

Kurukshetra University, Kurukshetra
(Established by the State Legislature Act XII of 1956)
('A+' Grade, NAAC Accredited)

॥ योगस्थः कुरु कर्माणि ॥
समबुद्धि व योग युक्त होकर कर्म करो
(Perform Actions while Stead fasting in the State of Yoga)



Scheme of Examination and Syllabus for Undergraduate Programme
Course: Computer Applications (Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to
NEP-2020) w.e.f 2022-23 in Phased Manner

Kurukshetra University, Kurukshetra

Scheme of Examination and Syllabus for Undergraduate Programme Course: Computer Applications
(Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020) w.e.f 2022-23 in Phased Manner

Semester	Core Course	Paper Code	Nomenclature of Paper	Credits	Work load/ hour/ week	Exam Time (Hrs)	Internal Marks	External Marks	Total Marks	
									Max	Pass
1	CC-1A	B-CAP-N-101	PROBLEM SOLVING USING C	4	4	3	50	50	100	40
		B-CAP- N-102	S/W LAB – I BASED ON B-CAP- N-101	2	4	3	25	25	50	20
	CC-2A	B-CAP- N-103	DATABASE MANAGEMENT SYSTEM	4	4	3	50	50	100	40
		B-CAP- N-104	S/W LAB – II BASED ON B-CAP- N-103	2	4	3	25	25	50	20
	CC-3A	B-CAP- N-105	INTRODUCTION TO WEB TECHNOLOGY	4	4	3	50	50	100	40
		B-CAP- N-106	S/W LAB – III BASED ON B-CAP- N-105	2	4	3	25	25	50	20
2	CC-1B	B-CAP- N-201	DATA STRUCTURES USING C	4	4	3	50	50	100	40
		B-CAP- N-202	S/W LAB – IV BASED ON B-CAP- N-201	2	4	3	25	25	50	20
	CC-2B	B-CAP- N-203	ADVANCED WEB TECHNOLOGIES	4	4	3	50	50	100	40
		B-CAP- N-204	S/W LAB – V BASED ON B-CAP- N-203	2	4	3	25	25	50	20
	CC-3B	B-CAP- N-205	PROGRAMMING WITH JAVASCRIPT	4	4	3	50	50	100	40
		B-CAP- N-206	S/W LAB – VI BASED ON B-CAP- N-205	2	4	3	25	25	50	20

3	CC-1C	B-CAP- N-301	OBJECT ORIENTED PROGRAMMING IN C++	4	4	3	50	50	100	40
		B-CAP- N-302	S/W LAB – VII BASED ON B-CAP- N-301	2	4	3	25	25	50	20
	CC-2C	B-CAP- N-303	OPERATING SYSTEM AND SHELL PROGRAMMING	4	4	3	50	50	100	40
		B-CAP- N-304	S/W LAB – VIII BASED ON B-CAP- N-303	2	4	3	25	25	50	20
	CC-3C	B-CAP- N-305	COMPUTER NETWORKS	4	4	3	50	50	100	40
		B-CAP- N-306	S/W LAB – IX BASED ON B-CAP- N-305	2	4	3	25	25	50	20
4	CC-1D	B-CAP- N-401	PROGRAMMING WITH JAVA	4	4	3	50	50	100	40
		B-CAP- N-402	S/W LAB – X BASED ON B-CAP- N-401	2	4	3	25	25	50	20
	CC-2D	B-CAP- N-403	LOGICAL ORGANIZATION AND COMPUTER ARCHITECTURE	4	4	3	50	50	100	40
		B-CAP- N-404	S/W LAB – X1 BASED ON B-CAP- N-403	2	4	3	25	25	50	20
	CC-3D	B-CAP- N-405	INTERNET TECHNOLOGIES	4	4	3	50	50	100	40
		B-CAP- N-406	S/W LAB – XII BASED ON B-CAP- N-405	2	4	3	25	25	50	20
5	CC-1H	B-CAP- N-501	DESIGN AND ANALYSIS OF ALGORITHMS	4	4	3	50	50	100	40

