



**THIRUVALLUVAR UNIVERSITY**  
**SERKKADU, VELLORE-632115**

**B.Sc. SOFTWARE COMPUTER SCIENCE**

**SYLLABUS**

**FROM THE ACADEMIC YEAR**

**2023 – 2024**

**Choice Based Credit System (CBCS), Learning Outcomes Based Curriculum Framework (LOCF) Guideline Based Credit and Hours Distribution System for all UG courses including Lab Hours**

**First Year – Semester-I**

<b>Part</b>	<b>List of Courses</b>	<b>Credit</b>	<b>No. of Hours</b>
Part-1	Language – Tamil	3	6
Part-2	English	3	6
Part-3	<b>Core Courses</b>		
	CC1- OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++	5	5
	CC2- Practical : OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++ LAB	5	5
	<b>Elective Courses:(Choose one from the following list)</b>	3	4
	i. Numerical Methods-I		
ii. Discrete Mathematics- I			
Part-4	<b>Skill Enhancement Course SEC-1:</b> Introduction to HTML	2	2
	<b>Foundation Course:</b> (Discipline / Subject Specific) Problem Solving Technique	2	2
		<b>23</b>	<b>30</b>

# FIRST SEMESTER

## Semester I

### CORE PAPER

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	<b>OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++</b>	Core	5	-	-	-	4	5	25	75	100
<b>Learning Objective</b>											
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										
<b>UNIT</b>	<b>Contents</b>									<b>No. of Hours</b>	
I	Introduction to C++ - key concepts of Object-Oriented Programming – Advantages – Object Oriented Languages – I/O in C++ - C++ Declarations. Control Structures : - Decision Making and Statements : If ..else, jump, goto, break, continue, Switch case statements - Loops in C++ :for, while, do - functions in C++ - inline functions – Function Overloading.									15	
II	Classes and Objects: Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects –friend functions – Overloading member functions – Bit fields and classes – Constructor and destructor with static members.									15	
III	Operator Overloading: Overloading unary, binary operators – Overloading Friend functions –type conversion – Inheritance: Types of									15	

	Inheritance – Single, Multilevel, Multiple, Hierarchal, Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes.	
IV	Pointers – Declaration – Pointer to Class , Object – this pointer – Pointers to derived classes and Base classes – Arrays – Characteristics – array of classes – Memory models – new and delete operators – dynamic object – Binding, Polymorphism and Virtual Functions.	15
V	Files – File stream classes – file modes – Sequential Read / Write operations – Binary and ASCII Files – Random Access Operation – Templates – Exception Handling - String – Declaring and Initializing string objects – String Attributes – Miscellaneous functions.	15
<b>Total</b>		<b>75</b>
<b>Course Outcomes</b>		<b>Programme Outcome</b>
CO	Upon completion of the course the students would be able to:	
1	Remember the program structure of C with its syntax and semantics	PO1, PO6
2	Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers and files)	PO2
3	Apply the programming principles learnt in real-time problems	PO4, PO5
4	Analyze the various methods of solving a problem and choose the best method	PO6
5	Code, debug and test the programs with appropriate test cases	PO3, PO6
<b>Text Book</b>		
1	E. Balagurusamy, “Object-Oriented Programming with C++”, TMH 2013, 7th Edition.	
<b>Reference Books</b>		
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.	
<b>Web Resources</b>		
1.	<a href="https://alison.com/course/introduction-to-c-plus-plus-programming">https://alison.com/course/introduction-to-c-plus-plus-programming</a>	

### Mapping with Programme Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	3	3	3	3	3	3

CO 2	3	3	3	2	3	3
CO 3	3	2	2	2	3	2
CO 4	3	3	3	3	2	3
CO 5	3	2	3	2	3	3
<b>Weight age of course contributed to each PSO</b>	15	13	14	12	14	14

S-Strong-3 M-Medium-2 L-Low-1

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	<b>OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++LAB</b>	Core	-	-	4	-	4	4	25	75	100
<b>Course Objective</b>											
C1	Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects										
C2	Understand dynamic memory management techniques using pointers, constructors, destructors, etc										
C3	Describe the concept of function overloading, operator overloading, virtual functions and polymorphism										
C4	Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming										
C5	Demonstrate the use of various OOPs concepts with the help of programs										
<b>S.No</b>	<b>List of Exercises</b>									<b>No. of Hours</b>	
1	Write a C++ program to demonstrate Class and Objects										
2	Write a C++ program to demonstrate Constructor, copy constructor and										

