Annexure - I

Government Arts College (Autonomous), Kumbakonam

Course Structure under CBCS for Science (2023 – 2024 Onwards)

UG – Computer Science (B.Sc)

SEM	Part	Subject Code	Course	Credit	Ins. Hours	Marks		Total
						Int	Ext	
I	I		LC: Part I Tamil Paper I	3	6	25	75	100
	II		ELC: Part II English Paper I	3	6	25	75	100
	III	23U1CS1	CC-I: Object Oriented programming using C++	5	5	25	75	100
		23U1CSP1	CP-I: LAB-I:Object Oriented Programming using C++	3	3	40	60	100
			AC-I: Applied Mathematics -I	4	4	25	75	100
			AC-II: Applied Mathematics - II	--	2	--	--	--
	IV		VE: Value Education	2	2	25	75	100
		23U1CSFC	FC: Foundation course – Problem Solving Techniques	2	2	25	75	100
			Total	**22**	**30**	**Total Marks**		**700**
II	I		LC: Part I Tamil Paper II	3	6	25	75	100
	II		ELC: Part II English Paper II	3	6	25	75	100
	III	23U2CS2	CC-II: Java Programming	5	5	25	75	100
		23U2CSP2	CP-II: LAB-II: Java programming	3	3	40	60	100
			AC-II: Applied Mathematics - II	3	3	25	75	100
			AC-III: Applied Mathematics - III	3	3	25	75	100
	IV		ES: Environmental Studies	2	2	25	75	100
		23U2CSSEC1	SEC-I: Naan Mudhalavan / Office Automation	2	2	25	75	100
			Total	**24**	**30**	**Total Marks**		**800**
III	I		LC: Part I Tamil Paper III	3	6	25	75	100
	II		ELC: Part II English Paper III	3	6	25	75	100
	III	23U3CS3	CC-III: Python Programming	5	5	25	75	100
		23U3CSP3	CP-III: LAB-III: Python programming	3	3	40	60	100
			AC-IV: Applied Physics –I	4	4	25	75	100
			AP-V: LAB - Applied Physics Practical	--	2	--	--	--
	IV	23U3CSSEC2	SEC-II: PHP Programming	2	2	25	75	100
		23U3CSSEC3	SEC-III: Naan Mudhalvan / Understanding Internet	2	2	25	75	100
			Total	**22**	**30**	**Total Marks**		**700**

IV	I		LC: Part I Tamil Paper IV	3	6	25	75	100
	II		ELC: Part II English Paper IV	3	6	25	75	100
	III	23U4CS4	CC-IV: Microprocessors and Microcontroller	5	5	25	75	100
		23U4CSP4	CP-IV:LAB-IV: Microprocessor and Microcontroller	3	3	40	60	100
			AC-V: Applied Physics II	4	4	25	75	100
			AP-VI: LAB - Applied Physics Practical	2	2	40	60	100
	IV		SEC-IV: Soft Skills Development	2	2	25	75	100
		23U4CSSEC5	SEC-V: Naan Mudhalvan / Introduction to HTML	2	2	25	75	100
			Total	**24**	**30**	**Total Marks**		**800**
V	III	23U5CS5	CC-V: Computer Networks	5	5	25	75	100
		23U5CS6	CC-VI: Database Management system	4	5	25	75	100
		23U5CS7	CC-VII: Operating system	4	4	25	75	100
		23U5CSP5	CP-V:LAB-V: Database Management system	3	6	40	60	100
		23U5CSMBE1	MBE-I: Date Structures and algorithms	3	4	25	75	100
		23U5CSMBE2	MBE-II: Data Mining and warehousing	3	4	25	75	100
	IV	23U5CSSEC6	SEC-VI: Naan Mudhalvan / Web Designing	2	2	25	75	100
			Internship / Industrial visit / Field visit	2	-	-	-	-
			Total	**26**	**30**	**Total Marks**		**700**
VI	III	23U6CS8	CC-VIII: Software Engineering	5	6	25	75	100
		23U6CS9	CC-IX: .NET Programming	4	5	25	75	100
		23U6CSP6	CP-VI: LAB-VI: .NET programming	3	5	40	60	100
		23U6CSMBE3	MBE-III: Computer Graphics	3	5	25	75	100
		23U6CSMBE4	MBE-IV: Cloud computing	3	5	25	75	100
	IV	23U6CSSEC7	SEC-VII: Naan Mudhalvan / Advanced Excel	2	2	25	75	100
			Extension Activity	1	--	--	--	--
	V		Gender Studies	1	2	25	75	100
			Total	**22**	**30**	**Total Marks**		**700**
			Net Total	**140**	**180**	**Net Total Marks**		**4400**

COURSE PATTERN – SUMMARY			
PART	**SUBJECT**	**TOTAL PAPERS**	**CREDITS**
I	Tamil	4	12
II	English	4	12
III	Core Course	9	42
	Core Practical	6	18
	Allied Course	5	18
	Allied Practical	1	2
	Major based Elective course	4	12
IV	Foundation Course FC	1	2
	Skill Enhancement course SEC	7	14