	B-CAP- N-502	S/W LAB – XIII BASED ON B-CAP- N-501	2	4	3	25	25	50	20
DSE-1	B-CAP- N-503	ELECTIVE –I	4	4	3	50	50	100	40
	B-CAP- N-504	S/W LAB – XIV BASED ON B-CAP- N-503	2	4	3	25	25	50	20
DSE-2	B-CAP- N-505	ELECTIVE – II	4	4	3	50	50	100	40
	B-CAP- N-506	S/W LAB – XV BASED ON B-CAP- N-505	2	4	3	25	25	50	20
SEC-5	B-CAP- N-507	ELECTIVE-III	4	4	3	50	50	100	40
	B-CAP- N-508	S/W LAB – XVI BASED ON B-CAP- N-507	2	4	3	25	25	50	20
ELECTIVE –I (PROGRAMMING FOR DATA SCIENCE)									
	B-CAP- N-503 (I)	PROGRAMMING IN R	4	4	3	50	50	100	40
	B-CAP- N-503 (II)	PROGRAMMING USING PYTHON	4	4	3	50	50	100	40
	B-CAP- N-503 (III)	MOOC							
ELECTIVE –II (DESIGNING AND PUBLISHING)									
	B-CAP- N-505 (I)	COMPUTER GRAPHICS	4	4	3	50	50	100	40
	B-CAP- N-505 (II)	TEACHING, LEARNING, AND DTP PACKAGES	4	4	3	50	50	100	40
ELECTIVE –III (NETWORK SECURITY)									
	B-CAP- N-507 (I)	SECURITY IN COMPUTING	4	4	3	50	50	100	40
	B-CAP- N-507 (II)	CYBER SECURITY	4	4	3	50	50	100	40

6	CC-2H	B-CAP-N-601	SOFTWARE ENGINEERING	4	4	3	50	50	100	40	
		B-CAP- N-602	S/W LAB – XVII BASED ON BCA- N-601	2	4	3	25	25	50	20	
	DSE- 3	B-CAP- N-603	ELECTIVE – IV	4	4	3	50	50	100	40	
		B-CAP- N-604	S/W LAB – XVIII BASED ON B-CAP- N-603	2	4	3	25	25	50	20	
	DSE- 4	B-CAP- N-605	ELECTIVE – V	4	4	3	50	50	100	40	
		B-CAP- N-606	S/W LAB – XIX BASED ON B-CAP- N-605	2	4	3	25	25	50	20	
	SEC- 6	B-CAP- N-607	ELECTIVE - VI	4	4	3	50	50	100	40	
		B-CAP- N-608	S/W LAB – XX BASED ON B-CAP- N-607	2	4	3	25	25	50	20	
	ELECTIVE –IV (DATA SCIENCE)										
		B-CAP- N-603 (I)	DATA SCIENCE USING R	4	4	3	50	50	100	40	
		B-CAP- N-603 (II)	DATA SCIENCE USING PYTHON	4	4	3	50	50	100	40	
	ELECTIVE –V (INTELLIGENT SYSTEMS)										
		B-CAP- N-605 (I)	ARTIFICIAL INTELLIGENCE	4	4	3	50	50	100	40	
		B-CAP- N-605 (II)	MACHINE LEARNING	4	4	3	50	50	100	40	
ELECTIVE –VI (INTERNET TECHNOLOGIES)											
	B-CAP- N-607 (I)	CLOUD COMPUTING	4	4	3	50	50	100	40		
	B-CAP- N-607 (II)	INTERNET OF THINGS	4	4	3	50	50	100	40		

7	RESEARCH COURSES AND THESIS	B-CAP-N-701	RESEARCH ETHICS	4	4	3	50	50	100	40
		B-CAP-N-702	RESEARCH METHODOLOGY	4	4	3	50	50	100	40
	RESEARCH PROGRESS ION SEMINAR	B-CAP-N-703	REVIEW OF LITERATURE GENERAL SEMINAR	4	4	-	-	-	100	40
		B-CAP-N-704	SYNOPSIS WRITING AND SEMINAR	4	4	-	-	-	100	40
8	RESEARCH COURSES AND THESIS	B-CAP-N-801	DISSERTATION/THESIS PREPARATION/ WRITING	20	20	-	-	-	500	200
	RESEARCH PROGRESS ION SEMINAR	B-CAP-N-802	MIDTERM SEMINAR	2	2	-	-	-	50	20
		B-CAP-N-803	PRE- SUBMISSION SEMINAR	2	2	-	-	-	50	20

