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: B.Sc.

Course: Computer Science

Program Outcomes (POs)	
PO Code	**Program Outcome Statement**
PO1	Disciplinary Knowledge : Acquire detailed knowledge and expertise in all the disciplines of the subject
PO2	Communication Skills: Ability to express thoughts and ideas effectively in writing, listening and confidently communicate with others using appropriate media.
PO3	Critical Thinking: Students will develop aptitude , Integrate skills of analysis, critiquing, application and creativity.
PO4	Analytical Reasoning: Familiarize to evaluate the reliability and relevance of evidence, collect, analyze and interpret data.
PO5	Problem Solving: Capacity to extrapolate the learned competencies to solve different kinds of non-familiar problems.
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.

Program Specific Outcomes (POs)	
PSO Code	**Program Specific Outcome Statement**
PSO1	Understand the programming concepts and methodology & the functionality of hardware and software aspects of computer systems.
PSO2	Analyze and formulate ideas for theoretical and practical conceptualization of programming language of the computer domain.
PSO3	Identify complex problems and design sustainable solutions incorporating digital technology to compete with global demand.
PSO4	Analyze the phases of project development and contribute to the design and development of software with technical expertise leading to career advancement
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.

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

Credit Distribution for UG Programmes

Sem I	Credit	H	Sem II	Credit	H	Sem III	Credit	H	Sem IV	Credit	H	Sem V	Credit	H	Sem VI	Credit	H
Part 1. Language – Tamil	3	6	Part..1. Language – Tamil	3	6	Part..1. Language – Tamil	3	6	Part..1. Language – Tamil	3	6	5.1 Core Course –\CC IX	4	5	6.1 Core Course – CC XIII	4	6
Part.2 English	3	6	Part..2 English	3	6	Part..2 English	3	6	Part..2 English	3	6	5.2 Core Course – CC X	4	5	6.2 Core Course – CC XIV	4	6
1.3 Core Course – CC I	5	5	2..3 Core Course – CC III	5	5	3.3 Core Course – CC V	5	5	4.3 Core Course – CC VII Core Industry Module	5	5	5. 3.Core Course CC -XI	4	5	6.3 Core Course – CC XV	4	6
1.4 Core Course – CC II	4	4	2.4 Core Course – CC IV	4	4	3.4 Core Course – CC VI	5	5	4.4 Core Course – CC VIII	5	5	5. 4.Core Course –/ Project with viva-voce CC - XII	4	5	6.4 Elective -VII Generic/ Discipline Specific	3	5
1.5 Elective I Generic/ Discipline Specific	4	5	2.5 Elective II Generic/ Discipline Specific	4	5	3.5 Elective III Generic/ Discipline Specific	3	4	4.5 Elective IV Generic/ Discipline Specific	3	3	5.5 Elective V Generic/ Discipline Specific	3	4	6.5 Elective VIII Generic/ Discipline Specific	3	5
1.6 Skill Enhancement Course SEC-1	2	2	2.6 Skill Enhancement Course SEC-2	2	2	3.6 Skill Enhancement Course SEC-4, (Entrepreneurial Skill)	1	1	4.6 Skill Enhancement Course SEC-6	2	2	5.6 Elective VI Generic/ Discipline Specific	3	4	6.6 Extension Activity	1	-
1.7 Skill Enhancement - (Foundation Course)	2	2	2.7 Skill Enhancement Course – SEC-3	2	2	3.7 Skill Enhancement Course SEC-5	2	2	4.7 Skill Enhancement Course SEC-7	2	2	5.7 Value Education	2	2	6.7 Professional Competency Skill	2	2
						3.8 E.V.S.	-	1	4.8 E.V.S	2	1	5.8 Summer Internship /Industrial Training	2				
	23	**30**		**23**	**30**		**22**	**30**		**25**	**30**		**26**	**30**		**21**	**30**
Total – 140 Credits																	

B .Sc(Computer Science)

Sem	Course Code	Part	Course Category	Course Title	Ins. Hrs/Week	Credit	Marks CIA - ESE		Total
Semester I	URDU - 25BLU10 / TAMIL - 25BLT10	I	Language – I (Tamil / Urdu)	Tamil –I / Urdu - I	6	3	25	75	100
	25BLE10	II	English – I	English –I	6	3	25	75	100
	25BCS11	III	Core – I	CC1- Object Oriented Programming Concepts Using C++	5	5	25	75	100
	25BECS12A	III	Elective – I	a) Numerical Methods - I	5	4	25	75	100
	25BECS12B			b) Discrete Mathematics - I					
	25BSCS13	IV	Skill Enhancement Course (SEC) – I	SEC- 1: Introduction to HTML	2	2	25	75	100
	25BFCS14	IV	Foundation Course (FC)	Problem Solving Technique	2	2	25	75	100
	25BPCS15	III	Core – II	CC2- Practical: Object Oriented Programming Concepts Using C++ Lab	4	4	25	75	100
	Total				**30**	**23**			**700**
Semester II	URDU - 25BLU20 / TAMIL - 25BLT20	I	Language – II (Tamil / Urdu)	Tamil –II / Urdu - II	6	3	25	75	100
	25BLE20	II	English – II	English –II	6	3	25	75	100
	25BCS21	III	Core – III	CC3- Data Structures and Algorithm	5	5	25	75	100
	25BECS22A	IV	Elective – II	a) Numerical Methods – II	5	4	25	75	100
	25BECS22B			b) Discrete Mathematics – II					
	25BSCS23	IV	Skill Enhancement Course(SEC) – II	SEC -2 : Office Automation	2	2	25	75	100
	25BSCS24	IV	Skill Enhancement Course(SEC) – III	SEC-3 : PHP Programming	2	2	25	75	100
	25BPCS25	III	Core – IV	CC4 – Practical : Data Structures and Algorithm Lab	4	4	25	75	100
	Total				**30**	**23**			**700**

