MAZHARUL ULOOM COLLEGE
(AUTONOMOUS)

(Established & Managed by the Ambur Muslim Educational Society)
Accredited by NAAC with Grade 'A" CGPA 3.23 in Cycle 3
Affiliated to Thiruvalluvar University, Vellore
Ambur 635802 (Tirupattur District)

COURSE STRUCTURE & SYLLABUS

(For the students admitted from year 2025-2026 onwards)

Programme: BCA

Course: Computer Applications

At the end of the B.C.A Programme, the student will:

Program Outcomes (POs)	
PO Code	**Program Outcome Statement**
PO1	**Core Knowledge and Interdisciplinary Understanding:** Demonstrate a coherent understanding of the field of computer applications, its fundamental principles, specialized areas, and its integration with related disciplines.
PO2	**Communication and Collaboration:** Demonstrate effective communication and interpersonal skills, including analytical reading, clear presentation of ideas, teamwork, and the ability to engage with diverse audiences.
PO3	**Professional and Technical Expertise:** Acquire procedural and practical knowledge for diverse professional roles such as software development, research, teaching, and public service, including the ability to adapt to emerging trends in computer applications.
PO4	**Problem Solving and Application of Computing Principles:** Apply computer application skills, mathematical modeling, and computing methodologies to analyze and solve a wide range of well-defined and open-ended problems across various domains.
PO5	**Ethics, Sustainability, and Professional Conduct:** Exhibit professional integrity and ethical behavior, recognize intellectual property rights, address environmental and sustainability concerns, and promote a safe and responsible working and learning environment.
PO6	**Information/digital literacy:** Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data.
PO7	**Lifelong Learning:** Engage in lifelong learning and work on career enhancement and adapt to changing personal, professional and societal needs.

After the successful completion of the programme, the students are expected to

Program Specific Outcomes (POs)	
PSO Code	**Program Specific Outcome Statement**
PSO1	Develop critical and logical thinking skills, along with a strong foundation in computer science principles, software tools, and programming approaches to effectively solve theoretical and real-world problems in mathematics, statistics, and interdisciplinary domains.
PSO2	Demonstrate the ability to identify, evaluate, and utilize relevant information efficiently for problem-solving and research, while being prepared for higher studies and innovation in computing and applied sciences.
PSO3	Acquire essential technical competencies, communication skills, creativity, and awareness of societal and global issues to enhance employability, contribute to internships and projects, and adapt to evolving technological environments.
PSO4	Analyze the phases of project development and contribute to the design and development of software with the aid of technical expertise leading to career advancement in par with the trending technology.
PSO5	Acquire knowledge to deliver strategies with professional standard for collaborative environment using scientific reasoning through computing skills as an application developer or an entrepreneur

Cognitive Levels of Learning

The cognitive domain, is the first and most common hierarchy of learning objectives (Bloom, 1956). It focuses on the acquisition and application of knowledge and is widely used in the educational setting. It aims to develop the mental skills and the acquisition of knowledge of the individual. The cognitive domain encompasses of six categories which include remembering, understanding, applying, analyzing, evaluating and creating.

Level	Definition	Key Actions
K1 : Remembering	Ability to recall or recognize facts, terms, basic concepts, or answers without necessarily understanding them.	Retrieve, Memorize, Repeat, Define, Identify, Recognize
K2 : Understanding	Comprehending the meaning of information, interpreting or translating knowledge into your own words.	Explain, Describe, Summarize, Interpret, Paraphrase
K3 : Applying	Using knowledge in new situations, such as solving problems or applying theories to real-world situations.	Use, Demonstrate, Implement, Calculate, Practice
K4 : Analyzing	Breaking information into parts to explore understandings and relationships; identifying motives or causes.	Compare, Contrast, Categorize, Distinguish, Examine, Organize
K5 : Evaluating	Making judgments based on criteria and standards, often involving checking and critiquing.	Judge, Critique, Justify, Assess, Prioritize, Recommend
K6 : Creating	Putting elements together to form a new coherent whole or original product.	Design, Develop, Invent, Compose, Construct, Generate

Department of Computer Applications

SYLLABUS AND SCHEME OF EXAMINATIONS – I &II SEMESTER

BCA

Sem	Course Code	Part	Course Category	Course Title	Ins. Hrs/ Week	Credit	Marks CIA	Marks ESE	Total
Semester I	URDU - 25BLU10 / TAMIL - 25BLT10	I	Language–I (Tamil / Urdu)	Urdu-I / Tamil-I	6	3	25	75	100
	25BLE10	II	English	English-I	6	3	25	75	100
	25BCA11	III	Core-I	Python Programming	5	5	25	75	100
	25BECA12A	IV	Elective–I	a) Statistical Methods & its Applications- I	4	3	25	75	100
	25BECA12B			b) Numerical Methods					
	25BSCA13	IV	Skill Enhancement Course (SEC) - I	Computational and Algorithmic Thinking for Problem-Solving	2	2	25	75	100
	25BFCA14	IV	Foundation Course (FC)	Programming Principles Using C	2	2	25	75	100
	25BPCA15	III	Core-II	Practical: Python Programming Lab	5	5	25	75	100
	Total				**30**	**23**			**700**
Semester II	URDU - 25BLU20 / TAMIL - 25BLT20	I	Language–II (Tamil / Urdu)	Urdu-II / Tamil-II	6	3	25	75	100
	25BLE20	II	English	English-II	6	3	25	75	100
	25BCA21	III	Core–III	Object Oriented Programming Concepts Using C++	5	5	25	75	100
	25BECA22A	IV	Elective–II	a) Statistical Methods & its Applications- II	4	5	25	75	100
	25BECA22B			b) Resource Management Techniques					
	25BSCA23	IV	Skill Enhancement Course (SEC) - II	Web Development	2	2	25	75	100
	25BSCA24	IV	Skill Enhancement Course (SEC)- III	Internet Technologies	2	2	25	75	100
	25BPCA25	III	Core–IV	Practical: Object Oriented Programming Concepts Using C++ Lab	5	3	25	75	100
	Total				**30**	**23**			**700**

Semester	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	25BCA11	Core -I	5	5	25	75	100
Course Title	**PYTHON PROGRAMMING**						

Learning Objectives	
LO1	Understand the basic syntax, data types, operators, and expressions in Python programming.
LO2	Demonstrate control flow using conditional statements, loops, and jump statements in Python.
LO3	Define and use functions in Python, including different types of arguments and recursion.
LO4	Manipulate Python data structures such as strings, lists, tuples, and dictionaries effectively.
LO5	Perform file handling operations in Python, including reading, writing, appending, and managing files.