B-CAP-N-101: Problem Solving using C

Type: Core Course (CC-1A)
 Course Credits: 04
 Contact Hours: 04 hours/week.
 Examination Duration: 3 Hours
 Mode: Lecture
 External Maximum Marks: 50
 Internal Maximum Marks: 50
 Total Max. Marks: 100
 Total Pass Marks: 40 (i.e. 40%)

Instructions To Paper Setter For End Semester Exam: Examiner will be required to set NINE questions in all. Question No.1 will consist of objective type / short-answer type questions covering the entire syllabus. In addition to Question no. 1, the examiner is required to set EIGHT more questions selecting TWO from each UNIT. Student will be required to attempt FIVE questions in all. Question No.1 will be compulsory. In addition to compulsory question, student will have to attempt FOUR more questions selecting ONE question from each UNIT. All questions will carry equal marks.

Course Objectives: The aim of the course is to provide basic knowledge of C as a High level language as one of the programming tool and generating logical development skills using programming.

Course Outcomes: At the end of this course, the student will be able to:

B-CAP-N-101.1 learn the basics of C program, data types and input/output statements.

B-CAP-N-101.2 understand different types of operators, their hierarchies and also control statements of C.

B-CAP-N-101.3 implement programs using arrays and strings.

B-CAP-N-101.4 get familiar with advanced concepts like structures, union etc. in C language.

CO-PO Mapping Matrix for Course Code: B-CAP-N-101

COs#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-CAP-N-101.1	3	3	2	3	3	2	2	2	2	3	2
B-CAP-N-101.2	3	2	3	3	3	2	2	2	2	2	2
B-CAP-N-101.3	2	3	3	3	2	2	2	2	1	1	1
B-CAP-N-101.4	3	2	2	2	3	3	3	3	3	2	2
Average	2.75	2.5	2.5	2.75	2.75	2.25	2.25	2.25	2	2	1.75

CO-PSO Mapping Matrix for Course Code: B-CAP-N-101

COs#	PSO1	PSO2	PSO3	PSO4	PSO5
B-CAP-N-101.1	3	3	2	3	3
B-CAP-N-101.2	3	2	3	3	3
B-CAP-N-101.3	2	3	3	3	2
B-CAP-N-101.4	3	2	2	2	3
Average	2.75	2.5	2.5	2.75	2.75

UNIT-I

Computer Fundamentals: Evolution of Computers through generations, Functional Components of a Computer System, Software, Hardware components of a computer system.

Overview of C: History, Importance, Structure of C Program, Character Set, Constants and Variables, Identifiers and Keywords, Data Types, Assignment Statement, Symbolic Constant.

Input/output: Unformatted & Formatted I/O Function, Input Functions viz. scanf(), getch(), getche(), getchar(), gets(), output functions viz. printf(), putchar(), puts().

UNIT-II

Operators & Expression: Arithmetic, Relational, Logical, Bitwise, Unary, Assignment, Conditional Operators and

Special Operators Operator Hierarchy & Associativity. Arithmetic Expressions, Evaluation of Arithmetic Expression, Type Casting and Conversion. Decision making with if statement, if-else statement, nested if statement, else-if ladder, switch and break statement, goto statement, Looping Statements: for, while, and do-while loop, jumps in loops.

UNIT-III

Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation.

Functions: definition, prototype, function call, passing arguments to a function: call by value, call by reference, recursive functions.

Strings: Declaration and Initialization, String I/O, Array of Strings, String Manipulation Functions: String Length, Copy, Compare, Concatenate etc., Search for a Substring.

Unit – IV

Storage Classes in C: Auto, Extern, Register and Static and their Scope, Storage & Lifetime.

Pointers in C: Declaring and initializing pointers, accessing address and value of variables using pointers; Pointers and Arrays.

User defined data types: Structures - Definition, Advantages of Structure, declaring structure variables, accessing structure members, Structure members initialization, Array of Structures; Unions - Union definition; difference between Structure and Union.

Text Books:

1. Gottfried, Byron S., Programming with C, Tata McGraw Hill.
2. Balagurusamy, E., Programming in ANSI C, Tata McGraw-Hill.

Reference Books:

1. Jeri R. Hanly & Elliot P. Koffman, Problem Solving and Program Design in C, Addison Wesley.
2. Yashwant Kanetker, Let us C, BPB.
3. Rajaraman, V., Computer Programming in C, PHI.
4. Yashwant Kanetker, Working with C, BPB.