	Environmental studies	1	2
	Value Education	1	2
	Internship/Industrial visit/Field visit	--	2
	Extension Activity	--	1
	Naan Mudhalvan	--	--
V	Gender Studies	1	1
	Net Total	**44**	**140**

Subject Code	**Subject Name**	**Category**	**L**	**T**	**P**	**S**	**Credits**	**Inst. Hours**	**Marks**		
									CIA	**External**	**Total**
23U1CS1											
CC I	**OBJECT ORIENTED PROGRAMMING USING C++**	Core	5	-	-	-	5	5	25	75	100

Learning Objective	
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

UNIT	**Contents**	**No. of Hours**
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 variablesand functions – array of objects –friend functions – Overloading member functions – Bit fieldsand classes – Constructor and destructor with static members.	15
III	Operator Overloading: Overloading unary, binary operators – Overloading Friend functions –type conversion – Inheritance: Types of Inheritance – Single, Multilevel,	15

	Multiple, Hierarchal,Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes.	
IV	Pointers – Declaration – Pointer to Class , Object – this pointer – Pointers to derived classes andBase classes – Arrays – Characteristics – array of classes – Memory models – new and deleteoperators – dynamic object – Binding, Polymorphism and Virtual Functions.	15
V	Files – File stream classes – file modes – Sequential Read / Write operations – Binary and ASCIIFiles – Random Access Operation – Templates – Exception Handling - String – Declaring andInitializing string objects – String Attributes – Miscellaneous functions.	15
	Total	**75**

Course Outcomes		**Programme Outcome**
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
Text Book		
1	E. Balagurusamy, “Object-Oriented Programming with C++”, TMH 2013, 7th 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 Resources		
1.	https://alison.com/course/introduction-to-c-plus-plus-programming	

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
Weightage of course contributed to each PSO	15	13	14	12	14	14

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

Subject Code 23U1CSP1	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
CP I	**LAB-I: OBJECT ORIENTED PROGRAMMING USING C++**	Core	-	-	3	-	3	3	40	60	100

Course Objective	
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

S.No	**List of Excercises**	**No. of Hours**
1	Write a C++ program to demonstrate function overloading, Default Arguments and Inline function.	60
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 Constructor and Destructor	
6	Write a C++ program to demonstrate Unary Operator Overloading	
7	Write a C++ program to demonstrate Binary Operator Overloading	
8	Write a C++ program to demonstrate: • Single Inheritance • Multilevel Inheritance • Multiple Inheritance • Hierarchical Inheritance • Hybrid Inheritance	
9	Write a C++ program to demonstrate Virtual Functions.	
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.	

Course Outcomes		Programme Outcome
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

Text Book	
1	E. Balagurusamy, "Object-Oriented Programming with C++", TMH 2013, 7th 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 Resources	
1.	https://alison.com/course/introduction-to-c-plus-plus-programming

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
Weightage of course contributed to each PSO	15	12	14	15	14	14

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

Subject Code 23U1CSFC	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
FC	FOUNDATION COURSE - PROBLEM SOLVING TECHNIQUES	FC	2	-	-	-	2	2	25	75	100

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

UNIT	Contents	No. Of. 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. **Programming Languages:** Machine language, Assembly language, High-level language,4 GL and 5GL - Features of good programming language. Translators: Interpreters and Compilers.	**6**
II	**Data:** Data types, Input, Processing of data, Arithmetic Operators, Hierarchy of operations and Output. Different phases in Program Development Cycle (PDC).**Structured Programming: Algorithm:** Features of good algorithm, Benefits and drawbacks of algorithm. **Flowcharts:** Advantages and limitations of flowcharts, when to use flowcharts, flowchart symbols and types of flowcharts. **Pseudocode:** Writing a pseudocode. Coding, documenting and testing a program: Comment lines and types of errors. **Program design:** Modular Programming.	**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**
	TOTAL HOURS	**30**

Course Outcomes		Programme Outcomes
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
Textbooks		
1	**Stewart Venit,** "Introduction to Programming: Concepts and Design", Fourth Edition, 2010, Dream Tech Publishers.	
Web Resources		
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	

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
Weightage of course contributed to each PSO	15	14	14	15	15	14

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

Subject Code 23U2CS2	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	Ext	Total
CC II	**JAVA PROGRAMMING**	Core	5	-	-	-	5	5	25	75	100

Learning Objectives

LO1	To provide fundamental knowledge of object-oriented programming
LO2	To equip the student with programming knowledge in Core Java from the basics up.
LO3	To enable the students to use AWT controls, Event Handling and Swing for GUI.
LO4	To provide fundamental knowledge of object-oriented programming.
LO5	To equip the student with programming knowledge in Core Java from the basics up.