SYLLABUS

Unit	Contents	Hours
I	**Basics of Python Programming**: Features of Python – Literal –Constants – Variables – Identifiers – Key words- Built – in Data Types –Output Statements – Input Statements - Comments – Indentation - Operators - Expressions	15
II	**Control Statements**: Selection/Conditional Branching statements: if, if-else, nested if and if - elif- else statements. Iterative Statements: while loop, for loop, else suite in loop and nested loops. Jump Statements: break, continue and pass statements	15
III	**Functions**: Function Definition – Function Call – Variable Scope and its Lifetime-Return Statement. Function Arguments: Required Arguments, Key ordered Arguments, Default Arguments and Variable Length Arguments-Recursion.	15
IV	**Python Strings**: String operations- Immutable Strings – Built in String Methods and Functions - String Comparison**. Lists**: Creating a list – Access values in List - Updating values in Lists-Nested lists-Basic list operations - List Methods. **Dictionaries**: Creating, Accessing, Updating and Deleting Elements in a Dictionary–Dictionary Functions and Methods.	15
V	**Python File Handling**: Types of files in Python -Opening and Closing files-Reading and writing files: write( ) and write lines( ) methods- append() method–read() and read lines() methods – with keyword –Splitting words - File methods - File Positions – Renaming and deleting files.	15

Text Book(s):

1. Reema Thareja,–Python Programming using problem solving approach, First Edition, 2017,Oxford University Press.
2. Dr.P.Rizwan Ahmed. Python Programming, Margham Publications, Chennai, 2024

Reference Book(s):

1. VamsiKurama,–Python Programming: A Modern Approach, Pearson Education.
2. Mark Lutz, Learning Python, Orielly.

3. Adam Stewarts, –Python Programming, Online.
4. Fabio Nelli–Python Data Analytics, A Press.
5. Kenneth A.Lambert,–Fundamentals of Python–First Programs, CENGAGE Publication.

Web Resource(s):

1. https://www.programiz.com/python-programming
2. https://www.guru99.com/python-tutorials.html
3. https://intellipaat.com/blog/tutorial/python-tutorial/fundamentals-of-python/
4. https://www.geeksforgeeks.org/python-programming-language/
5. https://www.python.org/about/gettingstarted/

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO 1	Understand and explain the fundamental concepts of Python programming including data types, variables, operators, expressions, and basic input/output operations	K1,K2,K3
CO 2	Implement control flow in Python programs using conditional statements, loops, and jump statements for decision-making and iteration.	K2,K3,K4
CO 3	Design and develop modular Python programs using functions, including recursion and different types of function arguments.	K2,K3,K4
CO 4	Manipulate and manage Python data structures such as strings, lists, tuples, and dictionaries to solve real-world problems.	K2,K3,K4
CO 5	Perform file operations in Python including opening, reading, writing, appending, and managing files effectively for data processing tasks.	K2,K3,K5

Relationship Matrix:

Course Outcomes (COs)	Program Outcomes (POs)							Program Specific Outcomes(PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	3	3	3	3	3	3	3	2	2	2	2	2.67
CO2	2	3	3	3	3	2	3	2	2	2	2	2	2.42
CO3	3	2	3	3	2	3	3	3	3	2	2	2	2.58
CO4	3	3	3	3	3	3	3	3	3	3	3	3	3.00
CO5	2	3	3	2	2	3	3	2	2	2	2	3	2.42
												Mean Overall Score	2.62
												Correlation	High

3 – Strong, 2- Medium, 1- Low

Mean Overall Score	Correlation
<=1	Low
>1 & <=2	Medium
>2 & <=3	High

Semester	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	25BPCA15	**Core -II**	5	5	25	75	100
Course Title	**PRACTICAL:PYTHON PROGRAMMING LAB**						

Learning Objectives	
LO 1	Be able to design and program Python applications.
LO 2	Be able to create loops and decision statements in Python.
LO 3	Be able to work with functions and pass arguments in Python.
LO 4	Be able to build and package Python modules for reusability.
LO 5	Be able to read and write files in Python.

SYLLABUS		
Unit	**Contents**	**Hours**
	1. Write a program that: • Declares variables for a student's name, roll number, and marks in 3 subjects. • Uses literals (strings, integers, floats). • Calculates the total and average marks using expressions. • Displays the output using print () and includes comments explaining each part. 2. Create a program that: • Takes two numbers from the user (input as strings). • Converts them to integers (explicit type conversion). • Performs arithmetic, relational, and logical operations. • Displays the results with appropriate messages. 3. Write a program which makes use of function to display all such numbers which are divisible by 7 but are not a multiple of 5, between 1000 and 2000.	75
	4. Write a Python program to: • Create an array (list) of 5 integers. • Access and print the first and last elements. • Use array methods to append a new element and sort the array. • Display the updated array. 5. Create a program that: • Prints all numbers from 1 to 20 using a for loop. • Skips even numbers using continue. • Stops the loop if it encounters a number divisible by 13 using break. 6. Write a program that:	

- Defines a function calculate area () to calculate the area of a rectangle.
- Takes length and width as parameters.
- Returns the area.
- Demonstrates local and global variables.

7. Write a recursive function is palindrome(s) that checks whether a string s is a palindrome.
8. Write a recursive function count vowels(s) that counts the number of vowels (a, e, i, o, u) in a given string.
9. Create a **list** of 5 student names.

- Print the third student's name.
- Update the second student's name.
- Add a new student at the end.
- Display the final list.
- Create a nested list of student names and their grades. Access the grade of the second student.

10. Create a **tuple** of 4 colors.

- Access the first and last element.
- Convert it into a list and update the second color.
- Convert it back into a tuple.
- Create a nested tuple of fruit names and prices.

11. Create a **dictionary** of 3 students and their marks.

- Access the marks of one student.
- Update the marks of one student.
- Delete a student from the dictionary.
- Add a new student.
- Use any 2 dictionary methods (keys (), values (), get (), items (), etc.).

