



MANGALORE UNIVERSITY

State Education Policy – 2024 [SEP-2024]

CURRICULUM STRUCTURE

FOR

BCA

BACHELOR OF COMPUTER APPLICATIONS

CURRICULUM STRUCTURE FOR V TO VI SEMETER BCA

Semester V								
Sl. No	Course Code	Title of the Course	Category of Courses	Teaching Hours per Week	SEE	IA	Total Marks	Credits
1	BCACAC S501	Software Engineering	Core	3	80	20	100	3
2	BCACAC S502	Dynamic Web Programming	Core	4	80	20	100	3
3	BCACAC S503	Design and Analysis of Algorithms	Core	4	80	20	100	3
4	BCACAC S504	Statistical Computing and R Programming	Core	4	80	20	100	3
5	BCACAC S505	Cloud Computing	Core	3	80	20	100	3
6	BCACAC S506	Cryptography and Network Security	Core	3	80	20	100	3
7	BCACAP S507	Design and Analysis of Algorithms -Lab	Practical 1	4	40	10	50	2
8	BCACAP S508	R Programming-Lab	Practical 1	4	40	10	50	2
9	BCACAP S509	Dynamic Web Programming - Lab	Practical 1	4	40	10	50	2
10	BCACAS S501	AI Tools and Techniques	Compulsory	2	40	10	50	2
Sub - Total				35	640	160	800	26

SEMESTER V

Program Name	BCA-GENERAL	Semester	V
Course Title	Software Engineering (Theory)		
Course Code:	BCACACS501	No. of Credits	03
Contact hours	39 Hours	Duration of SEA/Exam	3 Hours
Formative Assessment Marks	20	Summative Assessment Marks	80

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

- How to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment.
- An ability to work in one or more significant application domains.
- Work as an individual and as part of a multidisciplinary team to develop and deliver quality software.
- Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle.
- Demonstrate an ability to use the techniques and tools necessary for engineering practice.

Unit	Description	Hours
1	Introduction: The Problem Domain-Software is Expensive, Late and Unreliable, Maintenance and Rework, Software Engineering Challenges-Scale, Quality and Productivity, Consistency and Repeatability, Change,	13

	The Software Engineering Approach-Phased Development Process, Managing the process. Software Processes: Software Process-Component Software Processes, ETVX Approach for Process Specification, Desired Characteristics of a Software Process-Predictability, Support Testability and Maintainability, Support Change, Early Defect Removal, Process Improvement and Feedback, Software Development Process Models- Waterfall Model, Prototyping, Iterative Development, Comparison of Models.	
2	Software Requirement Analysis and Specification: Software Requirements-Needs for SRS, Requirement Process, Problem Analysis - Data Flow Modelling- Data Flow Diagrams and Data Dictionary, Requirements Specification- Characteristics of an SRS, Components of an SRS, Structure of a Requirement Document, Validation. Function Oriented Design: Design Principles-Problem Partitioning and Hierarchy, Abstraction, Modularity, Top-down and Bottom-up strategies, Module- Level Concepts- Coupling, Cohesion, Design Notation and Specification-Structure Charts, Structured Design.	13
3	Detailed Design: Detailed Design and PDL- PDL Logic/Algorithm Design, Verification-Design Walkthroughs, Critical Design Review, Consistency Checkers. Coding: Programming Principles and Guidelines-Common Coding Errors, Structured Programming, Some Programming Practices, Coding Standards, Verification-Code Inspections	13
4	Testing: Testing Fundamentals-Error, Fault and Failure, Test Oracles, Test Cases and Test Criteria, Black Box Testing- Equivalence Class Partitioning, Boundary Value Analysis, Cause-Effect Graphing, White Box Testing-Control Flow Based Criteria, Data Flow	13

	Based Testing, Testing Process-Levels of Testing, Test Plan, Test Case Specification, Defect Logging and Tracking.	
Text Books: 1. Pankaj Jalote, An Integrated Approach to Software Engineering, 3rd edition, Narosa Publishing House. Reference Books: 1. Roger S. Pressman, Software Engineering: A Practitioner's Approach, McGraw Hill, 2009. 2. K K Aggarwal, Yogesh Singh, Software Engineering, 1st edition, New Age International Pvt Ltd Publishers 3. Renu Rajni, Software Testing: Methodologies, Tools and Processes, Tata McGraw hill education.		

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Quizzes/ Mini Projects/Group Discussion/ Experiential Learning etc.

Program Name	BCA-GENERAL	Semester	V
Course Title	Dynamic Web Programming (Theory)		
Course Code:	BCACACS502	No.of Credits	03
Contact hours	52 Hours	Duration of SEA/Exam	3 Hours
Formative Assessment Marks	20	Summative Assessment Marks	80

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Understand the basics of PHP and MySQL, including their roles in web development.
- Write and execute PHP scripts to create dynamic web pages.
- Use PHP sessions and cookies to manage state and user information.
- Understand the fundamentals of JavaScript, including its syntax and data types.
- Write and execute JavaScript code to create interactive web pages.
- Implement event handling to create responsive user interfaces.

Unit	Description	Hours
1	Overview and features of CSS3. Animation: Introduction, Start and End States, Interpolation, Animations in HTML. All About CSS Animations, creating a Simple Animation, Detailed Look at the CSS Animation Property, Keyframes,	

	Declaring Multiple Animations, Wrap-up. All About CSS Transitions, Adding a Transition	13
2	Introduction to PHP: Introduction to PHP, History and Features of PHP, Understanding PHP, Writing Comments in PHP, Sending Data to the Web Browser, Data types in PHP, Keywords in PHP, Using Variables, Constants in PHP, Expressions in PHP, Operators in PHP, Conditional statements: if, if-else, switch, The ? Operator, Looping statements: while Loop, do-while Loop, for Loop .	13
3	Arrays in PHP: Creating Arrays, Accessing Array elements, Indexed v/s Associative arrays, Multidimensional arrays, using Array Functions. Functions in PHP, Function definition, Creating and invoking user-defined functions, Formal parameters versus actual parameters, Function and variable scope. Strings in PHP: What is String? Creating and Declaring String, String Functions. Class and Objects in PHP: Creating and accessing a Class &Object, Object properties, object methods.	13
4	Form Handling: Creating HTML Form, Handling HTML Form data in PHP Database Handling using PHP with MySQL: Introduction to MySQL, Database terms, Data Types, Accessing MySQL using MySQL Client and Using phpMyAdmin, MySQL Commands, Using PHP with MySQL, PHP MySQL Functions, Connecting to MySQL and Selecting the Database, Executing Simple Queries, Retrieving Query Results, Counting Returned Records, Inserting,	13

	deleting and Updating Records with PHP.	
Textbooks: 1. Kevin Tatroe, Peter MacIntyre and Rasmus Lerdorf, Programming in PHP, 3rd Edition O'Reily Publications 2. Robin Nixon, Learning PHP, My SQL, JavaScript, CSS and HTML5, 3rd Edition, O'Reily Publications 3. Larry Ullman, PHP and MySQL for Dynamic Websites Peachpit Press Reference Books: 1. Deitel, Paul_Deitel, Harvey_Deitel, Abbey - Internet and World Wide Web How to Program-Pearson Education (US) (2011) 2. Steven Holzner, PHP the Complete Reference 3. Chris Bates - Web Programming_ Building Internet Applications-Wiley (2002) 4. Web Programming with HTML5, CSS, and JavaScript-John Dean		

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Quizzes/ Mini Projects/Group Discussion/ Experiential Learning etc.

Program Name	BCA-GENERAL	Semester	V
Course Title	Design and Analysis of Algorithms(Theory)		
Course Code:	BCACACS503	No.of Credits	03
Contact hours	52 Hours	Duration of SEA/Exam	3 Hours
Formative Assessment Marks	20	Summative Assessment Marks	80

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

- Understand the fundamental concepts of algorithms and their complexity, including time and space complexity, worst-case and average-case analysis, and Big-O notation.
- Design algorithms for solving various types of problems, such as Sorting, Searching, and Graph traversal, Decrease-and-Conquer, Divide-and-Conquer and Greedy Techniques.
- Analyze and compare the time and space complexity of algorithms with other algorithmic techniques.
- Evaluate the performance of Sorting, Searching, Graph traversal, Decrease-and-Conquer, Divide-and-Conquer and Greedy Techniques using empirical testing and benchmarking, and identify their limitations and potential improvements.
- Apply various algorithm designs to real-world problems and evaluate their effectiveness and efficiency in solving them.

Unit	Description	Hours
1	Introduction: What is an Algorithm? Fundamentals of Algorithmic problem solving, Important Problem Type. Fundamentals of the Analysis of Algorithm Efficiency: Analysis Framework, Measuring the input size, Units for measuring Running time, Orders of Growth, Worst-case, Best-case and Average-case efficiencies. Asymptotic Notations and Basic Efficiency classes - Informal Introduction, O-notation, Ω-notation, θ-notation, mathematical analysis of non-recursive algorithms - MaxElement, Unique Elements, Mathematical analysis of recursive algorithms- Factorial, Tower of Hanoi	13
2	Brute Force & Exhaustive Search: Introduction to Brute Force approach, Selection Sort and Bubble Sort, Sequential search, String Matching, Closest-Pair Problem. Exhaustive Search -Travelling Salesman Problem, Knapsack Problem.	13
3	Decrease-and-Conquer: Introduction, Insertion Sort, Depth First Search, Breadth First Search Divide-and-Conquer: Introduction, Max and Min, Merge Sort, Binary Search, Strassen's Matrix Multiplication.	13
4	Greedy Technique: Introduction, Prim's Algorithm, Kruskal's Algorithm, Huffman Trees. Limitation of Algorithm Power: Lower bound problem, Decision tree. Backtracking: n-queens problem, subset-sum problem	13
Text Books: 1. Introduction to the Design and Analysis of Algorithms, Anany Levitin: 2nd Edition, 2009, Pearson.		

Reference Books:

1. Computer Algorithms/C++, Ellis Horowitz, Satraj Sahni and Rajasekaran, 2nd Edition, 2014, Universities Press.
2. Introduction to Algorithms, Thomas H. Cormen, Charles E. Leiserson, Ronal L. Rivest, Clifford Stein, 3rd Edition, PHI.
3. Design and Analysis of Algorithms, S. Sridhar, Oxford (Higher Education)

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Quizzes/ Mini Projects/Group Discussion/ Experiential Learning etc.

Program Name	BCA-GENERAL	Semester	V
Course Title	Statistical Computing and R Programming (Theory)		
Course Code:	BCACACS504	No.of Credits	03
Contact hours	52 Hours	Duration of SEA/Exam	3 Hours
Formative Assessment Marks	20	Summative Assessment Marks	80

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

- Explore fundamentals of statistical analysis in R environment.
- Describe key terminologies, concepts and techniques employed in Statistical Analysis.
- Define Calculate, Implement Probability and Probability Distributions to solve a wide variety of problems.
- Conduct and interpret a variety of Hypothesis Tests to aid Decision Making.
- Understand, Analyze, and Interpret Correlation Probability and Regression to 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.	13
2	Reading and writing files, Programming: Calling Functions, Conditions and Loops, stand- alone statement with illustrations in exercise, stacking statements, coding loops, Writing Functions, Exceptions. Basic Data Visualization.	13