UNIT	Contents	No. of Hours
I	**Introduction:**ReviewofObjectOrientedconcepts - HistoryofJava - Javabuzzwords - JVMarchitecture - Datatypes - Variables - Scope and life timeofvariables - arrays - operators - controlstatements - type conversion and casting - simple java program - constructors - methods - Static block - Static Data - StaticMethodStringandStringBufferClasses.	15
II	**Inheritance**: Basic concepts - Types of inheritance - Member access rules - Usage of this and Super key word - Method Overloading - Method overriding - Abstract classes - Dynamic method dispatch - Usage of final keyword. **Packages**:Definition-AccessProtection -ImportingPackages. **Interfaces**:Definition–Implementation–Extending Interfaces. **Exception Handling**: *try – catch- throw - throws – finally* – Built-inexceptions - Creating own Exception classes.	15
III	**Multithreaded Programming**: Thread Class - Runnable interface – Synchronization–Using synchronizedmethods– Using synchronized statement-InterthreadCommunication –Deadlock. **I/O Streams:** Concepts of streams - Stream classes- Byte and Character stream - Reading console Input and Writing Console output - File Handling.	15
IV	**AWT Controls:** The AWT class hierarchy - user interface components- Labels - Button - Text Components - Check Box - Check Box Group - Choice - List Box - Panels – Scroll Pane - Menu - Scroll Bar. Working with Frame class - Colour - Fonts and layout managers. **Event Handling:** Events - Event sources - Event Listeners - Event Delegation Model (EDM) - Handling Mouse and Keyboard Events - Adapter classes - Inner classes	15
V	**Swing:** Introduction to Swing - Hierarchy of swing components. Containers - Top level containers - JFrame - JWindow - JDialog - JPanel - JButton - JToggleButton - JCheckBox - JRadioButton - JLabel,JTextField - JTextArea - JList - JComboBox - JScrollPane.	15
	Total	**75**

Course Outcomes		
Course Outcomes	On completion of this course, students will;	
CO1	Understand the basic Object-oriented concepts.Implement the basic constructs of Core Java.	PO1, PO2, PO6
CO2	Implement inheritance, packages, interfaces and exception handling of Core Java.	PO2, PO3, PO8
CO3	Implement multi-threading and I/O Streams of Core Java	PO1, PO3, PO5
CO4	Implement AWT and Event handling.	PO2, PO6
CO5	Use Swing to create GUI.	PO1, PO3, PO6

Text Books:

1.	Herbert Schildt, The Complete Reference, Tata McGraw Hill, New Delhi, 7th Edition, 2010
2.	Gary Cornell, *Core Java 2 Volume I – Fundamentals,* Addison Wesley, 1999

References :

1.	Head First Java, O'Rielly Publications,
2.	Y. Daniel Liang, *Introduction to Java Programming*, 7th Edition, Pearson Education India, 2010

Web Resources

1.	https://javabeginnerstutorial.com/core-java-tutorial
2.	http://docs.oracle.com/javase/tutorial/
3.	https://www.coursera.org/

Mapping with Programme Outcomes:

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	3	3	3	3	2
CO2	3	3	3	2	2	3
CO3	2	2	1	3	3	3
CO4	3	3	3	3	3	2
CO5	3	3	3	3	3	1
Weightage of course contributed to each PSO	14	14	13	14	14	11

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

Subject Code 23U2CSP2	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
CP II	LAB-II: JAVA PROGRAMMING	Core	-	-	3	-	3	3	40	60	100

Learning Objectives	
LO1	To provide fundamental knowledge of object-oriented programming.
LO2	To equip the student with programming knowledge in Core Java from the basics up.
LO3	To enable the students to know about Event Handling .
LO4	To enable the students to use String Concepts.
LO5	To equip the student with programming knowledge in to creat GUI using AWT controls.

EXCERCISE	Details
1	Write a Java program that prompts the user for an integer and then prints out all the prime numbers up to that Integer
2	Write a Java program to multiply two given matrices.
3	Write a Java program that displays the number of characters, lines and words in a text
4	Generate random numbers between two given limits using Random class and print messages according to the range of the value generated.
5	Write a program to do String Manipulation using CharacterArray and perform the following string operations: a. String length b. Finding a character at a particular position c. Concatenating two strings
6	Write a program to perform the following string operations using String class: a. String Concatenation b. Search a substring c. To extract substring from given string
7	Write a program to perform string operations using String Buffer class: a. Length of a string b. Reverse a string c. Delete a substring from the given string
8	Write a java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number.
9	Write a threading program which uses the same method asynchronously to print the numbers 1to10 using Thread1 and to print 90 to100 using Thread2.