Semester I

Semester	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
I	25BCS11	Core – I	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	COs	Cognitive Level	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	CO1	K1	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.	CO2, CO5	K1, K2	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.	CO3	K1, K2	15
IV	Pointers – Declaration – Pointer to Class - this pointer -Arrays- Characteristics – Array of Classes – Dynamic Memory Allocation : new and delete operators – virtual functions.	CO3, CO4	K1,K2, K3	15
V	File – File stream classes – File modes – Sequential Read / write operations – Binary and ASCII Files – Random Access Operations – Templates – Exception Handling	CO5	K1,K2, K3, K4	15

Recommended Text Books:

1. E.Balagurusamy, " Object-Oriented Programming with C++", TMH 2013, 7th Edition.
2. Dr.P.Rizwan Ahmed, "Programming in C++", Margham Publications, 2026
3. John Smily "Learn to Program with C++", 2002, 1st Edition.

Reference Books:

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):

1. https://alison.com/course/introduction-to-c-plus-plus-programming

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
CO2	Understanding the programming principles in C++ (Data types, operators, branching and looping, arrays, functions, structures)	K1, K2
CO3	Apply the programming principles learnt in real time problems	K1, K2
CO4	Analyze the various methods of solving a problem and choose the best methods	K1,K2, K3
CO5	Code, debug and test the programs with appropriate test cases	K1, K2,K3, K4

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	2	3	2	1	1	2	2.0
CO2	3	3	2	2	3	2	2	3	3	2	2	2	2.41
CO3	2	2	3	3	3	3	2	3	3	3	2	3	2.66
CO4	2	2	3	3	3	2	3	2	3	3	3	3	2.66
CO5	3	2	2	2	3	3	3	3	3	3	3	3	2.75
												Mean Overall Score	2.5
												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	25BPCS15	Core – II	4	4	25	75	100
Course Title	**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 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				
S.No	List of Exercise			Hours
1.	Write a C++ program to demonstrate Class and Objects	COs	Cognitive Level	60
2.	Write a C++ program to demonstrate Constructor, copy constructor and Destructor.	CO1 to CO5	K1 to K5	
3.	Write a C++ program to demonstrate function overloading, Default Arguments and Inline function.			
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 pointers and dynamic memory allocation using new and delete operators			
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 implement Single Inheritance			
10.	Write a C++ program to implement Multiple Inheritance			
11.	Write a C++ program to implement Multilevel Inheritance			
12.	Write a C++ program to implement Hierarchical Inheritance			
13.	Write a C++ program to demonstrate Exception Handling.			
14.	Write a C++ program to manipulate a Text File.			
15.	Write a C++ program to perform Sequential I/O Operations on a file.			
16.	Write a C++ program to find the Biggest Number using Command Line Arguments			

Text Book:
1. E.Balagurusamy, " Object-Oriented Programming with C++", TMH 2013, 7th Edition. 2. Dr.P.Rizwan Ahmed, "Programming in C++", Margham Publications, 2026
Reference Books:
1. Ashok N Kamthane, "Object-Oriented Programming with ANSI and Turbo C++",Pearson Education 2003.
Web Resource:
1. www.w3school.com /C++

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
CO2	Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers and files)	K1,K2
CO3	Apply the programming principles learnt in the real-time problems	K1,K2,K3
CO4	Analyze the various methods of solving a problem and choose the best method.	K1,K2,K3,K4,
CO5	Code, debug and test the programs with appropriate test cases	K1,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	2	3	2	1	2	2	2.08
CO2	3	3	2	2	3	2	2	3	3	2	2	2	2.42
CO3	2	2	3	3	3	3	2	3	3	3	2	3	2.67
CO4	2	2	3	3	3	2	3	2	3	3	3	3	2.67
CO5	3	2	2	2	3	3	3	3	3	3	3	3	2.75
												Mean Overall Score	2.52
												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	25BECS12A	Elective - I	5	4	25	75	100
Course Title	**Numerical Methods – I**						

Learning Objectives	
LO1	To understand the principles of least squares and apply them to fit linear, polynomial, and exponential curves to data sets.
LO2	To develop proficiency in solving algebraic and transcendental equations using numerical methods effectively.
LO3	To enable students to solve simultaneous linear equations using direct and iterative techniques efficiently.
LO4	To introduce the concept of interpolation with equal intervals and use Gregory-Newton forward and backward formulas for estimating values.
LO5	To equip students with skills to apply central difference interpolation formulas including Gauss, Stirling, and Bessel methods for accurate estimation.