	Destructor.	60
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 demonstrate: <ul style="list-style-type: none"> <li>• Single Inheritance</li> <li>• Multilevel Inheritance</li> <li>• Multiple Inheritance</li> <li>• Hierarchical Inheritance</li> </ul>	
10	Write a C++ program to demonstrate Virtual Functions.	
11	Write a C++ program to manipulate a Text File.	
12	Write a C++ program to perform Sequential I/O Operations on a file.	
13	Write a C++ program to find the Biggest Number using Command Line Arguments	
14	Write a C++ program to demonstrate Class Template	
15	Write a C++ program to demonstrate Function Template.	
16	Write a C++ program to demonstrate Exception Handling.	
<b>Course Outcomes</b>		
CO	Upon completion of the course the students would be able to:	
1	Remember the program structure of C with its syntax and semantics	PO4, PO5

2	Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers and files)	PO6
3	Apply the programming principles learnt in real-time problems	PO4 , PO5
4	Analyze the various methods of solving a problem and choose the best method	PO6
5	Code, debug and test the programs with appropriate test cases	PO4, PO5
<b>Text Book</b>		
1	E. Balagurusamy, “Object-Oriented Programming with C++”, TMH 2013, 7th Edition.	
<b>Reference Books</b>		
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.	
<b>Web Resources</b>		
1.	<a href="https://alison.com/course/introduction-to-c-plus-plus-programming">https://alison.com/course/introduction-to-c-plus-plus-programming</a>	

**Mapping with Programme Outcomes:**

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	3	3	3	3	3	3
CO 2	3	2	3	3	2	3
CO 3	3	3	3	3	3	3
CO 4	3	2	2	3	3	3
CO 5	3	2	3	3	3	2
<b>Weightage of course contributed to each PSO</b>	15	12	14	15	14	14

S-Strong-3 M-Medium-2 L-Low-1

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst.	Marks	Subject Code
	<b>INTRODUCTION TO HTML</b>	Skill Enha . Course (SEC)	2	-	-		2	25	75	100
<b>Learning Objectives</b>										
LO1	Insert a graphic within a web page.									
LO2	Create a link within a web page.									
LO3	Create a table within a web page.									
LO4	Insert heading levels within a web page.									
LO5	Insert ordered and unordered lists within a web page. Create a web page.									
UNIT	Contents									No. Of. Hours
I	Introduction: Web Basics: What is Internet–Web browsers–What is Webpage –HTML Basics: Understanding tags.									6
II	TagsforDocumentstructure(HTML,Head,BodyTag).Blockleveltextelements :Headings-paragraph(<p> tag)–Font-style elements:(bold, italic, font, small, strong, strike, big tags)									6
III	Lists: Types of lists: Ordered, Unordered– Nesting Lists–Other tags: Marquee, HR, BR- Using Images –Creating Hyper-links.									6
IV	Tables: Creating basic Table, Table elements, Caption–Table and cell alignment–Row span, Col span–Cellpadding.									6
V	Frames: Frameset–Targeted Links–No frame–Forms: Input, Text area, Select, Option.									6
<b>TOTAL HOURS</b>									<b>30</b>	
Course Outcomes								Programme Outcomes		
CO	On completion of this course, students will									
CO 1	Knows the basic concept in HTML Concept of resources in HTML									PO1, PO2, PO3, PO4, PO5, PO6
CO 2	Knows Design concept. Concept of Meta Data Understand the concept of save the files.									PO1, PO2, PO3, PO4, PO5, PO6
CO 3	Understand the page formatting. Concept of list									PO1, PO2, PO3, PO4, PO5, PO6
CO 4	Creating Links. Know the concept of creating link to email address									PO1, PO2, PO3, PO4, PO5, PO6
CO 5	Concept of adding images Understand the table creation.									PO1, PO2, PO3, PO4, PO5, PO6



<b>Textbooks</b>	
1	“Mastering HTML5 and CSS3 Made Easy”, TeachUComp Inc., 2014.
2	<b>Thomas Michaud, “Foundations of Web Design: Introduction to HTML &amp; CSS”</b>
<b>Web Resources</b>	
1	<a href="https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf">https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf</a>
2	<a href="https://www.w3schools.com/html/default.asp">https://www.w3schools.com/html/default.asp</a>