10	Write a program to demonstrate the use of following exceptions. a. Arithmetic Exception b. Number Format Exception c. ArrayIndexOutofBoundException d. NegativeArraySizeException	
11	Write a Java program that reads on file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes	60
12	Write a program to accept a text and change its size and font. Include bold italic options. Use frames and controls.	
13	Write a Java program that handles all mouse events and shows the event name at the center of the window when a mouse event is fired. (Use adapter classes).	
14	Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result. Handle any possible exceptions like divide by zero.	
15	Write a Java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green with radio buttons. On selecting a button, an appropriate message with "stop" or "ready" or "go" should appear above the buttons in a selected color. Initially there is no message shown.	
	Total	**60**

Course Outcomes		**Programme Outcome**
CO	On completion of this course, students will	
1	Understand the basic Object-oriented concepts.Implement the basic constructs of Core Java.	PO1
2	Implement inheritance, packages, interfaces and exception handling of Core Java.	PO1, PO2
3	Implement multi-threading and I/O Streams of Core Java	PO4, PO6
4	Implement AWT and Event handling.	PO4, PO5, PO6
5	Use Swing to create GUI.	PO3, PO6

Text Book

1	Herbert Schildt, The Complete Reference, Tata McGraw Hill, New Delhi, 7th Edition, 2010.
2.	Gary Cornell, *Core Java 2 Volume I – Fundamentals,* Addison Wesley, 1999.

Reference Books

1.	Head First Java, O'Rielly Publications,
2.	Y. Daniel Liang, *Introduction to Java Programming*, 7th Edition, Pearson Education India, 2010.

Web Resources

1.	https://www.w3schools.com/java/
2.	http://java.sun.com
3.	http://www.afu.com/javafaq.html

Mapping with Programme Outcomes:

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	3	3	3	3	2
CO2	3	3	3	2	2	3
CO3	2	2	1	3	3	3
CO4	3	3	3	3	3	2
CO5	3	3	3	3	3	2
Weightage of course	14	14	13	14	14	12

S-Strong M-Medium L-Low

Subject Code 23U2CSSEC1	Subject Name	Category	L	T	P	S	Credits		Marks		
									CIA	External	Total
SEC-I	**NAAN MUDHALVAN / OFFICE AUTOMATION**	SEC	**2**	-	-	-	2		25	75	100

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

UNIT	**Contents**	**No. of Hours**
I	**Introductory concepts**: Memory unit – CPU - Input Devices: Key board, Mouse and Scanner. Output devices: Monitor, Printer. Introduction to Operating systems & its features: DOS– UNIX–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–Preview, options, merge.	6
III	**Spreadsheets:** Excel–opening, entering text and data, formatting, navigating; Formulas – entering, handling and copying; Charts–creating, formatting and printing, analysistables, preparation of financial statements, introduction to data analytics.	6
IV	**Database Concepts:** The concept of data base management system; Data field, records, and files, Sorting and indexing data; Searching records. Designing queries, and reports; Linking of datafiles; Understanding Programming environment in DBMS; Developing menu drive applications in query language (MS–Access).	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
	Total	**30**

Course Outcomes		**Programme Outcomes**
CO	On completion of this course, students will	
CO1	Possess the knowledge on the basics of computers and its components	PO1,PO2,PO3,PO6,PO8
CO2	Gain knowledge on Creating Documents, spreadsheet and presentation.	PO1,PO2,PO3,PO6
CO3	Learn the concepts of Database and implement the Query in Database.	PO3,PO5,PO7
CO4	Demonstrate the understanding of different automation tools.	PO3,PO4,PO5,PO7

CO5	Utilize the automation tools for documentation, calculation and presentation purpose.	PO4,PO6,PO7,PO8
Text Book		
1	PeterNorton,"Introduction to Computers"–TataMcGraw-Hill.	
Reference Books		
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	

Mapping with Programme Outcomes:

MAPPING TABLE						
CO/ PSO	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**	**PSO 6**
CO1	**3**	**2**	**2**	**3**	**3**	**3**
CO2	**3**	**3**	**3**	**3**	**3**	**3**
CO3	**3**	**3**	**3**	**3**	**3**	**3**
CO4	**3**	**3**	**3**	**3**	**3**	**3**
CO5	**3**	**3**	**3**	**3**	**3**	**3**
Weightage of course contributed to each PSO	**15**	**14**	**14**	**15**	**15**	**15**

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

Subject Code 23U3CS3	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
CC-III	PYTHON PROGRAMMING	Core	5	-	-	-	5	25	75	100

Learning Objectives	
LO1	To make students understand the concepts of Python programming.
LO2	To apply the OOPs concept in PYTHON programming.
LO3	To impart knowledge on demand and supply concepts
LO4	To make the students learn best practices in PYTHON programming
LO5	To know the costs and profit maximization

UNIT	Contents	No. of Hours
I	**Basics of Python Programming:** History of Python-Features of Python-Literal-Constants-Variables - Identifiers–Keywords-Built-in Data Types-Output Statements – Input Statements-Comments – Indentation-Operators-Expressions-Type conversions.	**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, Keyword Arguments, Default Arguments and Variable Length Arguments-Recursion. **Python Strings:** String operations- Immutable Strings - Built-in String Methods and Functions - String Comparison. **Modules**: import statement- The Python module – dir() function – Modules and Namespace – Defining our own modules.	**15**
IV	**Lists:** Creating a list -Access values in List-Updating values in Lists-Nested lists -Basic list operations-List Methods. **Tuples**: Creating, Accessing, Updating and Deleting Elements in a tuple – Nested tuples– Difference between lists and tuples. **Dictionaries:** Creating, Accessing, Updating and Deleting Elements in a Dictionary – Dictionary Functions and Methods - Difference between Lists and Dictionaries.	**15**
V	**Python File Handling:** Types of files in Python - Opening and Closing files-Reading and Writing files: write() and writelines() methods- append() method – read() and readlines() methods – with keyword – Splitting words – File methods - File Positions- Renaming and deleting files.	**15**
	TOTAL HOURS	**75**

Course Outcomes	Programme Outcomes

CO	On completion of this course, students will	
CO1	Learn the basics of python, Do simple programs on python, Learn how to use an array.	PO1, PO2, PO3, PO4, PO5, PO6
CO2	Develop program using selection statement, Work with Looping and jump statements, Do programs on Loops and jump statements.	PO1, PO2, PO3, PO4, PO5, PO6
CO3	Concept of function, function arguments, Implementing the concept strings in various application, Significance of Modules, Work with functions, Strings and modules.	PO1, PO2, PO3, PO4, PO5, PO6
CO4	Work with List, tuples and dictionary, Write program using list, tuples and dictionary.	PO1, PO2, PO3, PO4, PO5, PO6
CO5	Usage of File handlings in python, Concept of reading and writing files, Do programs using files.	PO1, PO2, PO3, PO4, PO5, PO6
Textbooks		
1	ReemaThareja, "Python Programming using problem solving approach", First Edition, 2017, Oxford University Press.	
2	Dr. R. NageswaraRao, "Core Python Programming", First Edition, 2017, Dream tech Publishers.	
Reference Books		
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", APress.	
5.	Kenneth A. Lambert, "Fundamentals of Python – First Programs", CENGAGE Publication.	
Web Resources		
1.	https://www.programiz.com/python-programming	
2.	https://www.guru99.com/python-tutorials.html	
3.	https://www.w3schools.com/python/python_intro.asp	
4.	https://www.geeksforgeeks.org/python-programming-language/	
5.	https://en.wikipedia.org/wiki/Python_(programming_language)	

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	2	3
CO 3	3	3	3	3	2	2
CO 4	3	3	3	3	2	3
CO 5	3	2	3	3	3	3
Weightage of course contributed to each PSO	15	14	15	15	13	14

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

Subject Code 23U3CSP3	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
CP-III	**LAB-III: PYTHON PROGRAMMING**	**Core**	-	-	3	-	3	**40**	**60**	**100**

Learning Objectives	
LO1	Be able to design and program Python applications.
LO2	Be able to create loops and decision statements in Python.
LO3	Be able to work with functions and pass arguments in Python.
LO4	Be able to build and package Python modules for reusability.
LO5	Be able to read and write files in Python.

LAB EXERCISES	**Required Hours**
1. Program using variables, constants, I/O statements in Python. 2. Program using Operators in Python. 3. Program using Conditional Statements. 4. Program using Loops. 5. Program using Jump Statements. 6. Program using Functions. 7. Program using Recursion. 8. Program using Strings. 9. Program using Modules. 10. Program using Lists. 11. Program using Tuples. 12. Program using Dictionaries. 13. Program for File Handling.	**60**

Course Outcomes	
On completion of this course, students will	
CO1	Demonstrate the understanding of syntax and semantics of PYTHON language
CO2	Identify the problem and solve using PYTHON programming techniques.
CO3	Identify suitable programming constructs for problem solving.
CO4	Analyze various concepts of PYTHON language to solve the problem in an efficient way.
CO5	Develop a PYTHON program for a given problem and test for its correctness.

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	1	3	2	3
CO 3	3	3	3	3	2	2
CO 4	3	3	3	3	2	3
CO 5	3	2	3	3	3	3
Weightage of course contributed to each PSO	15	15	13	15	13	14

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

Subject Code 23U3CSSEC2	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
SEC-II	PHP PROGRAMMING	SEC	2	-	-	-	2	25	75	100

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.

UNIT	Contents	No. of 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 -Syntax of PHP -Embedding PHP in HTML -Embedding HTML in PHP. Introduction to 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 Form Selections 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 Cookies -Setting Cookies.	6
	Total	**30**

Course Outcomes		Programme Outcomes
CO	On completion of this course, students will	
CO1	Write PHP scripts to handle HTML forms	PO1,PO4,PO6
CO2	Write regular expressions including modifiers, operators, and metacharacters.	PO2,PO5,PO7.
CO3	Create PHP Program using the concept of array.	PO3,PO4,PO5.
CO4	Create PHP programs that use various PHP library functions	PO2,PO3,PO5
CO5	Manipulate files and directories.	PO3,PO5,PO6.