SYLLABUS

Unit	Contents	Hours
I	**Curve Fitting- Principle of Least square** Fitting of straight line $Y = a\,x + b$, parabola $Y = a\,x^2 + b\,x + c$, exponential curves of forms $Y = a\,x^b$, $Y = a\,e^{bx}$, and $Y = a\,b^x$. Chapter 1 (Section 1.4 to 1.9)	15
II	**Solutions of algebraic and transcendental equations** Bisection method, Iteration method, Regula falsi method and Newton-Raphson's method. Chapter 3 (Section 3.1 to 3.4)	15
III	**Solution of Simultaneous linear equations** Direct method - Gauss elimination method, Gauss-Jordan method, Method of Triangularization. Iterative method– Gauss Jacobi, Gauss Siedel method. Chapter 4 (Section 4.1 to 4.4, and 4.7 to 4.8)	15
IV	**Interpolation with equal intervals** Operators Δ, ∇ and E - relation between them. Gregory-Newton forward and backward interpolation formulas Chapter 5 (Section 5.1, 5.2), Chapter 6 (excluding 6.7)	15
V	**Interpolation with equal intervals** **Central differences formulae** Gauss forward and backward formulae, Stirling's formula and Bessel's formula Chapter 7 (Section 7.3 to 7.6)	15

Text Book(s):
1. P. Kandasamy& K. Thilagavathy, Numerical Methods, S.Chan d& Co.
Reference Book(s):
1. M.K.Venkataraman, Numerical Methods, National publishers **2.** Arumugam,Numerical Methods, Scitech publishers
Web Resource(s):
1. https://www.geeksforgeeks.org/program-for-gauss-siedel-method-computational-mathematics/ 2. https://www.baeldung.com/cs/curve-fitting

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO1	Apply least square methods to fit appropriate curves (linear, quadratic, exponential) to experimental data for analysis and prediction.	K1,K2,K3
CO2	Solve algebraic and transcendental equations using bisection, iteration, regula falsi, and Newton-Raphson methods for engineering applications.	K1,K2,K3
CO3	Compute solutions to systems of linear equations using Gauss elimination, Gauss-Jordan, triangularisation, and iterative methods effectively.	K1,K2,K3,K4
CO4	Perform interpolation using forward and backward Gregory-Newton formulas to estimate intermediate data points accurately.	K2,K3,K4,K5
CO5	Use central difference interpolation techniques such as Gauss forward and backward, Stirling, and Bessel formulas to determine unknown values with precision.	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	3	2	2	1	2	2	2	2	2	2.08
CO2	3	2	2	3	3	2	2	2	2	2	2	2	2.25
CO3	3	1	2	3	3	3	2	3	2	3	2	3	2.5
CO4	3	2	2	2	2	2	1	2	2	2	2	2	2.0
CO5	3	2	2	3	2	3	2	3	2	2	2	3	2.41
											Mean Overall Score		2.25
											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	25BECS12B	Elective – I	5	4	25	75	100
Course Title	**Discrete Mathematics – I**						

Learning Objectives	
LO1	To introduce students to the fundamentals of mathematical logic, including connectives, truth tables, tautologies, and logical implications essential for programming and reasoning.
LO2	To enable students to convert logical expressions into normal forms and validate logical arguments using truth tables.
LO3	To provide an understanding of set theory, set operations, Venn diagrams, Cartesian products, and related concepts.
LO4	To familiarize students with relations, their properties, equivalence relations, and partial ordering, enhancing their analytical and classification skills.
LO5	To introduce algebraic structures like semigroups, monoids with their properties and applications in computer science.

SYLLABUS

Unit	Contents	Hours
I	**Mathematical Logic** Introduction - Statements and Notation, Connectives – Negation, Conjunction, Disjunction, Statement Formulas and Truth Tables, Logical Capabilities of Programming Languages, Conditional and Biconditional, Well-formed Formulas, Tautologies, Equivalence of Formulas, Duality Law,Tautological Implications Chapter 1: Section 1.1 and 1.2 (1.2.1 to 1.2.11)	**15**
II	**Normal Forms** Disjunctive Normal Forms, Conjunctive Normal Forms, Principal Disjunctive Normal Forms, Principal Conjunctive Normal Forms, Validity Using Truth Tables Chapter 1: Section 1.3.1 to 1.3.4 and 1.4.1	**15**
III	**Set Theory** Introduction, Notation, Inclusion and Equality of Sets, The Power Set, Some Operations on Sets, Venn Diagrams, Some Basic Set Identities, The Principle of Specification, Ordered Pairs and n-tuples, Cartesian Products Chapter 2: Section 2.1.1 to 2.1.9	**15**
IV	**Set Theory – Cont.** Relations and Ordering – Relations, Properties of Binary Relations in a Set, Relation Matrix and the Graph of a Relation, Partition and Covering of a Set, Equivalence Relations, Partial Ordering, Partially Ordered Set: Representation and Associated Terminology Chapter 2: Section 2.3.1 to 2.3.5	**15**
V	**Algebraic Structures** Introduction, Algebraic Systems: Definition and Examples, Some Simple Algebraic Systems and General Properties,Semigroups and Monoids: Definitions and Examples, Homomorphism of Semigroups and Monoids, Subsemigroups and Submonoids Chapter 3: Section 3.1.1, 3.1.2 3.2.1 to 3.2.2	**15**

Text Book(s):

1. Discrete Mathematical Structures with applications to computer Science J.P Tremblay and R.P Manohar (Mc.Graw Hill, 1997.)