B-CAP-N-103: DATA BASE MANAGEMENT SYSTEM

Type: Core Course (CC-2A)
 Course Credits: 04
 Contact Hours: 04 hours/week.
 Examination Duration: 3 Hours
 Mode: Lecture
 External Maximum Marks: 50
 Internal Maximum Marks: 50
 Total Max. Marks: 100
 Total Pass Marks: 40 (i.e. 40%)

Instructions To Paper Setter For End Semester Exam: Examiner will be required to set NINE questions in all. Question No.1 will consist of objective type / short-answer type questions covering the entire syllabus. In addition to Question no. 1, the examiner is required to set EIGHT more questions selecting TWO from each UNIT. Student will be required to attempt FIVE questions in all. Question No.1 will be compulsory. In addition to compulsory question, student will have to attempt FOUR more questions selecting ONE question from each UNIT. All questions will carry equal marks.

Course Objectives: Today almost all real life problems include data. The objective of this course to make students aware about the basic concept of Data. In this paper, students will learn database management and its implementation.

Course Outcomes: At the end of this course, the student will be able to:
 B-CAP-N-103.1. learn basic concepts of database along with its functions and components.
 B-CAP-N-103.2. understand data base architecture and different data models.
 B-CAP-N-103.3. understand functional dependency and normalization.
 B-CAP-N-103.4. write SQL statements to retrieve information and learn the concept of relational algebra and calculus.

CO-PO Mapping Matrix for Course Code: B-CAP-N-103

COs#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-CAP-N-103.1	3	3	2	3	3	2	2	2	3	3	2
B-CAP-N-103.2	3	2	3	3	3	1	2	2	2	2	2
B-CAP-N-103.3	3	3	3	3	2	2	1	2	1	1	2
B-CAP-N-103.4	3	3	2	2	3	3	2	3	3	2	2
Average	3	2.75	2.5	2.75	2.75	2	1.75	2.25	2.25	2	2

CO-PSO Mapping Matrix for Course Code: B-CAP-N-103

COs#	PSO1	PSO2	PSO3	PSO4	PSO5
B-CAP-N-103.1	3	3	2	3	3
B-CAP-N-103.2	3	2	3	3	3
B-CAP-N-103.3	2	3	3	3	2
B-CAP-N-103.4	3	2	2	2	3
Average	2.75	2.5	2.5	2.75	2.75

UNIT – I

Basic Concepts: File Systems vs. DBMS, Characteristics of Database Approach, Abstraction and Data Integration, Database users, Advantages and Disadvantages of DBMS, Database Systems Architecture: Data Models, Schema and Instances, Data Independence, DBMS functions.

UNIT – II

Entity Relationship Model: Entity Types, Entity Sets, Attributes & keys, Relationships Types & instances, Roles and Structural Constraints, E-R Diagrams, Making ER Diagrams for Inventory, Book Store, Library and Flight Management System and other examples.

Codd's Rule for Relational Model ; Relational Data Model: Basic Concepts, Integrity Constraints over Relations, Hierarchical Model, Network Model.

UNIT – III

Functional Dependencies, Decomposition, Types of Functional Dependency, Normalization: Benefits and Need of Normalization, Normal Forms Based on Primary Keys- (1NF, 2NF, 3NF, BCNF), Multi-valued Dependencies, 4 NF, Join dependencies, 5 NF, Domain Key Normal Form.
Transactions: Acid Properties, Operations on Transactions, Concurrency: Problems, Concurrency Control Techniques, Locking Schemes, Deadlock: Methods for Handling Deadlock, Database Backup and Recovery: Recovery Techniques, Shadow Paging, Database Security.

UNIT – IV

SQL: Meaning, Purpose and Need of SQL, Data Types, SQL Components: DDL, DML, DCL and DQL, Basic Queries, Join Operations and Sub-queries, Views, Specifying Indexes. Constraints and its Implementation in SQL. Relational Algebra: Basic Operations: Select, Project, Join, Union, Intersection, Difference, and Cartesian Product etc.
Relational Algebra: Basic Operations: Select, Project, Join, Union, Intersection, Difference, and Cartesian Product etc.
Relational Calculus: Tuple Relational and Domain Relational Calculus. Relational Algebra Vs. Relational Calculus.