Text Book	
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

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.	Opensource digital libraries: PHP Programming
2.	https://www.w3schools.com/php/default.asp

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	2	3
CO 3	3	3	3	3	2	2
CO 4	3	3	3	3	2	3
CO 5	3	2	3	3	3	3
Weightage of course contributed to each PSO	15	14	15	15	13	14

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

Subject Code 23U3CSSEC3	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
SEC-III	NAAN MUDHALVAN / UNDERSTANDING INTERNET	SEC	2	-	-		2	25	75	100

Learning Objectives	
LO1	Knowledge of Internet medium
LO2	Internet as a mass medium
LO3	Features of Internet Technology,
LO4	Internet as source of infotainment
LO5	Study of internet audiences and about cyber crime

UNIT	Contents	No. Of. Hours
I	The emergence of internet as a mass medium–the world of 'world wide web'.	6
II	Features of internet as a technology.	6
III	Internet as a source of infotainment – classification based on content and style.	6
IV	Demographic and psychographic descriptions of internet 'audiences' – effect of internet on the values and life-styles.	6
V	Present issues such as cyber crime and future possibilities.	6
	TOTAL HOURS	30

Course Outcomes		Programme Outcomes
CO	On completion of this course, students will	
CO1	Knows the basic concept in internet Concept of mass medium and world wide web	PO1, PO2, PO3, PO4, PO5, PO6
CO2	Knows the concept of internet as a technology.	PO1, PO2, PO3, PO4, PO5, PO6
CO3	Understand the concept of infotainment and classification based on content and style	PO1, PO2, PO3, PO4, PO5, PO6
CO4	Can be able to know about Demographic and psychographic description of internet	PO1, PO2, PO3, PO4, PO5, PO6
CO5	Understand the concept of cyber crime and future possibilities	PO1, PO2, PO3, PO4, PO5, PO6

Textbooks

1. Barnouw, E and Krishnaswamy S [1990] Indian Film. New York, OUP.
2. Kumar, Keval [1999] Mass Communication in India. Mumbai, Jaico.
3. Srivastava, K M [1992] Media Issues. Sterling Publishers Pvt Ltd.

Reference Book

1. Acharya, R N [1987] Television in India. Manas Publications, New Delhi.
2. Barnouw, E [1974] Documentary – A History of Nonfiction. Oxford, OUP
3. Luthra, H R [1986] Indian Broadcasting. Ministry of I& B, New Delhi.
4. Vasudev, Aruna [1986] The New Indian Cinema. Macmillan India, New Delhi.

Web Resources	
1.	https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf
2.	https://www.w3schools.com/html/default.asp

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	2	3	3	3
CO 3	2	3	3	3	3	3
CO 4	3	3	3	3	3	3
CO 5	3	3	3	2	3	3
Weightage of course contributed to each PSO	14	15	14	14	15	15

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

Subject Code 23U4CS4	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
CC-IV	MICROPROCESSOR AND MICROCONTROLLER	Core	5	-	-	-	5	25	75	100

Learning Objectives	
LO1	To introduce the internal organization of Intel 8085 Microprocessor.
LO2	To know about various instruction sets and classifictions
LO3	To enable the students to write assembly language programs using 8085.
LO4	To interface the peripheral devices to 8085 using Interrrupt controller and DMA interface.
LO5	To provide real-life applications using microcontroller.

UNIT	Contents	No. of Hours
I	Digital Computers - Microcomputer Organization-Computer languages – Microprocessor Architecture and its operations – Microprocessor initiated operations and 8085 Bus organization – Internal Data operations and 8085 registers - Peripheral or External initiated operations.	15
II	8085 Microprocessor – Pinout and Signals – Functional block diagram - 8085 Instruction Set and Classifications.	15
III	BCD to Binary and Binary to BCD conversions - ASCII to BCD and BCD to ASCII conversions - Binary to ASCII and ASCII to Binary conversions. BCD Arithmetic - BCD addition and Subtraction - Multibyte Addition and Subtraction - Multiplication and Division.	15
IV	The 8085 Interrupts – RIM AND SIM instructions-8259 Programmable Interrupt Controller-Direct Memory Access (DMA) and 8257 DMA controller.	15
V	Introduction to Microcontroller - Microcontroller Vs Microprocessor - 8051 Microcontroller architecture - 8051 pin description. Timers and Counters – Operating Modes- Control Registers. Interrupts – Interrupts in 8051 - Interrupts Control Register – Execution of interrupt.	15
	Total	**75**

Course Outcomes		Programme Outcomes
CO	On completion of this course, students will	
CO1	Remember the Basic binary codes and their conversions. Binary concepts are used in Microprocessor programming and provide a good understanding of the architecture of 8085o introduce the internal organization of Intel 8085 Microprocessor.	PO1
CO2	Understanding the 8085 instruction set and their classifications, enables the students to write the programs easily on their own using different logic.	PO1, PO2
CO3	Applying different types of instructions to convert binary codes and analyzing the outcome. The instruction set is applied to develop programs on multibyte arithmetic operations.	PO4, PO6
CO4	Analyze how peripheral devices are connected to 8085 using Interrupts and DMA controller.	PO4, PO5, PO6
CO5	An exposure to create real time applications using microcontroller.	PO3, PO6

Text Book	
1	R. S. Gaonkar- "Microprocessor Architecture- Programming and Applications with 8085"- 5th Edition- Penram International Publications, 2009. [For unit I to unit IV]
2	Soumitra Kumar Mandal -“Microprocessors and Microcontrollers – Architectures, Programming and Interfacing using 8085, 8086, 8051”, Tata McGraw Hill Education Private Limited. [For unit V].

Reference Books

1.	Mathur- “Introduction to Microprocessor”- 3rd Edition- Tata McGraw-Hill -1993.
2.	Raj Kamal - “Microcontrollers: Architecture, Programming, Interfacing and System Design”, Pearson Education, 2005.
3.	Krishna Kant, “Microprocessors and Microcontrollers – Architectures, Programming and System Design 8085, 8086, 8051, 8096”, PHI, 2008
Web Resources	
1.	E-content from open source libraries
2.	https://www.bing.com/, https://theopennotes.in/

Mapping with Programme Outcomes:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**2**	**2**	**2**	**2**
CO2	**3**	**3**	**3**	**2**	**3**	**2**
CO3	**3**	**3**	**3**	**3**	**3**	**2**
CO4	**3**	**3**	**3**	**3**	**3**	**2**
CO5	**3**	**3**	**3**	**2**	**3**	**2**
Weightage of course contributed to each PSO	**15**	**15**	**14**	**12**	**14**	**10**

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

Subject Code 23U4CSP4	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
CP-IV	**LAB-IV: MICROPROCESSOR AND MICROCONTROLLER**	Core Practical	-	-	3	-	3	40	60	100

Learning Objectives	
LO1	To introduce the internal organization of Intel 8085 Microprocessor.
LO2	To know about various instruction sets and classifictions
LO3	To enable the students to write assembly language programs using 8085.
LO4	To interface the peripheral devices to 8085 using Interrrupt controller and DMA interface.
LO5	To provide real-life applications using microcontroller.

	Details	**No. of Hours**
	List of Exercises:	
	Addition and Subtraction 1. 8 - bit addition 2. 16 - bit addition 3. 8 - bit subtraction 4. BCD subtraction II. Multiplication and Division 1. 8 - bit multiplication 2. BCD multiplication 3. 8 - bit division III. Sorting and Searching 1. Searching for an element in an array. 2. Sorting in Ascending and Descending order. 3. Finding the largest and smallest elements in an array. 4. Reversing array elements. 5. Block move. IV. Code Conversion 1. BCD to Hex and Hex to BCD 2. Binary to ASCII and ASCII to binary 3. ASCII to BCD and BCD to ASCII V. Simple programs on 8051 Microcontroller 1. Addition 2. Subtraction 3. Multiplication 4. Division 5. Interfacing Experiments using 8051 1. Realisation of Boolean Expression through ports. 2. Time delay generation using subroutines. 3. Display LEDs through ports	60
	Total	**60**

Course Outcomes		**Programme Outcome**
CO	On completion of this course, students will	
CO1	Remember the Basic binary codes and their conversions. Binary concepts are used in Microprocessor programming and provide a good understanding of the	PO1

	architecture of 8085o introduce the internal organization of Intel 8085 Microprocessor..	
CO2	Understanding the 8085 instruction set and their classifications, enables the students to write the programs easily on their own using different logic	PO1,PO2
CO3	Applying different types of instructions to convert binary codes and analyzing the outcome. The instruction set is applied to develop programs on multibyte arithmetic operations.	PO4,PO6
CO4	Analyze how peripheral devices are connected to 8085 using Interrupts and DMA controller.	PO4,PO5,PO6
CO5	An exposure to create real time applications using microcontroller.	PO3,PO5
Text Book		
1	R. S. Gaonkar- "Microprocessor Architecture- Programming and Applications with 8085"- 5th Edition- Penram International Publications,2009. [For unit I to unit IV]	
2	Soumitra Kumar Mandal -"Microprocessors and Microcontrollers – Architectures, Programming and Interfacing using 8085, 8086, 8051", Tata McGraw Hill Education Private Limited. [for unit V].	
Reference Books		
1.	Mathur- "Introduction to Microprocessor"- 3rd Edition- Tata McGraw-Hill -1993.	
2.	Raj Kamal - "Microcontrollers: Architecture, Programming, Interfacing and System Design", Pearson Education, 2005.	
3.	Krishna Kant, "Microprocessors and Microcontrollers – Architectures, Programming and System Design 8085, 8086, 8051, 8096", PHI, 2008	
Web Resources		
1.	E-content from open source libraries	
2.	https://www.bing.com/	

Mapping with Programme Outcomes:

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	2	2	3	3	2
CO2	3	3	2	3	3	2
CO3	3	3	3	3	3	2
CO4	3	3	2	3	3	2
CO5	3	3	2	3	3	2
Weightage of course contributed to each PSO	15	14	11	15	15	10

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

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks		
23U4CSSEC5								CIA	External	Total
SEC-V	NAAN MUDHALVAN / INTRODUCTION TO HTML	SEC	2	-	-	-	2	25	75	100

Learning Objectives	
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 Web page –HTML Basics: Understanding tags.	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)	6
III	Lists: Types of lists: Ordered, Unordered – Nesting Lists – Other tags: Marquee, HR, BR – Using Images – Creating Hyperlinks.	6
IV	Tables: Creating basic Table, Table elements, Caption – Table and cell alignment – Rowspan, Colspan – Cellpadding.	6
V	Frames: Frameset – Targeted Links–Noframe–Forms: Input, Textarea, Select, Option.	6
	TOTAL HOURS	**30**

Course Outcomes		Programme Outcomes
CO	On completion of this course, students will	
CO1	Knows the basic concept in HTML Concept of resources in HTML	PO1, PO2, PO3, PO4, PO5, PO6
CO2	Knows Design concept. Concept of Meta Data Understand the concept of save the files.	PO1, PO2, PO3, PO4, PO5, PO6
CO3	Understand the page formatting. Concept of list	PO1, PO2, PO3, PO4, PO5, PO6
CO4	Creating Links. Know the concept of creating link to email address	PO1, PO2, PO3, PO4, PO5, PO6
CO5	Concept of adding images Understand the table creation.	PO1, PO2, PO3, PO4, PO5, PO6

Textbooks

1. "Mastering HTML5 and CSS3 Made Easy", TeachUComp Inc., 2014.
2. **Thomas Michaud, "Foundations of Web Design: Introduction to HTML & CSS"**

Web Resources

1. https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf
2. https://www.w3schools.com/html/default.asp

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	2	3	3	3
CO 3	2	3	3	3	3	3
CO 4	3	3	3	3	3	3
CO 5	3	3	3	2	3	3
Weightage of course contributed to each PSO	14	15	14	14	15	15

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

Subject Code 23U5CS5	Subject Name	Category	L	T	P	S	Credits		Marks		
									CIA	External	Total
CC-V	COMPUTER NETWORKS	Core	5	-	-	-	5		25	75	100

Course Objective	
LO1	To learn the basic concepts of Data communication and Computer network
LO2	To learn about wireless Transmission
LO3	To learn about networking and data link layer.
LO4	To study about Network communication.
LO5	To learn the concept of Transport layer

UNIT	Contents	No. of Hours
I	Introduction – Network Hardware – Software – Reference Models – OSI and TCP/IP Models – Example Networks: Internet, ATM, Ethernet and Wireless LANs - Physical Layer – Theoretical Basis for Data Communication - Guided Transmission Media	15
II	Wireless Transmission - Communication Satellites – Telephone System: Structure, Local Loop, Trunks and Multiplexing and Switching. Data Link Layer: Design Issues – Error Detection and Correction.	15
III	Elementary Data Link Protocols - Sliding Window Protocols – Data Link Layer in the Internet - Medium Access Layer – Channel Allocation Problem – Multiple Access Protocols – Bluetooth.	15
IV	Network Layer - Design Issues - Routing Algorithms - Congestion Control Algorithms – IP Protocol – IP Addresses – Internet Control Protocols.	15
V	Transport Layer - Services - Connection Management - Addressing, Establishing and Releasing a Connection – Simple Transport Protocol – Internet Transport Protocols (ITP) - Network Security: Cryptography	15
	Total	**75**

Course Outcomes		Programme Outcome
CO	On completion of this course, students will	
CO1	To Understand the basics of Computer Network architecture, OSI and TCP/IP reference models	PO1
CO2	To gain knowledge on Telephone systems using wireless network	PO1, PO2
CO3	To understand the concept of MAC	PO4, PO6
CO4	To analyze the characteristics of Routing and Congestion control algorithms	PO4, PO5, PO6
CO5	To understand network security and define various protocols such as FTP, HTTP, Telnet, DNS	PO3, PO4

Text Book	
1	A.S.Tanenbaum, “Computer Networks”, 4th Edition, Prentice-Hall of India, 2008.

Reference Books	
1.	B. A. Forouzan, “Data Communications and Networking”, Tata McGraw Hill, 4th Edition, 2017
2.	F. Halsall, “Data Communications, Computer Networks and Open Systems”, Pearson Education, 2008
3.	D. Bertsekas and R. Gallagher, “Data Networks”, 2nd Edition, PHI, 2008.
4.	Lamarca, “Communication Networks”, Tata McGraw- