. Secure Hash Algorithm 3 (SHA-3): The latest member of the Secure Hash Algorithm family, providing enhanced security over older SHA versions.	**30**	**1**

References:

1. "Cryptography Engineering: Design Principles and Practical Applications" by Niels Ferguson, Bruce Schneier, and Tadayoshi Kohno.
2. "Applied Cryptography: Protocols, Algorithms, and Source Code in C" by Bruce Schneier.
3. "Introduction to Cryptography with Coding Theory" by Wade Trappe and Lawrence C. Washington.

Accomplishments of the student after completing the Course:

After completion of this course, students will be able to

- Debug and Troubleshoot the Programs.
- Write Secure Code
- Develop Real-World Applications
- Work with Libraries and APIs
- Understand Vulnerabilities

Course Name: Advanced Web Technologies

Course Code: DSC-M-BCA-123 T

Credits: 2

Course Outcomes:

At the end of the course, the student will be able

- To familiar with dynamic web page creation tools like JavaScript, jQuery, JSON, and XML.
- To understand dynamic web page design.
- To be aware of the real functions of website development.
- To develop the skills in the advanced topics of DHTML.
- To learn the fundamentals of JavaScript.
- To understand the use of XML in web site development.

Prerequisites:

Any editor of Windows like Notepad, Notepad++, VS Code
Any Browser

Contents:

Unit No.	Particulars	Hours	Credits
1.	**Unit Title: Introduction to JavaScript and jQuery** JavaScript Introduction: Understanding JavaScript, About Dynamic HTML, Selecting a development environment for JavaScript, HTML and JavaScript, Advanced JavaScript: Elements of JavaScript, Variables, Operators, Flow control statement, Arrays, Functions, Event handling, Browser and JavaScript, Web pages and JavaScript, Frames and JavaScript, Validating User form, jQuery: Introduction, jQuery Primer, Using jQuery: The two jQuery downloads, Including jQuery (Using script), Basic jQuery syntax, Connecting jQuery to the load event, Using Selectors: Selecting elements by ID, Selecting elements by Class, Selecting elements by Type, Selecting elements by Hierarchy, Selecting elements by Attribute, Functions: Traversing the DOM, Changing text and HTML, Inserting Elements, Events: Binding and Unbinding, Mouse Events and Hover.	15	01
2.	**Unit Title: JSON and XML** **JSON**: Introduction of JSON, Why we use JSON?, Where we can use JSON?, JSON Characteristics, JSON Advantages and Disadvantages, Difference Between JSON and XML, JSON Data Types, JSON Syntax, Trilling Comma and comma problems, JSON Object, JSON Array, JSON Parse: Parse String data in to JSON Object. **XML**: Introduction, XML versus HTML, XML terminologies, XML standards (XML namespace, DTD, CSS, XSL, XML schema), XML	15	01

Documentation: Introduction to DTD, Document type declaration, Element type declaration, Attribute declaration, limitations of DTD

Textbook/s:

1. Deven N. Shah, Kogent Learning Solutions Inc., "*A Complete Guide to Internet and Web Programming*", DREAMTECH PRESS
2. Steve Suehring, "*JavaScript Step by Step*", 2nd Edition, Microsoft Press US
3. Atul Kahate, "*XML and Related Technologies*", 1st Edition, Pearson Education

References:

1. Tom Marrs, "*JSON at Work*", 1st Edition, O'Reilly Media
2. Kogent Learning Solutions Inc., "*HTML 5 in SIMPLE STEPS*", DREAMTECH PRESS
3. Dane Cameron, "*HTML5, JavaScript, and jQuery 24-Hour Trainer*", 1st Edition, Wrox
4. Ivan Bayross, "*Web Enabled commercial application development using HTML, Javascript, DHTML and php*", BPB Publication.
5. Gosselin, "*Java Script Indian Edition*", 1st Edition, CENGAGE Learning
6. Kevin Howard Goldberg, "*Visual Quick Start XML*", 2nd Edition, Pearson Education
7. Michael Morrison, "*Sams Teach Yourself XML in 24 hours",* 1st Edition, PEARSON Education

E-Resources:

1. https://www.w3schools.com/js/
2. https://www.w3schools.com/jquery/
3. https://www.w3schools.com/js/js_json_intro.asp
4. https://www.tutorialspoint.com/javascript/index.htm
5. https://www.tutorialspoint.com/jquery/index.htm
6. https://www.tutorialspoint.com/json/index.htm
7. https://www.json.org/json-en.html

Accomplishments of the student after completing the Course:

After completion of this course, students will be able to

- Develop a webpage or website.
- Use various JavaScript frameworks for developing and building web and mobile apps.

Course Name: Applications of Dynamic Web

Technologies Course Code: DSC-M-BCA-123 P

Credits: 2

Course Outcomes:

The aim of this course is to enable students to

- To develop Skill of Advance HTML using Scripting Language.
- Students will also be able to gain knowledge how to use JavaScript in different manners.
- Students can Learn and Develop Templates Designs by applying jQuery, CSS, Animations methods and HTML5.
- Helpful in develop API Data structure.
- Helpful to Communicate Client and Server communications using JSON and XML Date Structure.
- Helpful in AJAX while they are going to work with Client Server Applications.

Prerequisites:

- Any editor which support Windows OS like Notepad, Notepad++, VS Code etc.
- Any Web Browser

Contents

Unit No.	Particulars	Hours	Credits
1	**Unit Title: JAVASCRIPT & JQUERY** 1. Write a JavaScript Program of “Hello World” to demonstrate the use of script tag and Document.write method. 2. Write a JavaScript program to get the value from user and print Full name, Address, City, Email and Mobile no. 3. Write a JavaScript program verify maximum and minimum of three numbers, using Dynamic value from user make proper function and call that function on Mouse click. 4. Write a java script for calculate factorial using prompt box apply do while loop. 5. Write a JavaScript for print Array elements in Reverse order using while loop. 6. Write a JavaScript for count how many times an element is found in Array using for loop. 7. write a JavaScript to print current date and time in		f o l l o w i n g f o r m a t D a

	te: Month /Date/Year and Time: 05:10:02	**30**	**1**
8.	Write a JavaScript for converting a text in to uppercase text must be characters and must not empty call JavaScript on any Keyboard event.		
9.	Write a JavaScript to Validate Student Registration form, apply all		

possible validations in each control.

10. Write a JavaScript for login page validate username and password must not empty. And also validate password must be 6 characters or more and less the 12 character.
11. Write a JavaScript for verify content of two text box are same or not. If yes or no then print appropriate message.
12. Write a JavaScript to validate Max price and Min Price using Range control. Both are must be greater than 0 also validate max price not less than min price. Apply on Change event.
13. Write a Java Script to check Date of Birth, yours enter date of birth must not before current system Date.
14. Write a JQuery to show the use of ID, Class and Tag selector.
15. Write a JQuery to show the use of First, Last and eq selector.
16. Write a jQuery for table where odd no of rows must be with background color in Blue and Even no of rows in Pink color while move mouse on table row it will change background color green.
17. Write jQuery for paragraph hide and show when click on title of paragraph that paragraph only show rest of paragraphs will hide make 4 paragraphs with title.
18. Write a jQuery to create drop down Manu on following list. While user click on SEM1 then SEM1 list only display SEM2 list should not visible
    I. SEM1
        a. C
        b. HTML
        c. ICET
        d. MATHS

    II. SEM2
        a. ADV.C
        b. DHTML
        c. CN
19. Write a JQuery to print multiplication table get data from user and must be numeric data. Also not allow less than 1 value as input.
20. Write a jQuery to copy fullname, Address, mobile number on Keyboard Event.
21. Write a jQuery for change the background color of web page, select background color from dropdown list.
22. Write a jQuery to get the value from checkbox and display on screen only selected values
23. Write a jQuery to show the fade effect on image while user click on fade in image will show and while click on fade out image will hide.
24. Write a jQuery to get Value from Radio button and display on Screen.

25. Write a jQuery code for verifies first password and second password is same or note. Verify the strength of password in week, medium and strong.

2 Unit Title: JSON AND XML 30 1

***For JOSN programming use HTML and JavaScript we don't have to create any json file. We write codding in script tag and print the output on browser or on console.**

1.Write a JSON program to create a simple object.
2.Write s JSON program to print following object.

```
{ “fullname”:”Miten
 Bhavsar”,
 “Address”:”Baroda”,
 “Moboile”:1234567890
}
```

3.Write a JSON Program to create multiple objects.

```
{
        "Employee":
        {
        "Fullname": "Suhit Patel",
        "Address": "Maninagar",
        "City": "Ahmedabad",
        "Mobile": 1234567890,
        "Email": "suhit123@ymail.com"
        },
        "Experience":
        {
                "Expertise": "JAVA
                Developer", "DOJ":
                "12/01/2019",
                "WorkExp": 4.6,
                "Salary": 56000
        }
 }
```

4.Write a JSON program to demonstrate simple array.
5.Write a Json program to create Array as following.

```
[
        {
                "Title": "Jquey Step by
                Step", "Author": "Maulik
                Patel", "Page": 214,
                "Publisher": "ITSolution",
                "Year": 2020
        },
        {
                "Title": "DBMS Step by Step",
                "Author": "Bhavik Pandya",
                "Page": 300,
```

"Publisher": "ITSolution",

```
            "Year": 2021
        }
    ]
```

5.Write a Json for following Array in Object.

```
{
    "Faculty"
    : [
        {   "Fullname": "Kedar
            Patel", "Age": 39,
            "City": "Ahmedabad",
            "DOB": "24/09/1984"

        },
        {   "Fullname": "Sagar
            Patel", "Age": 36,
            "City":
            "Mehsana",
            "DOB":
            "12/01/1985"

        }
    ]
}
```

6.Write a Json for following Array in Object.

```
{
    "Faculty"
    : [
        {   "Fullname": "Kedar
            Patel", "Age": 39,
            "City": "Ahmedabad",
            "DOB": "24/09/1984"

        },
        {   "Fullname": "Sagar
            Patel", "Age": 36,
            "City":
            "Mehsana",
            "DOB":
            "12/01/1985"

        }
    ]
}
```

7.Write a program to parse string into JSON object.

8. Write a Json for following Array in JSON Object.

{

```
"CAR": [
        {
                "Company": "MARUTI",
                "Model": “Swift”,
                "Variant": "Petrol",
                "MFD": "24/03/2023"
                “Price”:700000
        }
        ,
        {       "Company":
                "Mahindra", "Model":
                “XUV700”,
                "Variant": "Diesel",
                "MFD": "01/01/2023"
                “Price”:1500000
        }
        ,
        {       "Company": "TATA",
                "Model": “NEXON”,
                "Variant": "EV",
                "MFD":
                "01/02/2023"
                “Price”:1900000
        }
        ,
    ]
}
```

9. Write a Program to parse string Data in to JSON object. Use Product data productid, Product name, Price.
10. Write a XML for Mobile Detail. Mobile is a parent tag it has (Company, model, price) child elements.
11. Create an XML document to describe the result of student in an examination. The description should include the students roll number, name, three subject names and marks, total marks, percentage, and result.
12. Create DTD for following.
    - Bank
    - Employee
        - Name
        - Birthdate
    - Date
    - Month
    - Year
        - skills (type)
13. write DTD and XML for University University (Course, Semester) Course (course ID, Course Name) Semester (id is an

attribute) (name)

14. Write an XML for following Main Elements Agency, Owner and Property Agency has following elements Name, Email, phone Owner following elements

name Property has following elements name, description, area, city

15. Write DTD and XML for following Bookstore (Book, title, author, year, price) Book (category attribute) Title (Language Attribute)
16. Write a DTD and XML for Product detail Product (Name, Company, Price) Name (category, unit are attribute) Company (city, pin code are attribute)
17. Write a DTD and XML for Syllabusdetail BCA(SEM,Subject) Subject(subject1,subject2,subject3,subject4)
18. Write an XML for Car detail Car(Model,Type,Category,price,MFD,) Category(sedan, hatchback, XUP,MPV)
19. Write a DTD and XML for Project Detail Project Detail (ProjectID,Projectname,projectdate,totalmember)

Text Book/s:

1. Deven N. Shah, Kogent Learning Solutions Inc., "A Complete Guide to Internet and Web Programming", DREAMTECH PRESS
2. Steve Suehring, "JavaScript Step by Step", 2nd Edition, Microsoft Press US
3. Atul Kahate, "XML and Related Technologies", 1st Edition, Pearson Education

References:

1. Tom Marrs, "JSON at Work", 1st Edition, O'Reilly Media.
2. Kogent Learning Solutions Inc., "HTML 5 in SIMPLE STEPS", DREAMTECH PRESS.
3. Dane Cameron, "HTML5, JavaScript, and jQuery 24- Hour Trainer", 1st Edition, Wrox.
4. Ivan Bayross, "Web Enabled commercial application development using HTML, Javascript, DHTML and php", BPB Publication.
5. Gosselin, "Java Script Indian Edition", 1st Edition, CENGAGE Learning.
6. Kevin Howard Goldberg, "Visual Quick Start XML", 2nd Edition, Pearson Education.
7. Michael Morrison, "Sams Teach Yourself XML in 24 hours", 1st Edition, PEARSON Education.

E-Resources:

1. https://www.w3schools.com/js/
2. https://www.w3schools.com/jquery/
3. https://www.w3schools.com/js/js_json_intro.asp
4. https://www.tutorialspoint.com/javascript/index.htm
5. https://www.tutorialspoint.com/jquery/index.htm
6. https://www.tutorialspoint.com/json/index.htm
7. https://www.json.org/json-_en.html
8. https://www.guru99.com/json-_tutorial-_example.html

Accomplishments of the student after completing the Course:

After completion of this course, students will be able to

- The student would be able to develop a webpage or website.
- Students can use various JavaScript frameworks for developing and building web and mobile apps.
- Students can implement to learn Advance JavaScript Library programs like MEAN and MERN stack development.

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