3	Descriptive Statistics: Types of Data, Nominal, Ordinal, Scale and Ratio, Measures of Central Tendency, Mean, Mode and Median, Percentiles, Quartiles, Measures of Variability, Mean Absolute Deviation, Range, Inter-Quartile-Range, Standard Deviation, Z-Scores. Coefficient of Variation, Measure of shapes-Skewness and Kurtosis. Charts: Bar Chart, Pie Chart, Frequency Polygon, Stem and Leaf Diagram. Distributions: Binomial, Poisson, Continuous Probability Distribution, Normal Distribution, Uniform Distribution. Estimating the population mean using the t-distribution.	13
4	Statistical Inference and Hypothesis Testing: Types of Hypotheses, and Sample, Null and Alternate Hypothesis, Level of Significance, Type I and Type II Errors, One Sample t-test, Chi Square Test of Independence, One way ANOVA. Correlation and Regression: Analysis of Relationship, Positive and Negative Correlation, Perfect Correlation, Karl Pearson Coefficient of Correlation, Correlation Matrix, Scatter Plots, Simple Regression Analysis.	13
Textbooks: 1. Tilman M. Davies, "The book of R: A first course in programming and statistics", San Francisco, 2016. 2. Ken Black, Business Statistics, New Delhi, Wiley, 2013. Reference Books: 1. Vishwas R. Pawgi, "Statistical computing using R software", Nirali prakashan publisher, e1 edition, 2022. 2. Garrett Grolemond "Hands-On Programming with R" Oreily Publications 3.		

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Quizzes/ Mini Projects/Group Discussion/ Experiential Learning etc.

Program Name	BCA-GENERAL	Semester	V
Course Title	Cloud Computing (Theory)		
Course Code:	BCACACS505	No.of Credits	03
Contact hours	39 Hours	Duration of SEA/Exam	3 Hours
Formative Assessment Marks	20	Summative Assessment Marks	80

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

- Explain the core concepts of the cloud computing paradigm such as how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.
- Apply the fundamental concepts in data centres to understand the trade-offs in power, efficiency and cost.
- Identify resource management fundamentals like resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing.
- Analyze various cloud programming models and apply them to solve problems on the cloud.

Unit	Description	Hours
1	Introduction Cloud computing at a glance, Historical developments, Building cloud computing environment.	13

2	Principles of Parallel and Distributed Computing Eras of computing, Parallel vs. distributed computing, Elements of parallel computing, Elements of distributed computing, Technologies for distributed computing	13
3	Virtualization Introduction, Characteristics of virtualized environments, Taxonomy of virtualization techniques, Virtualization and cloud computing Pros and cons of virtualization	13
4	Cloud Computing Architecture Introduction, The cloud reference model, Types of clouds, Economics of the cloud, Open challenges Cloud Applications Scientific application Business and consumer applications	13
Text Books: 1. Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi: "Mastering Cloud Computing Foundations and Applications Programming", Elsevier, 2013 Reference Books: 1. Barrie Sosinsky: "Cloud Computing Bible", Wiley- India, 2010 2. K Chandrashekar: "Essentials of Cloud Computing", CRC Press, 2015 3. Derrick Rountree, Ileana Castrillo: "The Basics of Cloud Computing", Elsevier, 2014		

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Quizzes/ Mini Projects/ Group Discussion/ Experiential Learning etc.

Program Name	BCA-GENERAL	Semester	V
Course Title	Cryptography and Network Security (Theory)		
Course Code:	BCACACS506	No.of Credits	03
Contact hours	39 Hours	Duration of SEA/Exam	3 Hours
Formative Assessment Marks	20	Summative Assessment Marks	80

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

- To understand basics of Cryptography and Network Security
- To be able to secure a message over insecure channel by various means
- To learn about how to maintain the Confidentiality, Integrity and Availability of a data.
- To understand various protocols for network security to protect against the threats in the network

Unit	Description	Hours
1	Computer and Network Security Concepts: Computer Security Concepts, The OSI Security Architecture, Security Attacks, Security Services, Security Mechanisms, A Model for Network Security Classical Encryption Techniques: Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Rotor Machines, Steganography	13
2	Block Ciphers and the Data Encryption Standard: Block Cipher Principles, The Data Encryption Standard Advanced Encryption Standard: Finite Field Arithmetic, AES Structure, AES Transformation Functions, AES Key Expansion. Public-Key Cryptography and RSA Principles of Public-Key Cryptosystems, The RSA Algorithm.	13

3	Cryptographic Hash Functions Applications of Cryptographic Hash Functions, Two Simple Hash Functions, Secure Hash Algorithm (SHA) Message Authentication Codes Message Authentication Requirements, Message Authentication Functions, MACs Based on Hash Functions. Digital Signatures Digital Signatures, Elgamal Digital Signature Scheme, Schnorr Digital Signature Scheme. Key Management and Distribution: Symmetric Key Distribution Using Symmetric & Asymmetric Encryption.	13
4	Transport-Level Security Web Security Considerations, Transport Layer Security, HTTPS, Secure Shell (SSH), Electronic Mail Security Internet Mail Architecture, Email Formats, Email Threats. System Security: Intruders, Intrusions Detection, Password Management.	13
Text Books: 1. William Stallings, Cryptography and Network Security: Principles and Practices, 7th Edition. Reference Books: 1. Atul Kahate, Cryptography and Network Security, 4th Edition, 2019 2. W. Mao, "Modern Cryptography – Theory and Practice", Pearson Education. 3. Charles P. Pfleeger, Shari Lawrence Pfleeger – Security in computing – Prentice Hall of India.		

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Quizzes/ Mini Projects/Group Discussion/ Experiential Learning etc.

Program Name	BCA-GENERAL	Semester	V
Course Title	Design Analysis and Algorithm -Lab		
Course Code:	BCACAPS507	No.of Credits	02
Contact hours	52 Hours	Duration of SEA/Exam	3 Hours
Formative Assessment Marks	10	Summative Assessment Marks	40

Sl. No.	PART-A Programs
1	Write a program to sort a list of N elements using Selection Sort Technique.
2	Write a program to sort a list of N elements using Insertion Sort Technique.
3	Write a program to read 'n' numbers, find minimum and maximum value in an array using divide and conquer.
4	Write program to implement the BFS algorithm for a graph.
5	Write program to implement the DFS algorithm for a graph.
6	Write a program to implement Strassen's Matrix Multiplication of 2*2 Matrixes.
7	Design and implement in to find a subset of a given set $S = \{S_1, S_2, \dots, S_n\}$ of n positive integers whose SUM is equal to a given positive integer d. For example, if $S = \{1, 2, 5, 6, 8\}$ and $d = 9$, there are two solutions $\{1, 2, 6\}$ and $\{1, 8\}$. Display a suitable message, if the given problem instance doesn't have a solution.

Sl. No.	PART-B Programs												
1	Sort a given set of n integer elements using Merge Sort method and compute its time complexity. Run the program for varied values of n> 5000, and record the time taken to sort.												
2	Write a program to perform Knapsack Problem.												
3	Write a program to perform Travelling Salesman Problem												
4	Write program to generate the Huffman code for the given character and probabilities. <table><tr><td>Character</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td></tr><tr><td>Probability</td><td>0.1</td><td>0.1</td><td>0.2</td><td>0.2</td><td>0.4</td></tr></table>	Character	A	B	C	D	E	Probability	0.1	0.1	0.2	0.2	0.4
Character	A	B	C	D	E								
Probability	0.1	0.1	0.2	0.2	0.4								
5	Write a program that implements Prim's algorithm to generate minimum cost spanning Tree.												
6	Write a program that implements Kruskal's algorithm to generate minimum cost spanning tree.												
7	Write program for solving N-queens problem, by taking value of N as input.												

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	PART-A Writing-5, Logic- 5, Execution -5 Marks	15 Marks
Program-2	PART-B Writing-5, Logic- 10, Execution -5 Marks	20 Marks
Practical Record		05 Marks
Total		40 Marks

Program Name	BCA-GENERAL	Semester	V
Course Title	R Programming -Lab		
Course Code:	BCACAPS508	No.of Credits	02
Contact hours	52 Hours	Duration of SEA/Exam	3 Hours
Formative Assessment Marks	10	Summative Assessment Marks	40

PART A

1. Write a program to create a 3 X 3 matrices A and B and perform the following operations
 - a. $A^T.B$
 - b. $B^T.(A.A^T)$
 - c. $(A.A^T).B^T$
 - d. $[(B.B^T)+(A.A^T)-100I_3]^{-1}$
2. Write R program to find roots of quadratic equation using user defined function. Test the program user supplied values for all possible cases.
3. Write R script to generate prime numbers between two numbers using loops
4. Write an R program to create a list containing strings, numbers, vectors and logical values and do the following manipulations over the list
 - a. Access the first element in the list
 - b. Give the names to the elements in the list
 - c. Add element at some positions in the list
 - d. Remove the element
 - e. print the first and third element
 - f. Update the third element
5. Write an R program to create a Data Frame with following

details and do the following operations.

ItemCode	itemCategory	ItemPrice
1001	Electronics	700
1002	Desktop Supplies	300
1003	Office Supplies	350
1004	USB	400
1005	CD Drive	800

- a. Subset the Data frame and display the details of only those items whose price is greater than or equal to 350.
 - b. Subset the Data frame and display only the items where the category is either “Office Supplies” or “Desktop Supplies”
 - c. Subset the Data frame and display the items where the Itemprice between 300 and 700
 - d. Compute the sum of all ItemPrice
 - e. Create another Data Frame called “item-details” with three different fields itemCode, ItemQtyonHand and ItemReorderLvl and merge the two frames.
6. Create a factor marital_status with levels Married, single, divorced. Perform the following operations on this factor
- a. Check the variable is a factor
 - b. Access the 2nd and 4th element in the factor
 - c. Remove third element from the factor
 - d. Modify the second element of the factor
 - e. Add new level widowed to the factor and add the same level to the factormarital_status
7. Write a R language Script for following operation on Iris Data Set
1. Load the Iris Dataset
 2. View first six rows of iris dataset
 3. Summarize iris dataset
 4. Display number of rows and columns
 5. Display column names of dataset.
 6. Create histogram of values for sepal length
 7. Create scatterplot of sepal width vs. sepal length
 8. Create boxplot of sepal width vs. sepal length
 9. Find Pearson correlation between Sepal.Length and

Petal.Length
10. Create correlation matrix for dataset

PART-B

Note: Implement Using R Script and Solve Manually

1. Write a R program to create a Vector containing following 8 values and perform the following operations.

4 3 0 5 2 9 4 5

- Find mean, median, mode.
- Find the range.
- Find the 35th and 78th percentile.
- Find the variance and standard deviation
- Find the interquartile range.
- Find the z-score for each value.

[R Script: 8 Marks]

Solution: 12 Marks]

2. Write R script to find the correlation coefficient and type of correlation between advertisement expenses and sales

Firm	1	2	3	4	5	6	7	8	9	10
Advertisement Exp. (Rs. In Lakhs)	11	13	14	16	16	15	15	14	13	13
Sales Volume (Rs. In Lakhs)	50	50	55	60	65	65	65	60	60	50

volume using Karl Pearson's coefficient of correlation method (Direct Method).

[R Script: 8 Marks]

Solution: 12 Marks]

3. Write R script to compute the regression equation of y on x from the following data.

Predict the value of y when x=7

X	2	4	5	6	8	11
Y	18	12	10	8	7	5

[R Script: 8 Marks]

Solution: 12 Marks]

4. The times taken by a large group of students to complete a piece of homework, Tminutes, are Normally distributed with a mean of 57 minutes and standard

deviation of

6.5. Find the probability that the time taken by a random student from the group to complete this homework will be less than 60 minutes. Write R script to Find the probability that the time taken by a random student from the group to complete this homework

a) Will be less than 60 minutes

b) Between 50 and 80 minutes

[R Script: 8 Marks]

Solution: 12 Marks]

5. Write R script to perform the following using binomial distribution

i. If $n=4$ and $p=0.10$, find $P(x=3)$

ii. If $n=12$ and $p=0.45$, find $P(5 \leq x \leq 7)$

[R Script: 8 Marks]

Solution: 12 Marks]

6. Perform the following using uniform distribution

between 200 and 240 i. $P(x > 230)$

ii. $P(205 \leq x \leq 220)$

[R Script: 8 Marks]

Solution: 12 Marks]

7. A company has three manufacturing plants, and company officials want to determine whether there is a difference in the average age of workers at the three locations. The following data are the ages of five randomly selected workers at each plant. Perform a one-way ANOVA to determine whether there is a significant difference in the mean ages of the workers at three plants. Use $\alpha=0.01$. Write R script for the above problem.

Plant(Employee Ages)

1	2	3
29	32	25
27	33	24
30	31	24
27	34	25
28	30	25

[R Script: 8 Marks]

Solution: 12 Marks]

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	PART-A Writing-5, Logic- 5, Execution-5 Marks	15 Marks
Program-2	PART-B	20 Marks
Practical Record		05 Marks
Total		40 Marks

Program Name	BCA-GENERAL	Semester	V
Course Title	Dynamic Web Programming -Lab		
Course Code:	BCACAPS509	No.of Credits	02
Contact hours	52 Hours	Duration of SEA/Exam	3 Hours
Formative Assessment Marks	10	Summative Assessment Marks	40

PART A

1. Design a HTML5 web page containing a form with text, password, number, range, email, url, file, submit and reset elements which must be styled using CSS3 according to the following screenshot.

Registration Form

Name:

Password:

Confirm Password:

Conatet Number:

Skill Range:

Email:

Profile URL:

Resume:
 No file chosen

2. Design and implement a web page using HTML and CSS to create a box that performs multiple animations simultaneously.
3. Write a PHP program demonstrating the usage of sessions to store and retrieve user credentials like username and password.

Combine the login, welcome, and logout functionalities into two files –‘index.php’ and ‘welcome.php’.

Login

Username:

Password:

Welcome user2

This is a secure area. You're logged in.

[Logout](#)

4. Write a PHP program with a user interface for calculating age based on the user's birth date. Display the age in years, months, and days

Age Calculator

Enter your birth date:

Your age is 19 years, 9 months, and 8 days.

5. Write a PHP program that collects input from the user through a textbox and checks whether the given number is an Armstrong number or not. 1. If the number is indeed an Armstrong number, display all numbers in range from 1 to that specified number (Note : 0 is Not an Armstrong Number). 2. Perform text validation, including checks for positive integers and general text input.

Armstrong Number Checker

Enter a number:

153 is an Armstrong number.

Armstrong numbers from 1 to 153 are: 1 2 3 4 5 6 7 8 9

Armstrong Number Checker

Enter a number:

100 is not an Armstrong number.

Armstrong Number Checker

Enter a number:

Please enter a valid positive integer.

6. Write a PHP program to create an associative array representing a dictionary with words as keys and their meanings as values.

Allow users to input a word and display its meaning if found, otherwise, display a "Word not found" message. (Please keep 10 pairs of keys and their meanings)

Dictionary

Enter a word:

Meaning: A fruit that grows on trees.

Dictionary

Enter a word:

Word not found.

7. Write a PHP program that includes a user form with a text field and submit buttons for various string manipulations. It will display the result accordingly. (for replace, replace 'a' with 'x').

String Manipulation

Enter a string:

Shuffled string: niIda

PART B

1. Design a webpage with a card or image that changes its size, position, and opacity on hover using CSS transitions and transformations. Use different timing functions.
2. PHP program to implement student registration form using Labels, Text Boxes, Text Area, Checkbox, Radio Buttons, Select and Submit button. (First Name, Last Name, Address, E-Mail, Mobile, City, State, Gender, Hobbies, Blood Group). Display user inserted value in a new PHP page in a neat format.
3. Write a PHP program that implements a class to add and find the difference of two distance values given in feet and inches. The user inputs are collected through an HTML form.

Distance Calculator

Distance 1:

Feet:

Inches:

Distance 2:

Feet:

Inches:

Results:

Sum: 9' 5"

Difference: 5' 8"

4. Develop a PHP program that facilitates the addition, multiplication of two matrices. Utilize HTML for the user interface and PHP for the backend logic. Dynamically generate the required number of textboxes based on the specified number of rows and columns. Implement three distinct buttons to perform each matrix operation. For instance, consider the addition of two matrices as an example.

Matrix Addition

Enter the number of rows:

Enter the number of columns:

Matrix A

3	4	6
4	2	-2

Matrix B

5	6	2
3	5	4

Result Matrix

8	10	8
7	7	2

5. Program to implement a login form where users enter their username and password. Validate the credentials against data stored in a MySQL database and grant access if they are correct.
6. Program to create a feedback form with fields for name, email, subject, and message. Store the submitted feedback data in a MySQL database for later review.
7. Develop a web application for proficiently managing hotel reservations, employing PHP for backend logic and MySQL for data storage. The application should feature a well-structured database table encompassing essential fields such as Room Number (primary key), Room Type (e.g., single semi, single deluxe, double semi, double deluxe, dormitory), Capacity, and Status (booked or available). Within the application's user interface, provide a textbox for entering the room number and two distinct buttons for check-in and check-out functionalities. Ensure that both check in and check-out operations are executed based on the entered room number, facilitating a seamless and intuitive user experience.
 - a) Insert 5 records into the table through the interface, reflecting both available and booked rooms.
 - b) Lists all available rooms and booked rooms on the webpage.
 - c) Change the booking status to "booked" when a user checks in.
 - d) Change the room status to "available" when a user checks out.
 - e) Displays appropriate messages for successful booking, check-out, or if the room number is not present or not in the expected status.

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	PART-A Writing-5, Logic- 5, Execution - 5 Marks	15 Marks
Program-2	PART-B Writing-5, Logic- 10, Execution -5 Marks	20 Marks
Practical Record		05 Marks
Total		40 Marks

Program Name	BCA-General	Semester	V
Course Title	AI Tools and Techniques (Skill Based Practical Course - Compulsory)		
Course Code:	BCACASS501	No. of Credits	02
Contact hours	26 Hours	Duration of SEA/Exam	--
Formative Assessment Marks	10	Summative Assessment Marks	40

Course Outcomes (COs):

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

1. Identify and study different types of AI tools and their environments and develop various projects using them
2. Use the some of the current AI tools.

Q. No	Works to be carried by the students
1	Create an invitation (image format) for the College Annual Day Programme by giving appropriate prompts to AI Tools such as Gemini, ChatGPT, Adobe Firefly or Canva
2	Create a Presentation about any topic using Gamma or NoteBookLM or any other Presentation creation AI Tools
3	Create a static website with at least 5 pages and animated buttons/menu options using Codex, Claude, Caffeine, Gemini, ChatGPT or Antigravity or any other Web Development AI Tool
4	Create a Shopping Cart web Application using Codex, Claude, Caffeine, Gemini, ChatGPT or Antigravity or any other Web Development AI Tool
5	Create a mobile App using AI enabled Android Studio, Replit, Emergent or any other mobile App development AI Tools to detect a car, it's make, model and colour from an image.

Scheme of Evaluation

Internal Assessment	10 Marks (C1) Basis for Internal Assessment Continuous Evaluation: 10 Marks
Evaluation of Report	40 Marks (C2) i) Preparation and presentation: 25 Marks ii) Viva-Voce: 10 Marks iii) Record Book: 05 Marks

Questions Paper for Pattern Core Subjects

Duration:3 Hours

Max.Marks:80

Note: Answer any ten Questions from Part-A. And one full Questions from each unit in Part-B

PART A

1. Answer any 10 questions

$10 \times 2 = 20$

- a.
- b.
- c.
- d.
- e.
- f.
- g.
- h.
- i.
- j.
- k.
- l.

PART B

There are 4 Units - UNIT-I, II, III, IV

Each unit contains 2 main questions and it carry 15 Marks. $4 \times 15 = 60$

Each main question contains 2 or more sub questions.

UNIT-I

2. a)

b)

c)

3. a)

b)

c)

Same pattern for UNIT – II , UNIT - III and UNIT – IV