12. Write a program that:

- Opens a file named students.txt in write mode.
- Writes individual lines using write ().
- Writes multiple lines using write lines ().
- Closes the file

13. Write a program that:

- Opens the file students.txt created earlier.
- Reads and displays its content using read ().
- Then re-opens and displays the content using readlines() in a loop.

14. Write a program that:

- Opens students.txt in append mode and adds two more entries.
- Then reads all content, splits each line into words, and prints them.

15. Create a class BankAccount that demonstrates:

- Class definition and object creation.
- Private variables for account number and balance.
- Methods to deposit and withdraw money.

Text Book(s):

1. Reema Thareja,–Python Programming using problem solving approach, First Edition, 2017,Oxford University Press.
2. Dr.P.Rizwan Ahmed. Python Programming, Margham Publications, Chennai, 2024

Reference Book(s):

1. VamsiKurama,–Python Programming: A Modern Approach, Pearson Education.
2. Mark Lutz, Learning Python, Orielly.
3. Adam Stewarts,–Python Programming, Online.
4. Fabio Nelli–Python Data Analytics, A Press.
5. Kenneth A.Lambert,–Fundamentals of Python–First Programs, CENGAGE Publication.

Web Resource(s):

1. https://www.programiz.com/python-programming
2. https://www.guru99.com/python-tutorials.html
3. https://intellipaat.com/blog/tutorial/python-tutorial/fundamentals-of-python/
4. https://www.geeksforgeeks.org/python-programming-language/
5. https://www.python.org/about/gettingstarted/

Course Outcomes

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

CO No.	CO Statement	Cognitive Level (K-Level)
CO 1	Demonstrate the understanding of syntax and semantics of PYTHON programming.	K1 to K5
CO 2	Identify the problem and solve using PYTHON programming techniques	
CO 3	Identify suitable programming constructs for problem solving	
CO4	Analyze various concepts of PYTHON language to solve the problem in an efficient Way.	
CO 5	Develop a PYTHON program for a given problem and test for its correctness.	

Relationship Matrix:

Course Outcomes (COs)	Program Outcomes (POs)							Program Specific Outcomes(PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	2	2	3	2	3	2	3	2	2	2	2	2.33
CO2	3	2	3	3	1	3	2	3	3	2	2	2	2.42
CO3	3	2	3	3	1	3	2	3	3	3	3	3	2.67
CO4	3	2	3	3	2	3	2	3	3	3	3	3	2.75
CO5	3	2	3	3	2	3	3	3	3	3	3	3	2.83
											Mean Overall Score		2.60
											Correlation		High

3 – Strong, 2- Medium, 1- Low

Mean Overall Score	Correlation
<=1	Low
>1 & <=2	Medium
>2 & <=3	High

Semester	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	25BECA12A	Elective - I	4	3	25	75	100
Course Title	**A) STATISTICAL METHODS & ITS APPLICATIONS- I**						

Learning Objectives	
LO1	Tell how descriptive and inferential statistics are used in the modern world
LO2	Show an understanding of measures of location
LO3	Show an understanding of measures of dispersion
LO4	Show an understanding of measures of skewness
LO5	Knowledge about correlation and regression

SYLLABUS

Unit	Contents	Hours
I	Definition - scope and limitations of statistics- classification of data -Tabulation of data- Diagrammatic and Graphical representation of data - Graphical determination of Quartiles ,Deciles and Percentiles. Ogive curves and Lorenz curve.	12
II	Measures of location: Arithmetic mean, median, mode, geometric mean and Harmonic mean and their properties.	12
III	Measures of dispersion: Range, Quartile deviation, mean deviation, Standard deviation, combined Standard deviation and their relative measures-Coefficient of mean deviation	12
IV	Measures of Skewness: KarlPearson's,Bowley's, and kelly'sandco- efficient of Skewness-kurtos moments.-skewness and kurtosis based on moments.	12
V	Correlation - Karl Pearson's coefficient of correlation – Spearman's Rank correlation - Regression Equations- properties of regression coefficients-Angle between regression lines.	12

Note: The proportion between theory and problems shall be 20:80

Text Book(s):

1. Mathematical Statistics-P.R.Vittal-Margham publications Chennai.

Reference Book(s):

1. Fundamental of Mathematical Statistics- S.C.Gupta&V.K.Kapoor- Sultan Chand&Sons -Delhi.
2. Statistical Methods-Dr.S.P.Gupta-Sultan Chand &Sons-Delhi.
3. Business Statistics -P.A.Navnitham –Jai Publication-trichy.
4. Statistics-R.S.N.Pillai and Bagavathi-Sultan Chand-Delhi.
5. ElementsofStatistics-Mode.E.B.-PrenticeHall

Web Resource(s):

https://www.simplilearn.com/what-is-statistical-analysis-article

Course Outcomes		
Upon successful completion of this course ,the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO 1	Knows the basic concept of statistical method	K1,K2
CO 2	Understands the measures of location	K1,K2,K3
CO 3	Understands the measures of dispersion	K2,K3,K4
CO 4	Understands the measures of skewness	K2,K3,K4,K5
CO 5	Understands the correlation and regression equations	K2,K3,K4,K5

Relationship Matrix:

Course Outcomes (COs)	Program Outcomes (POs)							Program Specific Outcomes(PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	2	2	2	2	2	3	2	2	2	3	2	2.25
CO2	3	3	3	2	3	3	3	3	2	2	3	2	2.67
CO3	3	3	3	3	3	3	3	3	3	2	2	3	2.83
CO4	3	3	3	3	3	3	3	2	3	3	2	3	2.83
CO5	3	3	3	3	3	3	3	3	2	3	2	3	2.83
											Mean Overall Score		2.68
											Correlation		High

3 – Strong, 2- Medium, 1- Low

Mean Overall Score	Correlation
<=1	Low
>1 & <=2	Medium
>2 & <=3	High

Semester	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	25BECA12B	Elective - I	4	3	25	75	100
Course Title	**B) NUMERICAL METHODS**						

Learning Objectives	
LO1	Apply least squares method to fit straight lines, parabolas, and exponential curves.
LO2	Solve algebraic and transcendental equations using numerical methods (e.g., Bisection, Newton-Raphson).
LO3	Solve linear equations using methods like Gauss elimination, Jacobi, and Gauss-Seidel.
LO4	Understand and use finite difference operators and factorial polynomials.
LO5	Perform interpolation using Newton, Gauss, Stirling, and Bessel formulas.

SYLLABUS

Unit	Contents	Hours
I	Curve Fitting- Principle of Least square: Fitting of straight line $y = ax + b$ parabola $y = ax\ 2 + bx + c$ exponential curves of forms $y =$, $y = e$, and $y = abx$.	12
II	The solution of numerical algebraic and transcendental Equations: Bisection method – Iteration Method – Regula Falsi Method – Newton– Raphson method.	12
III	Solution of simultaneous linear algebraic equations: Gauss elimination method – Gauss Jordan method – Method of Triangularization – Gauss Jacobi method – Gauss Seidel method.	12
IV	Finite differences: Operators Δ, ∇and E - relation between them — factorial polynomials. Interpolation with equal intervals: Gregory-Newton forward and backward- interpolation formulas.	12
V	Central differences formulae Operators μ, δ and relation with the other operators, Gauss forward and backward formulae, Stirling's formula and Bessel's formula.	12

Text Book(s):

1. P.Kandasamy, K.Thilagavathy (2003) Calculus of Finite differences &Numerical Analysis, S. Chand & Company Ltd., New Delhi-55.

Reference Book(s):

1.Dr.P.Kandasamy, Dr.K.Thilagavathy Dr.Gunavathi –Numerical Methods, S. Chand publications(2023)
2.B.D. Gupta. (2001) Numerical Analysis. Konark Pub. Ltd., Delhi
3. M.K. Venkataraman. (1992) Numerical methods for Science and Engineering National Publishing Company, Chennai.
4. S. Arumugam. (2003) Numerical Methods, New Gamma Publishing ,Palayamkottai.
5. H.C. Saxena. (1991) Finite differences and Numerical analysis S.Chand & Co., Delhi Website and e-learning source

Web Resource(s):

1. https://nptel.ac.in/courses/111107105

Course Outcomes		
Upon successful completion of this course ,the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO 1	Solve the problems of fitting of straight lines, parabolas and the different form of exponential curves.	K1,K2
CO 2	Solve algebraic equations using various methods like Bisection method, Iteration method, Regula Falsi method and Newton – Raphson method.	K1,K2,K3
CO 3	Estimate the solution of simultaneous linear equations using different numerical methods.	K2,K3,K4
CO 4	Define basic concept of operators Δ, ∇and E, Solving interpolation with equal intervals problems using Gregory Newton‟s forward formula and Newton‟s backward formula.	K2,K3,K4,K5
CO 5	Estimate the solution of central difference formula using the methods Gauss's forward, backward formula,Stirling's formula and Bessel's formula	K2,K3,K4,K5

Relationship Matrix:

Course Outcomes (COs)	Program Outcomes (POs)							Program Specific Outcomes(PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	3	2	3	3	2	3	3	2	2	3	3	2.67
CO2	3	3	3	3	3	2	3	3	2	2	3	2	2.67
CO3	3	3	3	3	3	3	3	3	2	3	3	2	2.83
CO4	3	3	3	3	3	3	2	3	2	2	3	3	2.75
CO5	3	3	3	3	3	3	2	3	2	2	3	2	2.67
													2.72
											Correlation		High

3 – Strong, 2- Medium, 1- Low

Mean Overall Score	Correlation
<=1	Low
>1 & <=2	Medium
>2 & <=3	High

Semester	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	25BSCA13	**Skill Enhancement Course (SEC-I)**	2	2	25	75	100
Course Title	**COMPUTATIONAL AND ALGORITHMIC THINKING FOR PROBLEM-SOLVING**						

Learning Objectives	
LO 1	Explain the fundamentals of computational thinking and its applications, including the role of data logic and historical context.
LO 2	Demonstrate the ability to write and trace algorithms, flowcharts, and pseudocode for simple computational problem
LO 3	Apply selection and repetition control structures to solve problems using various data types and operators
LO 4	Utilize arrays, strings, and modular programming concepts (functions, recursion, and scope) to design structured and reusable code.
LO 5	Design, document, test, and modify programs using sequential files and data flow diagrams for effective data management.

SYLLABUS		
Unit	**Contents**	**Hours**
I	**Basics**: Introduction to Computational Thinking- Data Logic - History of Computational Thinking Applications of Computational Thinking	**6**
II	Data: Data types, Input, Processing of data, Arithmetic Operators, Hierarchy of operations and Output. **Algorithm**: Features of good algorithm, Benefits and drawbacks of algorithm. **Flowcharts**: Advantages and limitations of flowcharts - flowchart symbols and types of flowcharts. Pseudocode: Writing a pseudocode. Coding, documenting and testing a program: Comment lines and types of errors.	**6**
III	**Selection Structures**: Relational and Logical Operators - Selecting from Several Alternatives – Applications of Selection Structures. Repetition Structures: Counter Controlled Loops –Nested Loops– Applications of Repetition Structures.	**6**
IV	**Data**: Numeric Data and Character Based Data. **Arrays**: One Dimensional Array - Two Dimensional Arrays – Strings as Arrays of Characters.	**6**
V	**Data Flow Diagrams**: Definition, DFD symbols and types of DFDs. **Program Modules**: Subprograms-Value and Reference parameters- Scope of a variable - Functions – Recursion. **Files**: File Basics-Creating and reading a sequential file- Modifying Sequential Files	**6**

Text Book(s):

1. David Rileyand Kenny Hunt, Computational Thinking for Modern Solver, Chapman & Hall/CRC,2014.
2. Dr.P.Rizwan Ahmed, Problem Solving Techniques, Margham Publications, Chennai 2019

Reference Book(s):

1. Paolo Ferragina, Fabrizio Luccio, Computational Thinking First Algorithms, Springer, 2018.

Web Resource(s):

1. https://www.codesansar.com/computer-basics/problem-solving-using-computer.htm
2. http://www.nptel.iitm.ac.in/video.php?subjectId=106102067
3. http://utubersity.com/?page_id=876

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO 1	Define the basic principles of Logical reasoning, Problem Solving in Computational Thinking	K1,K2
CO 2	Study the data types and arithmetic operations. Know about the algorithms. Develop program using flow chart and pseudocode.	K1,K2,K3
CO 3	Determine the various operators. Explain about the structures. Illustrate the concept of Loops	K2,K3,K4
CO 4	Study about Numeric data and character-based data. Analyze about Arrays.	K3,K4,K5
CO 5	Explain about DFD Illustrate program modules. Creating and reading Files	K3,K4,K5

Relationship Matrix:

Course Outcomes (COs)	Program Outcomes (POs)							Program Specific Outcomes(PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	3	3	3	3	2	3	3	2	2	2	2	2.58
CO2	3	3	3	3	3	3	3	3	2	2	2	2	2.67
CO3	3	3	3	3	3	3	3	3	2	2	2	2	2.67
CO4	3	3	3	3	3	3	3	2	2	2	2	2	2.58
CO5	3	3	3	3	3	3	3	2	2	2	2	2	2.58
												Mean Overall Score	2.62
												Correlation	High

3 – Strong, 2- Medium, 1- Low

Mean Overall Score	Correlation
<=1	Low
>1 & <=2	Medium
>2 & <=3	High

Semester	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	25BFCA14	Foundation Course (FC)	2	2	25	75	100
Course Title	**PROGRAMMING PRINCIPLES USING C**						

Learning Objectives	
LO 1	To familiarize the students with the Programming basics and the fundamentals of C
LO 2	Data types in C, Mathematical and logical operations.
LO 3	To understand the concept using if statements and loops.
LO 4	This unit covers the concept of Arrays
LO 5	This unit covers the concept of Function

SYLLABUS

Unit	Contents	Hours
I	Overview of C: Importance of C, sample C program, C program structure, executing C program. Constants, Variables, and Data Types: Character set, C tokens, keywords and identifiers, constants, variables, data types, declaration of variables, Assigning values to variables—Assignment statement, declaring a variable and constant, as volatile .Operators and Expression.	6
II	Decision Making and Branching: Decision making with If, simple IF, IF ELSE, nested IF ELSE, ELSE IF ladder, switch, GOTO statement. Decision Making and Looping: While, Do While, For, Jumps in loops.	6
III	Arrays: Declaration and accessing of one & two dimensional arrays, initializing two dimensional arrays, multi dimensional arrays.	6
IV	Functions: The form of C functions, Return values and types, calling a function, categories of functions, Nested functions, Recursion, functions with arrays ,call by value, call by reference, storage classes character arrays and string functions.	6
V	Pointers: definition, declaring and initializing pointers, accessing a variable through address and through pointer, pointer expressions, pointer increments and scale factor, pointers and arrays, pointers and functions, pointers and structures.	6

Text Book(s):

1. E. Balagurusamy, Programming in ANSIC, Fifth Edition,TataMcGraw-Hill,2010.

Reference Book(s):

1. Byron Gottfried, Schaum‘s Outline Programming with C, Fourth Edition, Tata McGraw -Hill, 2018.
2. Dr.P.Rizwan Ahmed, Programming in C (ANSI C), Margham Publications, Chennai 2020
3. Yashavant Kanetkar, Let Us C, Eighteenth Edition, BPB Publications, 2021.

Web Resource(s):

1. https://www.techonthenet.com/c_language/index.php
2. https://www.geeksforgeeks.org/c-programming-language/
3. https://cs50.harvard.edu/x/2022/notes/0/
4. https://www.fresh2refresh.com/c-programming/
5. https://www.cprogramming.com/tutorial/c-tutorial.html

Course Outcomes		
Upon successful completion of this course,the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO1	Remember the program structure of C with its syntax and semantics.	K1,K2,K3
CO2	Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers and files)	K1,K2,K3
CO3	Apply the programming principles learnt in real-time problems.	K2,K3,K4
CO4	Analyze the various methods of solving problem and choose the best method.	K2,K3,K4,K5
CO5	To write code, debug and test the programs with appropriate test cases, test cases	K2,K3,K4,K5

Relationship Matrix:

Course Outcomes (COs)	Program Outcomes (POs)							Program Specific Outcomes(PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	3	3	3	3	3	3	3	2	2	2	2	2.67
CO2	3	3	3	3	3	3	3	3	2	2	2	2	2.67
CO3	3	3	3	3	3	3	3	3	2	2	2	2	2.67
CO4	2	3	2	3	3	3	3	2	2	2	2	2	2.42
CO5	3	3	3	3	3	3	3	2	2	2	2	2	2.58
												Mean Overall Score	2.6
												Correlation	High

3 – Strong, 2- Medium, 1- Low

Mean Overall Score	Correlation
<=1	Low
>1 & <=2	Medium
>2 & <=3	High

SEMESTER – II

Semester	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	25BCA21	Core–III	5	5	25	75	100
Course Title	**OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++**						

Learning Objectives	
LO1	Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and object
LO2	Understand dynamic memory management techniques using pointers, constructors, destructors
LO3	Describe the concepts of function overloading, operator overloading, virtual functions and polymorphism.
LO4	Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming
LO5	Demonstrate the use of various OOPs concepts with the help of programs.

SYLLABUS		
Unit	Contents	Hours
I	Introduction to C++- key concepts of Object-oriented Programming- Tokens – keywords - Identifiers – Constants – Operators-Variables - I/O in C++ - Control Structures – Decision Making statements : if ..else, jump, goto, break, continue, switch statements – Looping statements– functions	15
II	Classes and Objects: Declaring objects – Defining Member Functions- Inline Functions- Function Overloading-Friend Functions- Constructors – Constructors without Parameters – Parameterized Constructor - Copy Constructors- Destructors.	15
III	Operator Overloading: Overloading unary, binary operators- type conversion- Inheritance: Types of inheritance – Single Inheritance, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance – Hybrid Inheritance – Multipath Inheritance.	15
IV	Pointers – Declaration – Pointer to Class - this pointer -Arrays- Characteristics – Array of Classes – Dynamic Memory Allocation : new and delete operators – virtual functions.	15
V	File – File stream classes – File modes – Sequential Read / write operations – Binary and ASCII Files – Random Access Operations – Templates – Exception Handling	15

Text Book(s):

1. E. Balagurusamy, “Object-Oriented Programming with C++”, TMH 2013, 7th Edition.

Reference Book(s):

1. Ashok N Kamthane, “Object-Oriented Programming with ANSI and Turbo C++”, Pearson Education 2003.
2. Maria Litvin & Gray Litvin, “C++ for you”, Vikas publication 2002.
3. Dr.P.Rizwan Ahmed, Programming in C++, Margham Publications,2019

Web Resource(s):

1. https://cplusplus.com/doc/tutorial/

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO 1	Remember the program structure of C++ with its syntax and semantics	K1,K2,K3
CO 2	Understanding the programming principles in C++ (Data types, operators, branching and looping, arrays, functions, structures)	K1,K2,K3
CO 3	Apply the programming principles learnt in real time problems	K2,K3,K4
CO 4	Analyze the various methods of solving a problem and choose the best methods	K2,K3,K4,K5
CO 5	Code, debug and test the programs with appropriate test cases	K2,K3,K4,K5

Relationship Matrix:

Course Outcomes (COs)	Program Outcomes (POs)							Program Specific Outcomes(PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	3	3	3	3	3	3	3	2	2	2	2	2.67
CO2	3	3	3	3	3	3	3	3	2	2	2	2	2.67
CO3	3	3	3	3	3	3	3	3	2	2	2	2	2.67
CO4	2	3	3	3	3	3	3	2	2	2	2	2	2.50
CO5	3	3	3	3	3	3	3	2	2	2	2	2	2.58
											Mean Overall Score		2.62
											Correlation		High

3 – Strong, 2- Medium, 1- Low

Mean Overall Score	Correlation
<=1	Low
>1 & <=2	Medium
>2 & <=3	High

Semester	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	25BPCA25	Core–IV	5	3	25	75	100
Course Title	**PRACTICAL:OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++ LAB**						

Learning Objectives	
LO1	Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects
LO2	Understand dynamic memory management techniques using pointers, constructors, destructors, etc
LO3	Describe the concept of function overloading, operator overloading, virtual functions and polymorphism
LO4	Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming
LO5	Demonstrate the use of various OOPs concepts with the help of programs

SYLLABUS		
Unit	**Contents**	**Hours**
	1. Write a C++ program to demonstrate function overloading, Default Arguments and Inline function. 2. Write a C++ program to demonstrate Class and Objects 3. Write a C++ program to demonstrate the concept of Passing Objects to Functions 4. Write a C++ program to demonstrate the Friend Functions. 5. Write a C++ program to demonstrate the concept of Passing Objects to Functions. 6. Write a C++ program to demonstrate Constructor and Destructor 7. Write a C++ program to demonstrate Unary Operator Overloading 8. Write a C++ program to demonstrate Binary Operator Overloading **9.** Write a C++ program to demonstrate: ▪ Single Inheritance ▪ Multilevel Inheritance ▪ Multiple Inheritance ▪ Hierarchical Inheritance ▪ Hybrid Inheritance 10. Write a C++ program to manipulate a Text File 11. Write a C++ program to perform Sequential I/O Operations on a file. 12. Write a C++ program to find the Biggest Number using Command Line Arguments 13. Write a C++ program to demonstrate Class Template 14. Write a C++ program to demonstrate Function Template 15. Write a C++ program to demonstrate Exception Handling	75

Text Book(s):

1. E. Balagurusamy, “Object-Oriented Programming with C++”, TMH 2013, 7th Edition.
2. Dr.P.Rizwan Ahmed, Programming in C++, Margham Publications,2019

Reference Book(s):

1. Ashok N Kamthane, “Object-Oriented Programming with ANSI and Turbo C++”, Pearson Education 2003.
2. Maria Litvin & Gray Litvin, “C++ for you”, Vikas publication 2002.

Web Resource(s):
https://cplusplus.com/doc/tutorial/

Course Outcomes		
Upon successful completion of this course ,the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO 1	Recall and understand fundamental concepts of C++ such as function overloading, default arguments, inline functions, and class definitions.	K1 to K5
CO 2	Apply object-oriented programming principles like classes, objects, constructors, destructors, friend functions, and operator overloading in C++.	
CO 3	Implement various inheritance types (single, multiple, multilevel, hierarchical, hybrid) and demonstrate polymorphism using real-world examples.	
CO 4	Develop programs using templates, file handling, and command-line arguments to perform data manipulation and generalize solutions.	
CO 5	Analyze and handle runtime errors using exception handling techniques to build robust and fault-tolerant programs.	

Relationship Matrix:

Course Outcomes (COs)	Program Outcomes (POs)							Program Specific Outcomes(PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	3	3	3	3	3	3	3	2	2	2	2	2.67
CO2	3	3	3	3	3	3	3	3	2	2	2	2	2.67
CO3	3	3	3	3	3	3	3	3	2	2	2	2	2.67
CO4	2	3	3	3	3	3	3	2	2	2	2	2	2.50
CO5	3	3	3	3	3	3	3	2	2	2	2	2	2.58
											Mean Overall Score		2.62
											Correlation		High

3 – Strong, 2- Medium, 1- Low

Mean Overall Score	Correlation
<=1	Low
>1 & <=2	Medium
>2 & <=3	High

Semester	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	25BECA22A	Elective -II	4	5	25	75	100
Course Title	**A) STATISTICAL METHODS & ITS APPLICATIONS-II**						

Learning Objectives	
LO 1	To increase the span of attention of concepts
LO 2	To link concepts related to one unit with other units
LO 3	Give clarity on the intended learning outcomes of the unit.
LO 4	To acquire knowledge about Test of Significance-
LO 5	Knowledge about Analysis of variance.

SYLLABUS		
Unit	Contents	Hours
I	**Probability** Sample Space-events-probability-Addition and Multiplication Theorem-conditional probability - Baye's Theorem and simple problems	12
II	**Probability Distribution** Binomial, Poisson, Normal distribution and fitting distribution	12
III	**Test of Hypothesis** Sample and population hypothesis-large and small samples- Procedure for testing of hypothesis-standard Error-critical values-large sample tests for mean and proportions	12
IV	**Test of Significance(Small Samples Tests)** Small sample proportions tests-paired t-test for Mean, Difference between Means and F-test - Definition of Chi-square test – Assumption–Chi-square tests for Goodness of fit and Independence of attributes – Simple Problems.	12
V	Analysis of variance–One and Two way classifications-Basic principle of design of Experiments Randomization, L.S.D.	12

Text Book(s):

MATHEMATICAL STATISTICS-P.R.Vittal-Margham publications Chennai.

Reference Book(s):

1. Fundamental of Mathematical Statistics- S.C.Gupta&V.K.Kapoor- Sultan Chand&Sons -Delhi.
2. Statistical Methods-Dr.S.P.Gupta-Sultan Chand &Sons-Delhi.
3. Business Statistics -P.A.Navnitham –Jai Publication-trichy.
4.Statistics-R.S.N.Pillai and Bagavathi-Sultan Chand-Delhi
5. Statistical Methods-SnedecorG.W.&CochranW.G. oxford&+DII

Web Resource(s):

https://nptel.ac.in/courses/111107105

Course Outcomes		
Upon successful completion of this course ,the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO1	Know and understand about Sample Space-events- probability	K1,K2,K3
CO2	Know and understand about Standard Probability distributions	K1,K2,K4
CO3	Know and understand about Test of Hypothesis	K1,K2,K3
CO4	Know and understand about Test of Significance	K2,K3,K4
CO5	Understand the Analysis of variance	K3,K4,K5

Relationship Matrix:

Course Outcomes (COs)	Program Outcomes (POs)							Program Specific Outcomes(PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	2	2	3	3	3	3	2	2	2	2	2	2.42
CO2	3	3	3	3	2	3	3	2	2	2	3	2	2.58
CO3	3	3	3	3	3	3	3	3	3	3	2	3	2.92
CO4	3	3	3	3	3	3	3	3	3	3	2	2	2.83
CO5	3	3	3	3	3	3	3	3	2	3	3	2	2.83
											Mean Overall Score		2.72
											Correlation		High

3 – Strong, 2- Medium, 1- Low

Mean Overall Score	Correlation
<=1	Low
>1 & <=2	Medium
>2 & <=3	High

Semester	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	25BECA22B	Elective–II	4	5	25	75	100
Course Title	**B)RESOURCE MANAGEMENT TECHNIQUES**						

Learning Objectives	
LO 1	To learn the basic concept of operation research theory which are frequently applied to business decision making ¬
LO 2	To acquire the knowledge about linear programming problems
LO 3	Knowledge about simplex methods.
LO 4	To acquire knowledge about Mathematical formulation of transportation problem
LO 5	Knowledge about Mathematical formulation of transportation problem

SYLLABUS		
Unit	Contents	Hours
I	Development of OR -Definition of OR -Modelling in OR -general methods for solving OR models -Main characteristics and phases of OR study -tools, techniques and methods –scientific methods in OR – scope of OR.	12
II	Linear programming problems-Mathematical formulation of L.P.P.- slack and surplus variables - graphical solution of L.P.P.	12
III	Simplex methods- Computational procedure- Artificial variables Technique- two phase method-Duality in linear programming	12
IV	Mathematical formulation of assignment problem,-Method for solving The assignment problem.	12
V	Mathematical formulation of transportation problem-optimal solution of T.P.-Methods for obtaining initial feasible solution-optimal solution-Degeneracy in T.P.-Unbalanced T.P	12

Text Book(s):

Operations Research-S.D.Sharma-KedarNath Ramnath&Co-1997.Chapter1to6(all sections)

Reference Book(s):

1.OperationsResearchGupta,ManMohan,Gandhiswarup-Sulthand-ChandPublications
2. Ackoff R.L. and Sasieni M. W," Fundamentals of Operations Research", John Wiley and sons New York 1968
3.Chames A.CooperW.andHendersenA.,"IntroductiontoLinearProgramming",WileyandSons New York
4. Srinath L.S,"PERT and CPM principles and applications ", Affiliated East West Press Pvt.Ltd. New York.

Web Resource(s):

1.htt11://ebooks.i11ude.in.011erationsresearch/
2.htt11://ocw.mit.in/

Course Outcomes		
Upon successful completion of this course ,the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO 1	To develop skills for decision making.	K1,K2,K3
CO 2	To make use of Linear programming problems	K2,K3,K4
CO 3	To make use of Simplex methods	K2,K3,K4
CO 4	To make use of Mathematical formulation of assignment problem	K2,K3,K4,K5
CO 5	To utilize Mathematical formulation of transportation problem	K2,K3,K4,K5

Relationship Matrix:

Course Outcomes (COs)	Program Outcomes (POs)							Program Specific Outcomes(PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	2	3	3	3	2	3	3	2	2	2	3	2.5
CO2	3	3	3	3	2	3	2	3	2	2	2	2	2.5
CO3	3	3	3	3	3	3	3	3	2	3	2	3	2.83
CO4	3	3	3	2	3	3	3	3	3	2	2	2	2.67
CO5	3	3	3	2	3	2	3	3	3	2	3	2	2.67
											Mean Overall Score		2.63
											Correlation		High

3 – Strong, 2- Medium, 1- Low

Mean Overall Score	Correlation
<=1	Low
>1 & <=2	Medium
>2 & <=3	High

Semester	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	25BSCA23	Skill Enhancement Course (SEC) - II	2	2	25	75	100
Course Title	**WEB DEVELOPMENT**						

Learning Objectives	
LO 1	Define key terms related to web development such as Internet, Web browsers, HTML, and identify various web development tools like Notepad++, Dreamweaver, and WordPress.
LO 2	Explain the structure and purpose of HTML tags including block-level elements, font-style elements, and their roles in organizing web content
LO 3	Construct web pages using HTML to create lists, insert images, add hyperlinks, and apply formatting tags
LO 4	Differentiate between various table and form elements in HTML by organizing content with proper alignment, row/column span, and user input controls.
LO 5	Develop visually styled and well-structured web pages using advanced CSS features, including selectors, background styles, and multiple style sheets

SYLLABUS

Unit	Contents	Hours
I	Introduction: Web Basics: Internet–Web browsers- Web page – Softwares for Web Development - Notepad/Notepad++, Dreamweaver, Blue Griffon, Net beans, Sea Monkey, Word press, Sublime. HTML Basics: Tags for Document structure - Block level text elements –Font-style elements	6
II	Lists: Types of lists: Ordered, Unordered– Nesting Lists–Other tags: Marquee, HR, BR- Using Images –Creating Hyper-links	6
III	Tables: Creating basic Table, Table elements, Caption–Table and cell alignment–Row span, Col span–Cell padding.	6
IV	Frames: Frameset–Targeted Links–No frame–Forms: Input, Text area, Select, Option - CSS: Introduction, Features and benefits of CSS, CSS Syntax, External Style Sheet using , Multiple Style Sheets	6
V	Selectors: ID Selectors. Class Selectors, Grouping Selectors, Universal Selector, Descendant / Child Selectors, Attribute Selectors, CSS-Pseudo Classes. Color Background Cursor: background-image, background-repeat, background position, CSS Cursor	6

Text Book(s):

1. Jon Duckett, HTML and CSS: Design and Build Websites, Wiley
2.Jennifer Niederst Robbins, Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics, O'Reilly Media.

Reference Book(s):

1. Rob Larsen, Beginning HTML and CSS, Wiley **2.** Jon Duckett, Web Design with HTML, CSS, JavaScript and jQuery Set, Wiley
Web Resource(s):
1. https://html.com/ **2.** https://www.geeksforgeeks.org/web-development/ **3.** https://developer.mozilla.org/en-US/docs/Web

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO 1	Demonstrate foundational knowledge of web technologies and development environments.	K1,K2,K3
CO 2	Create well-structured, semantic HTML documents.	K2,K3,K4
CO 3	Design interactive and user-friendly web pages.	K3,K4,K5
CO 4	Apply CSS for web page presentation and layout control	K3,K4,K5
CO 5	Build multi-page websites with consistent styling and layout techniques	K3,K4,K5

Relationship Matrix:

Course Outcomes (COs)	Program Outcomes (POs)							Program Specific Outcomes(PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	3	3	3	3	3	3	3	2	3	2	2	2.75
CO2	3	3	2	3	3	3	3	3	2	2	2	2	2.58
CO3	3	3	3	3	3	3	3	3	2	3	2	2	2.75
CO4	3	3	3	3	3	3	3	3	2	2	3	2	2.75
CO5	3	3	3	3	3	3	3	3	2	2	2	2	2.67
											Mean Overall Score		2.7
											Correlation		High

3 – Strong, 2- Medium, 1- Low

Mean Overall Score	Correlation
<=1	Low
>1 & <=2	Medium
>2 & <=3	High

Semester	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	25BSCA24	Skill Enhancement Course (SEC)- III	2	2	25	75	100
Course Title	**INTERNET TECHNOLOGIES**						

Learning Objectives	
LO 1	Describe the history, evolution, and structure of the Internet, including ARPANET and World Wide Web, and explain basic Internet terminology and applications
LO 2	Explain the working of packet switching technology, TCP/IP protocols, Internet addressing schemes, and various email communication protocols such as SMTP, POP3, IMAP4, and MIME.
LO 3	Identify various Internet Service Provider (ISP) options and compare types of Internet connections, including dial-up, ISDN, and wireless technologies like Wi-Fi and hotspots.
LO 4	Define common network terminologies and describe network types, components, and addressing systems such as DNS and domain structures.
LO 5	Demonstrate the structure and working of email systems, social networking platforms, and online education tools, including sending/receiving messages and understanding email headers and attachments

SYLLABUS		
Unit	**Contents**	**Hours**
I	Internet, Growth of Internet, Owners of the Internet, Anatomy of Internet, ARPANET and Internet- History of the World Wide Web, basic Internet Terminology, Net etiquette. Internet Applications.	6
II	Packet switching technology, Internet Protocols: TCP/IP, Router, Internet Addressing Scheme: Machine Addressing (IP address) - Email protocols –SMTP, POP3, IMAp4,MIME6.	6
III	Internet accounts by ISP: Telephone line options, Protocol options, Service options, Telephone line options – Dialup connections through the telephone system, dedicated connections through the telephone system, ISDN – Wireless Connection: Wi-Fi, Hotspot, and Modem	6
IV	Network definition, Common terminologies: LAN, WAN, Node, Host, Workstation, bandwidth, Interoperability, Network administrator, network security, Network Components: Severs, Clients, Communication Media, Types of network: Peer to Peer, Clients Server, Addressing in Internet: DNS, Domain Name and their organization.	6
V	Email Networks and Servers - Structure of an Email – Email Address, Email Header, Body and Attachments - E-mail Addresses – Sending and Receiving E-Mail – Online Education - Social Networking.	6

Text Book(s):

1. Greenlaw R and Hepp E “Fundamentals of Internet and www” 2nd EL, Tata McGrawHill, 2007.
2. Dr.P.Rizwan Ahmed, “Internet and Its Applications”, Margham Publications, 2018.

Reference Book(s):

1. M. L. Young,”The Complete reference to Internet”, Tata McGraw Hill, 2007.
2. B. Patel & Lal B. Barik, ” Internet & Web Technology “, Acme Learning Publishers.

3. Leon and Leon, “Internet for Everyone”, Vikas Publishing House.
Web Resource(s):
1. https://cs50.harvard.edu/x/2023/notes/9/ 2. https://developer.mozilla.org/en-US/docs/Learn_web_development/Howto/Web_mechanics/How_does_the_Internet_work

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO 1	Know the basic concept in internet	K1,K2,K3
CO 2	Know the concept of TCP/IP – Internet Technologies and Protocol	K1,K2,K4
CO 3	Understand the concept of Internet connectivity	K2,K3,K4
CO 4	Know about internet networks	K2,K3,K4,K5
CO 5	Explore various types of internet-based applications, such as email clients, cloud storage solutions, and collaboration tools.	K2,K3,K4,K5

Relationship Matrix:

Course Outcomes (COs)	Program Outcomes (POs)							Program Specific Outcomes(PSOs)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	3	3	3	3	3	3	3	3	2	3	2	3	2.83
CO2	3	2	3	3	3	3	3	3	3	2	3	2	2.75
CO3	3	3	3	3	3	3	3	3	2	3	2	2	2.75
CO4	3	3	3	3	3	3	3	3	2	2	3	3	2.83
CO5	3	3	3	3	3	3	3	3	3	2	2	3	2.83
											Mean Overall Score		2.8
											Correlation		High

3 – Strong, 2- Medium, 1- Low

Mean Overall Score	Correlation
<=1	Low
>1 & <=2	Medium
>2 & <=3	High