Text Books:

1. Elmasri & Navathe, Fundamentals of Database Systems, Pearson Education.
2. A Silberschatz, H Korth, S Sudarshan, Database System and Concepts, McGraw-Hill.

Reference Books:

1. Thomas Connolly Carolyn Begg, Database Systems, Pearson Education.
2. C. J. Date, An Introduction to Database Systems, Addison Wesley.

B-CAP-N-105: INTRODUCTION TO WEB TECHNOLOGY

Type: Core Course (CC-3A)
 Course Credits: 04
 Contact Hours: 04 hours/week.
 Examination Duration: 3 Hours
 Mode: Lecture
 External Maximum Marks: 50
 Internal Maximum Marks: 50
 Total Max. Marks: 100
 Total Pass Marks: 40 (i.e. 40%)

Instructions To Paper Setter For End Semester Exam: Examiner will be required to set NINE questions in all. Question No.1 will consist of objective type / short-answer type questions covering the entire syllabus. In addition to Question no. 1, the examiner is required to set EIGHT more questions selecting TWO from each UNIT. Student will be required to attempt FIVE questions in all. Question No.1 will be compulsory. In addition to compulsory question, student will have to attempt FOUR more questions selecting ONE question from each UNIT. All questions will carry equal marks.

Course Objectives: The aim of the course is to provide knowledge of web as a tool in presenting information. Each and every product in e-world now needs a website, this course will make student knowing about the concept of web design in general.

Course Outcomes: At the end of this course, the student will be able to:
 B-CAP-N-105.1. learn about WWW and search engines.
 B-CAP-N-105.2. understand domain and assigning name to them.
 B-CAP-N-105.3. understand basic web languages and its components.
 B-CAP-N-105.4. perform simple web page designing for practical exposure.

CO-PO Mapping Matrix for Course Code: B-CAP-N-105

COs#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-CAP-N-105.1	3	3	2	3	3	2	2	2	2	3	2
B-CAP-N-105.1	3	2	3	3	3	2	2	2	2	2	2
B-CAP-N-105.1	2	3	3	3	2	2	2	2	1	1	2
B-CAP-N-105.1	3	2	2	2	3	3	2	3	3	2	2
Average	2.75	2.5	2.5	2.75	2.75	2.25	2	2.25	2	2	2

CO-PSO Mapping Matrix for Course Code: B-CAP-N-105

COs#	PSO1	PSO2	PSO3	PSO4	PSO5
B-CAP-N-105.1	3	3	2	3	3
B-CAP-N-105.1	3	2	3	3	3
B-CAP-N-105.1	2	3	3	3	2
B-CAP-N-105.1	3	2	2	2	3
Average	2.75	2.5	2.5	2.75	2.75

UNIT-I

Introduction to Internet and World Wide Web (WWW). Evolution and History of World Wide Web, Web Pages and Contents, Web Clients, Web Servers, Web Browsers. Hypertext Transfer Protocol, URLs. Searching and Web-Casting Techniques, Search Engines and Search Tools, Scripting Languages.

UNIT-II

Web Publishing: Hosting Web Site. Internet Service Provider. Planning and designing Web Site. Web Content Authoring, Web Graphics Design, Web Programming, Steps For Developing Web Site, Choosing the Contents, Home Page, Domain Names, Creating a Website and Markup Languages (HTML, DHTML).

UNIT-III

Web Development: HTML Document Features, HTML and XHTML, Standard XHTML Document Structure, Images, Headers, Text Styles, Text Structuring, Text Colors and Background, Formatting Text, Page Layouts. Hypertext Links, Syntactic Differences between HTML and XHTML. Overview and Features of HTML.

Unit – IV

Images. Ordered and Unordered lists, Inserting Graphics. Table Creation and Layouts, Frame Creation and Layouts, Working with Forms and Menus, Working with Radio Buttons, Check Boxes. Text Boxes.

CSS: Introduction, Types of style sheets, Style specification formats, Font properties, List properties, Color, Alignment of text, Background images, The and <div> tags, Features of CSS.

Text Books:

1. Raj Kamal, Internet and Web Technologies, Tata McGraw-Hill.
2. Ramesh Bangia, Multimedia and Web Technology, Firewall Media.