**Mapping with Programme Outcomes:**

<b>CO/PSO</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>	<b>PSO 6</b>
<b>CO 1</b>	3	3	3	3	3	3
<b>CO 2</b>	3	3	2	3	3	3
<b>CO 3</b>	2	3	3	3	3	3
<b>CO 4</b>	3	3	3	3	3	3
<b>CO 5</b>	3	3	3	2	3	3
<b>Weightage of course contributed to each PSO</b>	14	15	14	14	15	15

**S-Strong-3    M-Medium-2    L-Low-1**

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
FC	Problem Solving Techniques	FC	2	-	-	-	2	2	25	75	100
<b>Learning Objectives</b>											
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										
UNIT	Contents								No. Of. Hours		
I	<b>Introduction:</b> 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. <b>Programming Languages:</b> Machine language, Assembly language, High-level language, 4GL and 5GL-Features of good programming language. Translators: Interpreters and Compilers.								<b>6</b>		
II	<b>Data:</b> Data types, Input, Processing of data, Arithmetic Operators, Hierarchy of operations and Output. Different phases in Program Development Cycle (PDC). <b>Structured Programming: Algorithm:</b> Features of good algorithm, Benefits and drawbacks of algorithm. <b>Flowcharts:</b> Advantages and limitations of flowcharts, when to use flowcharts, flowchart symbols and types of flowcharts. <b>Pseudocode:</b> Writing a pseudocode. Coding, documenting and testing a program: Comment lines and types of errors. <b>Program design:</b> Modular Programming.								<b>6</b>		
III	<b>Selection Structures:</b> Relational and Logical Operators - Selecting from Several Alternatives – Applications of Selection Structures. <b>Repetition Structures:</b> Counter Controlled Loops –Nested Loops– Applications of Repetition Structures.								<b>6</b>		
IV	<b>Data:</b> Numeric Data and Character Based Data. <b>Arrays:</b> One Dimensional Array - Two Dimensional Arrays – Strings as Arrays of Characters.								<b>6</b>		

V	<b>Data Flow Diagrams:</b> Definition, DFD symbols and types of DFDs. <b>Program Modules:</b> Subprograms-Value and Reference parameters- Scope of a variable - Functions – Recursion. <b>Files:</b> File Basics-Creating and reading a sequential file- Modifying Sequential Files.	<b>6</b>
<b>TOTAL HOURS</b>		<b>30</b>
<b>Course Outcomes</b>		<b>Programme Outcomes</b>
CO	On completion of this course, students will	
CO1	Study the basic knowledge of Computers. Analyze the programming languages.	PO1, PO2, PO3, PO4, PO5, PO6
CO2	Study the data types and arithmetic operations. Know about the algorithms. Develop program using flow chart and pseudocode.	PO1, PO2, PO3, PO4, PO5, PO6
CO3	Determine the various operators. Explain about the structures. Illustrate the concept of Loops	PO1, PO2, PO3, PO4, PO5, PO6
CO4	Study about Numeric data and character-based data. Analyze about Arrays.	PO1, PO2, PO3, PO4, PO5, PO6
CO5	Explain about DFD Illustrate program modules. Creating and reading Files	PO1, PO2, PO3, PO4, PO5, PO6
<b>Textbooks</b>		
1	<b>Stewart Venit</b> , “Introduction to Programming: Concepts and Design”, Fourth Edition, 2010, Dream Tech Publishers.	
<b>Web Resources</b>		
1.	<a href="https://www.codesansar.com/computer-basics/problem-solving-using-computer.htm">https://www.codesansar.com/computer-basics/problem-solving-using-computer.htm</a>	
2.	<a href="http://www.nptel.iitm.ac.in/video.php?subjectId=106102067">http://www.nptel.iitm.ac.in/video.php?subjectId=106102067</a>	
3.	<a href="http://utubersity.com/?page_id=876">http://utubersity.com/?page_id=876</a>	

#### Mapping with Programme Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	3	3	3	3	3	3
CO 2	3	3	3	3	3	3
CO 3	3	2	3	3	3	3
CO 4	3	3	2	3	3	3
CO 5	3	3	3	3	3	2
<b>Weightage of course contributed to each PSO</b>	15	14	14	15	15	14

S-Strong-3    M-Medium-2    L-Low-1