Reference Book(s):

1. P.R. Vittal,Mathematical Foundations– Margham Publication,Chennai.
2. Discrete Mathematics-Oscar Levin(3rd Edition)

Web Resource(s):

https://www.geeksforgeeks.org/engineering-mathematics/discrete-mathematics-tutorial/

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO1	Analyze statements using connectives, construct truth tables, and determine tautologies and logical implications.	K1,K2,K3
CO2	Convert logical expressions into disjunctive and conjunctive normal forms and test the validity of logical arguments.	K1,K2,K3
CO3	Apply set theory concepts including set operations, identities, and Cartesian products in problem solving.	K2,K3,K4
CO4	Analyze relations, determine their properties, and understand equivalence relations and partially ordered sets.	K2,K3,K4
CO5	Explain algebraic structures such as semigroups, monoids with examples and properties.	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	2	2	2	2	2	2	1	1	1	2.0
CO2	3	3	3	3	2	2	2	1	2	2	2	2	2.5
CO3	3	3	3	3	3	2	2	2	3	3	3	2	2.6
CO4	3	3	2	3	3	2	3	3	2	3	1	1	2.4
CO5	3	3	2	3	2	2	2	3	3	2	3	2	2.5
												Mean Overall Score	2.3
												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	25BSCS13	Skill Enhancement Course- I	2	2	25	75	100
Course Title	**Introduction to HTML (SEC-I)**						

Learning Objectives	
LO1	Understanding the basics of Internet, web, website, web browser, web page and Remembering various HTML tags required to design a webpage.
LO2	Learning the HTML Documents Structures and formatting the web page contents.
LO3	Understanding and Applying various types of Lists, creating Hyperlinks required for the webpage.
LO4	To know about creating tables and aligning Table required for webpage.
LO5	Understanding, Applying and creating Forms and Frames for websites.

SYLLABUS

Unit	Contents	Cognitive Levels	Hours
I	Introduction: Web Basics: What is Internet–Web browsers–What is Webpage –HTML Basics: Understanding tags	K1, K2	6
II	Tags for Document structure(HTML, Head, Body Tag).Block level text elements: Headings-paragraph(<p> tag)–Font-style elements:(bold, italic, font, small, strong, strike, big tags)	K1, K2	6
III	Lists: Types of lists: Ordered, Unordered– Nesting Lists–Other tags: Marquee, HR, BR- Using Images –Creating Hyperlinks.	K1, K2	6
IV	Tables: Creating basic Table, Table elements, Caption–Table and cell Alignment –Row span, Col span–Cell padding.	K1, K2, K3, K6	6
V	Frames: Frameset–Targeted Links–No frame–Forms: Input, Text area, Select, Option.	K1,K2, K3, K6	6

Recommend Text Book:

1. "Mastering HTML5 and CSS3 Made Easy", TeachUComp Inc., 2014.
2. Dr.P.Rizwan Ahmed, Open Source Programming, Margham Publications, Chennai, 2020

Reference Book:

1. Thomas Michaud, "Foundations of Web Design: Introduction to HTML & CSS"

Web Resources:

1. http://www.w3schools.com/html/default.asp
2. www.geeksforgeeks.org/html/html-complete-guide

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO1	Knows the basic concepts of webpage and HTML tags.	K1
CO2	Knows the webpage design concepts, understanding document structures and formatting the contents	K1, K2
CO3	Knows about application of various types of lists, Hyperlink	K1,K2,K3
CO4	Creating and formatting Table and Applying it to a webpage	K1,K2, K3,K6
CO5	Understanding the concepts of Frames and Forms, creating and applying it to a webpage	K1,K2,K3, K6

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	3	3	3	2	2	3	2	2	2	2	2.4
CO2	3	3	2	2	2	2	2	3	3	2	2	2	2.33
CO3	2	2	2	2	3	3	2	3	3	2	2	3	2.42
CO4	2	2	3	3	3	2	2	2	3	3	3	3	2.58
CO5	3	3	2	2	3	3	3	3	3	3	3	3	2.83
Mean Overall Score													2.52
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	25BFCS14	Foundation Course (FC)	2	2	25	75	100
Course Title	**Problem Solving Techniques**						

Learning Objectives	
LO1	Familiarize with writing of algorithms, fundamentals of C and philosophy of problem solving.
LO2	Implement different programming constructs and decomposition of problems into functions.
LO3	Use data flow diagram, Pseudo code to implement solutions.
LO4	Define and use of arrays with simple applications
LO5	Understand about operating system and their uses

SYLLABUS

Unit	Contents	Hours
I	**Introduction**: History, characteristics and limitations of Computer. Hardware/Anatomy of Computer: CPU, Memory, Secondary storage devices, Input Devices and Output devices. **Types of Computers**: PC, Workstation, Minicomputer, Main frame and Supercomputer. **Software**: System software and Application software.	6
II	**Programming Languages:** Machine language, Assembly language, High-level language,4 GL and 5GL-Features of good programming language. Translators: Interpreters and Compilers. **Data:** Data types, Input, Processing of data, Arithmetic Operators, Hierarchy of operations and Output. **Structured Programming: Algorithm:** Features of good algorithm, Benefits and drawbacks of algorithm. **Flowcharts:** Flowchart symbols and types of flowcharts. **Pseudo code**.	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

Recommended Text Book:

1. **Stewart Venit,** "Introduction to Programming: Concepts and Design", Fourth Edition, 2010, Dream Tech Publishers.
2. Dr.P.Rizwan Ahmed, Problem Solving Techniques, Margham Publications, Chennai, 2023

Reference Book:
1. **R.S. Salaria,** " Programming for Problem Solving", First Edition, 2022, AICTE Prescribed Textbook – Aligned with Outcome based Education.
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)
CO1	Study the basic knowledge of Computers and Programming Languages	K1,K2
CO2	Study the data types and arithmetic operations, know about the algorithms. Develop program using flow chart and Pseudocode.	K1, K2
CO3	Determine the various operators, Explain about the structure. Illustrates the concepts of Loops.	K1, K2
CO4	Study about Numeric and Character based data. Understand about Arrays	K1, K2
CO5	Understanding and applying DFD, Illustrate program modules, designing and using files	K1, K2, K3

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	2	2	2	3	2	2	2	2	2.42
CO2	3	3	2	2	2	2	2	3	3	2	2	2	2.33
CO3	3	2	3	2	3	2	2	3	3	3	2	3	2.58
CO4	2	2	3	3	2	3	3	3	2	2	3	2	2.50
CO5	3	3	2	3	3	3	3	3	3	3	3	3	2.92
												Mean Overall Score	2.55
												Correlation	High

3 – Strong, 2- Medium, 1- Low

Mean Overall Score	Correlation
< 1.5	Low
≥ 1.5 and < 2.5	Medium
≥ 2.5 High	High

Semester	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	25BCS21	Core – III	5	5	25	75	100
Course Title	**Data Structures and Algorithm**						

Learning Objectives	
LO1	To understand the concept of ADT's
LO2	To learn linear data structures – List, Stack and Queue
LO3	To Learn Tree Structure and applications of Tree
LO4	To learn the Graph Structure and application
LO5	To understand various searching and sorting techniques and its applications.

SYLLABUS

Unit	Contents	Hours
I	Abstract Data Types (ADTs)- List ADT-array-based implementation- linked list implementation: singly linked lists-circular linked lists- doubly-linked lists - operations-Insertion-Deletion -Applications of lists-Polynomial Addition	15
II	Stack ADT-Operations- Applications- Evaluating arithmetic expressions – Conversion of infix to postfix expression-Queue ADT-Operations- Circular Queue- applications of queues.	15
III	Tree ADT-Binary Tree ADT-expression trees-applications of trees- binary search tree ADT- insertion and deletion operations binary-tree traversals	15
IV	Definition- Representation of Graph-Types of graph-Breadth first traversal – Depth first traversal	15
V	Searching-Linear search-Binary search-Sorting-Bubble sort-Selection sort-Insertion sort-Hashing-Hash functions-Separate chaining-Open Addressing-Rehashing Extendible Hashing	15

Recommended Text Books:

1. 1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", Pearson Education 2014, 4th Edition.
2. Dr.P.Rizwan Ahmed, C++ and Data Structures, Margham Publications, Chennai, 2018
3. ReemaThareja, "Data Structures Using C", Oxford Universities Press 2014, 2nd Edition.

Reference Books:

1. Thomas H.Cormen, Chalesm, E.Leiserson, Ronald L.Rivest, Clifford Stein, "Introduction to Algorithms", McGraw Hill 2009, 3rd Edition.
2. Aho, Hopcroft and Ullman, "Data Structures and Algorithms", Pearson Education 2003

Web Resources:

1. https://www.programiz.com/dsa
2. https://www.geeksforgeeks.org/learn-data-structures-and-algorithms-dsa-tutorial/

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO1	Understand the concept of ADTs, Understanding the concept of Singly and Doubly Linked List and its applications.	K1, K2
CO2	Understanding the Stack and Queue and its operations like Insertion, Deletion etc	K1, K2
CO3	Understanding the concept of Tree structure, binary tree traversal	K1, K2
CO4	Understanding the concepts of Graph structure, its types and graph traversal.	K1, K2
CO5	Applying the Algorithms for solving problems like sorting and searching, insertion and deletion of data.	K, K2, K3

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	1	3	2	2	2	2	2.08
CO2	3	3	2	2	2	3	2	3	3	2	2	2	2.41
CO3	3	2	3	3	3	3	2	3	3	3	2	3	2.75
CO4	3	2	3	3	3	2	3	3	2	3	3	3	2.75
CO5	3	3	3	3	3	3	3	3	3	3	3	3	3.00
												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	Course Code	Course Category	Hours / Week	Credits	Marks for Evaluation		
					CIA	ESE	Total
II	25BPCS25	Core – IV	4	4	25	75	100
Course Title	**Practical : Data Structures and Algorithm Lab**						

Learning Objectives	
LO1	To understand the concept of ADT's
LO2	To learn linear data structures – List, Stack and Queue
LO3	To Learn Tree Structure and applications of Tree
LO4	To learn the Graph Structure and application
LO5	To understand various searching and sorting techniques and its applications.

SYLLABUS

Sl. No	List of Exercise	COs	Cognitive Level	Hours
1.	Write a program to implement the Stack ADT using arrays Linked List.	CO1 to CO5	K1 To K5	60
2.	Write a program to implement the Queue ADT using arrays Linked List.			
3.	Write a program to convert from infix expression to postfix expression			
4.	Write a program to evaluate the postfix expression.			
5.	Write a program to perform the following operations: a) Insert an element into Doubly Linked List. b) Delete an element from Doubly Linked List. c) Search for a key element in a Doubly Linked List			
6.	Write a program to perform the following operations: a) Insert an element into a binary search tree b) Delete an element from binary search tree. c) Pre-order, In-order and Post-order Traversals of binary search tree.			
7,	Write a program to implementation of BFS and DFS for a given graph.			
8.	Write a programs for implementing the following searching methods: a) Linear search b) Binary search.			
9.	Write a programs for implementing the Bubble and Selection sorting methods			
10.	Write a programs for implementing the Insertion sorting method			

Recommended Text Books:
1. 1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", Pearson Education 2014, 4th Edition. 2. ReemaThareja, "Data Structures Using C", Oxford Universities Press 2014, 2nd Edition.
Reference Books:
1. Thomas H.Cormen, Chalesm, E.Leiserson, Ronald L.Rivest, Clifford Stein, "Introduction to Algorithms", McGraw Hill 2009, 3rd Edition. 2. Aho, Hopcroft and Ullman, "Data Structures and Algorithms", Pearson Education 2003
Web Resources:
1. https://www.programiz.com/dsa 2. https://www.geeksforgeeks.org/learn-data-structures-and-algorithms-dsa-tutorial/

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO1	Understand the concept of ADT's	K1, K2, K3, K4, K5
CO2	Understanding and Applying the linear data structures – List, Stack and Queue	K1, K2, K3, K4, K5
CO3	Understanding the Tree Structure and applications of Tree	K1, K2, K3, K4, K5
CO4	Application of Graph Traversal such as BFS and DFS	K1, K2, K3, K4, K5
CO5	Understand various searching and sorting techniques and its applications.	K1, 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	1	3	2	2	2	2	2.08
CO2	3	3	2	2	3	2	2	3	3	2	2	2	2. 41
CO3	3	2	3	3	3	3	2	3	3	3	3	3	2. 83
CO4	3	2	3	3	3	2	3	3	3	3	3	3	2.83
CO5	3	3	3	3	3	3	3	3	3	3	3	3	3.00
												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	25BECS22A	Elective – II	5	4	25	75	100
Course Title	**Numerical Methods – II**						

Learning Objectives	
LO1	To introduce the concept and application of interpolation techniques for equal intervals to estimate unknown data points.
LO2	To develop the ability to perform numerical differentiation using finite difference formulas for practical problems.
LO3	To provide knowledge on applying numerical integration methods to approximate definite integrals.
LO4	To enable students to solve linear difference equations with constant coefficients for discrete systems analysis.
LO5	To equip students with techniques for solving first order ordinary differential equations using various numerical methods effectively.

SYLLABUS		
Unit	Contents	Hours
I	**Unit I:Interpolation with equal intervals** Newton's divided difference formula, Lagrange's Interpolation formula and Inverse Lagrange's Interpolation formula. Chapter 8 (Section 8.5 to 8.8)	15
II	**Unit II: Numerical Differentiation** Derivatives using Newton's Forward and Backward Difference Formulae Derivatives using Stirling's Formula - Derivatives using Divided Difference Formula - Maxima and Minima using the above Formulae. **Chapter9**:Section9.1to9.4&9.6	15
III	**Unit III: Numerical Integration** Trapezoidal Rule-Simpson's One-Third Rule - Simpson's Three-Eighth Rule - Weddle's Rule – Applications. **Chapter9**:Section9.9&9.13to9.15	15
IV	**Unit IV: Difference Equations** Linear Homogenous and Non Homogenous Difference Equation with constant coefficients-particular integrals for a^x, x^m, $\sin kx$, $\cos kx$, $a^x F(x)$. **Chapter10**:Section10.1to10.4&10.6	15
V	**Unit V: Numerical solution of Ordinary Differential Equations (I order only):** Taylor's series method- Picard's method, Euler's Method- Modified Euler's Method – Improved Euler's Method –Runge - Kutta Method (Fourth Order only). Chapter11	15

Recommended Text Books:
1. P. Kandasamy& K. Thilagavathy, Numerical Methods, S.Chan d& Co.
Reference Books:
1.M.K.Venkataraman, Numerical Methods, National publishers 2. Arumugam,Numerical Methods, Scitech publishers
Web Resources:
1.https://ece.uwaterloo.ca/~dwharder/NumericalAnalysis/14IVPs/rk/complete.html 2. https://www.atozmath.com/example/CONM/NumeDiff.aspx

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO1	Apply interpolation formulas such as Newton's divided difference and Lagrange's to estimate values for tabulated functions.	K2, K3, K4
CO2	Calculate numerical derivatives using forward, backward, Stirling, and divided difference formulas for function analysis.	K3, K4
CO3	Evaluate definite integrals using Trapezoidal, Simpson's (1/3 and 3/8), and Weddle's rules for engineering and scientific applications.	K3, K4
CO4	Solve linear difference equations with constant coefficients to analyze discrete time systems.	K2, K3, K4
CO5	Determine solutions of first order ordinary differential equations using Taylor's, Picard's, Euler's, Modified Euler's, Improved Euler's, and Runge-Kutta methods.	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	1	3	3	2	2	1	2	2	2	2	2	2.08
CO2	3	2	3	3	2	3	1	2	2	1	2	2	2.16
CO3	3	2	3	3	3	3	1	3	2	3	2	2	2.5
CO4	3	2	2	3	3	2	1	3	2	3	2	2	2.33
CO5	3	2	3	3	3	3	2	3	2	3	2	3	2.66
											Mean Overall Score		2.35
											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	25BECS22B	Elective – II	5	4	25	75	100
Course Title	**Discrete Mathematics – II**						

Learning Objectives	
LO1	To introduce the fundamental concepts of grammars, languages, and syntax analysis used in computational theory.
LO2	To familiarize students with algebraic structures including groups, subgroups, and homomorphisms.
LO3	To enable learners to understand the theory of lattices and Boolean algebra with their applications in computer science.
LO4	To equip students with techniques to represent and minimize Boolean functions for logic circuit design.
LO5	To provide basic knowledge of graph theory and its relevance in modeling real-life computer science problems.

SYLLABUS

Unit	Contents	Hours
I	**Grammars and Languages:** Discussion of Grammars, Formal Definition of a Language, Notions of Syntax Analysis **Polish Expressions and Their Compilation:**Polish Notation, Conversion of Infix Expressions to Polish Notation Chapter 3: Section 3.1.1. to 3.4.2	15
II	**Groups :** Definitions and Examples, Subgroups and Homomorphisms, Cosets and Lagrange's Theorem, Normal Subgroups, Algebraic Systems with Two Binary Operations Chapter 3: Section 3.5.1. to 3.5.5	15
III	**Lattices and Boolean Algebra** Lattices: Introduction, Lattices as Partially Ordered Sets, Definition and Examples, Some Properties of Lattices, Lattices as Algebraic Systems, Sublattices, Direct Product, and Homomorphism, Some Special Lattices Boolean Algebra: Definition and Examples, Subalgebra, Direct Product, and Homomorphism Chapter 4: Section 4.1.1 to 4.2.2	15
IV	**Boolean Functions** Boolean Forms and Free Boolean Algebras, Values of Boolean Expressions and Boolean Functions, Representation of Boolean Functions, Minimization of Boolean Functions Chapter 4: Section 4.3.1 to 4.4.2	15
V	**Graph Theory** Introduction, Basic Concepts of Graph Theory, Basic Definitions, Paths, Reachability, and Connectedness, Matrix Representation of Graphs, Trees Chapter 5: Section 5.1.1 to5.1.4	15

Recommended Text Books:

1. Discrete Mathematical Structures with applications to computer Science J.P Tremblay and R.P Manohar (Mc.Graw Hill, 1997.)

Reference Books:

1. P.R. Vittal,Mathematical Foundations– Margham Publication,Chennai
2. Discrete Mathematics-Oscar Levin(3rd Edition)

Web Resources:

1. https://cse.poriyaan.in/topic/...-lattices-boolean-algebra
2. https://www.geeksforgeeks.org/graph-data-structure-and-algorithms/

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO1	*Understand the fundamental concepts of grammars and formal languages,* including syntax analysis, and demonstrate the ability to convert infix expressions to Polish notation for use in compiler design and mathematical logic.	K2, K3
CO2	*Apply algebraic structures such as groups and subgroups* to solve problems involving homomorphisms, cosets, Lagrange's theorem, and normal subgroups, including systems with two binary operations.	K3, K4
CO3	*Analyze and construct lattice structures and Boolean algebras,* identifying their properties, substructures, homomorphisms, and special types of lattices.	K2, K3
CO4	*Evaluate and minimize Boolean functions* using Boolean expressions, normal forms, and representations in free Boolean algebras, with practical applications in digital logic and circuit design.	K3, K4, K5
CO5	*Demonstrate understanding of core graph theory concepts* such as graphs, trees, paths, connectedness, and matrix representations, and apply them in solving computational and real-world problems.	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	3	2	3	3	2	2	2	2.33
CO2	3	2	3	3	3	2	3	3	3	3	2	2	2.66
CO3	3	2	3	3	2	3	2	3	3	2	2	2	2.5
CO4	3	2	2	3	2	3	1	2	2	2	2	2	2.16
CO5	3	2	3	3	3	3	2	2	2	3	2	3	2.58
											Mean Overall Score		2.45
											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	25BSCS23	SEC- 2	2	2	25	75	100
Course Title	**Office Automation** (Skill Enhancement course – SEC2)						

Learning Objectives	
LO1	To understand the basics of computer systems and its components.
LO2	To understand and apply the basic concepts of a word processing package.
LO3	To understand and apply the basic concepts of electronic spreadsheet software.
LO4	To understand and apply the basic concepts of database management system.
LO5	To Understand and create a presentation using PowerPoint tool.