Reference Books:

1. Thomas A. Powell, Web Design: The Complete Reference, Tata McGraw-Hill
2. Wendy Willard, HTML Beginners Guide, Tata McGraw-Hill.
3. Deitel and Goldberg, Internet and World Wide Web, How to Program, PHI.

B-CAP-N-201: DATA STRUCTURES USING C

Type: Core Course (CC-1B)
 Course Credits: 04
 Contact Hours: 04 hours/week.
 Examination Duration: 3 Hours
 Mode: Lecture
 External Maximum Marks: 50
 Internal Maximum Marks: 50
 Total Max. Marks: 100
 Total Pass Marks: 40 (i.e. 40%)

Instructions To Paper Setter For End Semester Exam: Examiner will be required to set NINE questions in all. Question No.1 will consist of objective type / short-answer type questions covering the entire syllabus. In addition to Question no. 1, the examiner is required to set EIGHT more questions selecting TWO from each UNIT. Student will be required to attempt FIVE questions in all. Question No.1 will be compulsory. In addition to compulsory question, student will have to attempt FOUR more questions selecting ONE question from each UNIT. All questions will carry equal marks.

Course Objectives: Learning of data structure is like learning alphabets to learn any proper language. In this course students will be aware of memory management and use of data structure in computer programming.

Course Outcomes: At the end of this course, the student will be able to:
 B-CAP-N-201.1. learn basics of data structure and algorithm complexities.
 B-CAP-N-201.2. acquire knowledge of arrays and strings.
 B-CAP-N-201.3. understand the idea of implementation for linked lists and stacks.
 B-CAP-N-201.4. learn various searching and sorting techniques along with implementation of queues.

CO-PO Mapping Matrix for Course Code: B-CAP-N-201

COs#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-CAP-N-201.1	3	3	2	3	3	2	2	2	2	3	2
B-CAP-N-201.2	3	2	3	3	3	2	2	2	2	2	2
B-CAP-N-201.3	2	3	3	3	2	2	2	2	1	1	2
B-CAP-N-201.4	3	2	2	2	3	3	2	3	3	2	2
Average	2.75	2.5	2.5	2.75	2.75	2.25	2	2.25	2	2	2

CO-PSO Mapping Matrix for Course Code: B-CAP-N-201

COs#	PSO1	PSO2	PO3	PSO4	PSO5
B-CAP-N-201.1	3	3	2	3	3
B-CAP-N-201.2	3	2	3	3	3
B-CAP-N-201.3	2	3	3	3	2
B-CAP-N-201.4	3	2	2	2	3
Average	2.75	2.5	2.5	2.75	2.75

UNIT – I

Data Structure Definition, Data Type vs. Data Structure, Classification of Data Structures, Data Structure Operations, Applications of Data Structures;

Algorithm Specifications: Performance Analysis and Measurement (Time and Space Analysis of Algorithms- Average, Best and Worst Case Analysis), Asymptotic Notations and their use in Algorithm Handling.

UNIT – II

Arrays: Introduction, Linear Arrays, Representation of Linear Array In Memory, Two Dimensional and Multidimensional Arrays, Sparse Matrix and its Representation, Operations on Array: Algorithm for Traversal, Selection, Insertion, Deletion and its implementation.

String Handling: Storage of Strings, Operations on Strings viz., Length, Concatenation, Substring, Insertion, Deletion, Replacement, Pattern Matching.

UNIT – III

Linked List: Introduction, Array vs. linked list, Representation of linked lists in Memory, Traversing a Linked List, Insertion, Deletion, Searching into a Linked list, Type of Linked List.

Stack: Array Representation of Stack, Linked List Representation of Stack, Algorithms for Push and Pop, Application of Stack: Polish Notation, Postfix Evaluation Algorithms, Infix to Postfix Conversion, Infix to Prefix Conversion,

Recursion.

UNIT – IV

Introduction to Queues: Simple Queue, Double Queue, Circular Queue, Priority Queue, Representation of Queues as Linked List and Array, Applications of Queue. Algorithm on Insertion and Deletion in Simple Queue and Circular Queue.

Searching and Sorting Techniques, Sorting Techniques: Bubble sort, Merge sort, Selection sort, Quick sort, Insertion Sort. Searching Techniques: Sequential Searching, Binary Searching.

Text Books:

1. Seymour Lipschutz, Data Structures, Tata McGraw- Hill Publishing Company Limited, Schaum's Outlines.
2. Yedidyan Langsam, Moshe J. Augenstein, and Aaron M. Tenenbaum, Data Structures Using C, Pearson Education.

Reference Books:

1. Trembley, J.P. And Sorenson P.G., An Introduction to Data Structures With Applications, McGraw- Hill.
2. Mark Allen Weiss, Data Structures and Algorithm Analysis in C, Addison- Wesley.

B-CAP-N-203: ADVANCED WEB TECHNOLOGIES

Type: Core Course (CC-2B)
 Course Credits: 04
 Contact Hours: 04 hours/week.
 Examination Duration: 3 Hours
 Mode: Lecture
 External Maximum Marks: 50
 Internal Maximum Marks: 50
 Total Max. Marks: 100
 Total Pass Marks: 40 (i.e. 40%)

Instructions To Paper Setter For End Semester Exam: Examiner will be required to set NINE questions in all. Question No.1 will consist of objective type / short-answer type questions covering the entire syllabus. In addition to Question no. 1, the examiner is required to set EIGHT more questions selecting TWO from each UNIT. Student will be required to attempt FIVE questions in all. Question No.1 will be compulsory. In addition to compulsory question, student will have to attempt FOUR more questions selecting ONE question from each UNIT. All questions will carry equal marks.

Course Objectives: The objective of this course is to create dynamic web sites. Students will be able to apply their skill for the creation of dynamic web applications such as content management and user registration etc.

Course Outcomes: At the end of this course, the student will be able to:

B-CAP-N-203.1 learn advanced web languages like DHTML and CSS along with its components.

B-CAP-N-203.2 understand operators and control statements in PHP.

B-CAP-N-203.3 gain a detailed knowledge on arrays, functions and strings.

B-CAP-N-203.4 implement his/ her learning in PHP and MySQL.

CO-PO Mapping Matrix for Course Code: B-CAP-N-203

COs#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-CAP-N-203.1	3	3	2	2	2	3	2	2	3	3	2
B-CAP-N-203.2	3	2	3	2	2	3	2	2	1	2	2
B-CAP-N-203.3	3	3	3	2	2	2	2	2	3	1	1
B-CAP-N-203.4	3	2	2	3	2	3	3	3	2	2	2
Average	3	2.5	2.5	2.25	2	2.75	2.25	2.25	2.25	2	1.75

CO-PSO Mapping Matrix for Course Code: B-CAP-N-203

COs#	PSO1	PSO2	PSO3	PSO4	PSO5
B-CAP-N-203.1	3	3	3	3	3
B-CAP-N-203.2	2	2	3	2	2
B-CAP-N-203.3	2	3	3	3	2
B-CAP-N-203.4	3	2	2	2	3
Average	2.5	2.5	2.75	2.5	2.5

Unit- I

DHTML: Introduction, Features, Events, Dynamic Positioning, Layer Object, Properties of STYLE, Dynamic Styles, Inline Styles, Event Handlers. Cascading Style Sheets (CSS): Basic Concepts, Properties, Creating Style Sheets. Common Tasks with CSS: Text, Fonts, Margins, Links, Tables, Colors. Marquee. Mouse Overs. Filters and Transitions. Adding Links. Adding Tables. Adding Forms. Adding Image and Sound. Use of CSS in HTML Documents Linking and Embedding of CSS in HTML Document.

Unit- II

Introduction to PHP: Advantages of PHP, HTML relationship, variable types and their scope, Types of Data, Type conversion, Type casting.

Operators, unary operators, arithmetic operators, logical operators, conditional operators, conversion operators, Comparison operators, Ternary Operator, Scope resolution operator.

Control statements – sequence, conditional statements, loops, jump statements.

Unit- III

Creating an array, Multidimensional arrays, Accessing array, Element Looping with Index based array, Looping with associative array using each () and foreach(), Array Library functions.

Functions and Strings: Function prototypes, arguments, Recursive functions, Mathematical conversion functions.

Strings: Basic operations on strings: Reading from part of a string, Replacing parts of a string, Finding a substring within a string, Trimming whitespace, Changing string case, Comparing strings.

Unit- IV

PHP & MySQL: Introduction MySQL, PhpMyAdmin, PHP MySQL functions, Connecting to a MySQL database, Performing basic database operation(DML) (Insert, Delete, Update, Select), Setting query parameter, Executing query, Join (Cross joins, Inner joins, Outer Joins, Self joins.),Aggregate Functions(sum, avg, count).

Introduction to Cookies and Sessions: Using cookies, Sessions: Starting a session, ending a session, checking session data.

Text Books:

1. Robert W.Sebesta, PHP Programming, Peason Education.
2. Joel Murach, Ray Harris, Murach's PHP and MySQL: Training & Reference.

Reference Books:

1. StevenHolzner, PHP: The Complete Reference.
2. Mario Lurig, PHP Reference: Beginner to Intermediate PHP5.

B-CAP-N-205: PROGRAMMING WITH JAVASCRIPT

Type: Core Course (CC-3B)
 Course Credits: 04
 Contact Hours: 04 hours/week.
 Examination Duration: 3 Hours
 Mode: Lecture
 External Maximum Marks: 50
 Internal Maximum Marks: 50
 Total Max. Marks: 100
 Total Pass Marks: 40 (i.e. 40%)

Instructions To Paper Setter For End Semester Exam: Examiner will be required to set NINE questions in all. Question No.1 will consist of objective type / short-answer type questions covering the entire syllabus. In addition to Question no. 1, the examiner is required to set EIGHT more questions selecting TWO from each UNIT. Student will be required to attempt FIVE questions in all. Question No.1 will be compulsory. In addition to compulsory question, student will have to attempt FOUR more questions selecting ONE question from each UNIT. All questions will carry equal marks.

Course Objectives: The aim of the course is to develop the skill & knowledge of concepts commonly used in dynamic language programming. Student will also be able to learn about client side interfaces through the use of DOM.

Course Outcomes: At the end of this course, the student will be able to:

B-CAP-N-205.1 understand concept of Scripting.

B-CAP-N-205.2 acquire knowledge about fundamentals of JavaScript.

B-CAP-N-205.3 understand the applicability of various objects like window, document used in programming.

B-CAP-N-205.4 acquire the skills that will enable him to design and build high-level web enabled applications.

CO-PO Mapping Matrix for Course Code: B-CAP-N-205

COs#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-CAP-N-205.1	3	3	2	3	1	3	2	3	2	1	2
B-CAP-N-205.2	3	3	3	3	1	3	2	2	2	1	2
B-CAP-N-205.3	3	3	3	3	2	3	2	2	2	1	2
B-CAP-N-205.4	3	3	3	3	2	3	2	3	2	2	3
Average	3	3	2.75	3	1.5	3	2	2.5	2	1.25	2.25

CO-PSO Mapping Matrix for Course Code: B-CAP-N-205

COs#	PSO1	PSO2	PSO3	PSO4	PSO5
B-CAP-N-205.1	3	3	2	3	3
B-CAP-N-205.2	3	2	3	3	3
B-CAP-N-205.3	2	3	3	3	2
B-CAP-N-205.4	3	2	2	2	3
Average	2.75	2.5	2.5	2.75	2.75

UNIT – I

The Nature of JavaScript: Evolution of Scripting Languages, JavaScript -Definition, Programming for Non-Programmers, Introduction to Client-Side Programming, Comparison between Java, JavaScript & VB Script. Enhancing HTML Documents with JavaScript. Static and Dynamic web pages.

UNIT – II

Introduction to JavaScript: Document Object Model (DOM), obtaining user inputs, memory concepts, Character set, case sensitivity, comments, Literals, Expression & Operators, Control Structures, looping constructs, break, continue statements, variables, Data types, Keywords.

UNIT – III

JavaScript types, merge multiple JavaScript into one, Running Scripts, Methods, and Events, Introduction to Objects: String, Date, Boolean, Window, document and various Object interaction.

UNIT – IV

Array declaration and allocation, passing arrays to function, Scoping rules, Recursion and iteration, cookies, Form Validation: Basic validation, Data validation. Introduction to XML.

Text Books:

1. David Flanagan, JavaScript: The Definitive Guide: The Definitive Guide.
2. Chris Bates, Web Programming, Building Internet Applications, WILEY.

Reference Books:

1. Kogent Learning, Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML, AJAX – Black Book, Wiley India Pvt. Ltd.