SYLLABUS

Unit	Contents	Hours
I	**Introductory concepts:** Memory unit– CPU-Input Devices: Key board, Mouse and Scanner. Output devices: Monitor, Printer. Introduction to Operating systems &its features: LINUX–Windows. Introduction to Programming Languages.	6
II	**Word Processing:** Open, Save and close word document; Editing text – tools, formatting, bullets; Spell Checker - Document Formatting – Paragraph alignment, indentation, headers and footers, numbering; printing the document,	6
III	**Spreadsheets:** Excel– opening, entering text and data, formatting the data, navigating; Formulas– entering, handling and copying; Charts–creating, formatting and printing, analysis tables, preparation of financial statements, introduction to data analytics.	6
IV	**Database Concepts (MS-Access):** The concept of data base management system; Data field, records, and files, Sorting and indexing data; Searching records. Designing queries, and preparing the reports.	6
V	**Power point:** Introduction to Power point - Features – Understanding slide typecasting &viewing slides – creating slide shows. Applying special object – including objects & pictures – Slide transition–Animation effects, audio inclusion, timers.	6

Recommended Text Book:

1. Peter Norton,"Introduction to Computers"–TataMcGraw-Hill.
2. Dr.P.Rizwan Ahmed, Office Automation, Margham Publications, Chennai, 2023.

Reference Book:

1. Jennifer Ackerman Kettel, Guy Hat-Davis, Curt Simmons, "Microsoft 2003", Tata McGrawHill.

Web Resources:

1. https://www.udemy.com/course/office-automation-certificate-course/
2. https://www.javatpoint.com/automation-tools

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO1	Possess the knowledge on the basics of computers and its components	K1
CO2	Gain knowledge on Creating Documents, spreadsheet and presentation.	K1, K2, K3
CO3	Learn the concepts of Database and implement the Query in Database.	K1, K2, K3, K4
CO4	Demonstrate the understanding of different automation tools.	K1, K2
CO5	Utilize the automation tools for documentation, calculation and presentation purpose.	K1, K2, K3, K4, K5, K6

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	1	2	2	2	1	1	1.83
CO2	3	3	3	3	3	3	2	3	2	2	3	3	2.75
CO3	3	3	3	3	3	3	2	3	3	3	2	2	2.75
CO4	2	3	2	2	2	3	3	3	3	3	3	2	2.58
CO5	3	3	2	3	3	3	3	3	3	2	3	3	2. 83
												Mean Overall Score	2.55
												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	25BSCS24	SEC-3	2	2	25	75	100
Course Title	**PHP Programming (**Skill Enhancement Course – SEC 3)						

Learning Objectives	
LO1	To provide the necessary knowledge on basics of PHP.
LO2	To design and develop dynamic, database-driven web applications using PHP version.
LO3	To get an experience on various web application development techniques.
LO4	To learn the necessary concepts for working with the files using PHP.
LO5	To get a knowledge on OOPS with PHP.

SYLLABUS		
Unit	**Contents**	**Hours**
I	Introduction to PHP -Basic Knowledge of websites -Introduction of Dynamic Website - Introduction to PHP -Scope of PHP - XAMPP and WAMP Installation	6
II	PHP Programming Basics - Introduction to PHP - Syntax of PHP - Variable -Understanding Data Types -Using Operators -Using Conditional Statements -If(), else if() and else if condition Statement.	6
III	Switch() Statements - Using the while() Loop -Using the for() Loop PHP Functions. PHP Functions -Creating an Array -Modifying Array Elements . Processing Arrays with Loops – Grouping From Selection with Arrays – Using Array Functions.	6
IV	PHP Advanced Concepts -Reading and Writing Files –Reading Data from a File.	6
V	Managing Sessions and Using Session Variables -Destroying a Session -Storing Data in Cookie - Setting Cookies.	6

Recommended Text Books:

1. Head First PHP & MySQL: A Brain-Friendly Guide- 2009-Lynn mighley and Michael Morrison.
2. The Joy of PHP: A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL- Alan Forbes.
3. Dr.P.Rizwan Ahmed, Open Source Programming, Margham Publications, Chennai, 2020.

Reference Books:

1. PHP: The Complete Reference-Steven Holzner.
2. DT Editorial Services (Author), "*HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery)*", Paperback 2016, 2nd Edition.

Web Resources:

1. Open source digital libraries: PHP Programming
2. https://www.w3schools.com/php/default.asp

Course Outcomes		
Upon successful completion of this course, the student will be able to:		
CO No.	CO Statement	Cognitive Level (K-Level)
CO1	Write PHP scripts to handle HTML forms	K1,K2
CO2	Write regular expressions including modifiers, operators, and meta characters.	K1, K2,K3
CO3	Create PHP Program using the concept of array.	K2, K3,K4
CO4	Create PHP programs that use various PHP library functions	K2,K3,K4,K5
CO5	Manipulate files and directories.	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	3	2	3	2	2	2	2	2.25
CO2	2	2	3	2	2	3	2	2	3	3	3	2	2.42
CO3	3	3	3	3	3	3	2	3	2	3	2	2	2.67
CO4	3	2	3	2	3	3	2	3	2	3	3	3	2.67
CO5	3	2	2	3	3	3	2	3	2	3	3	3	2.67
Mean Overall Score													2.53
Correlation													High

3 – Strong, 2- Medium, 1- Low

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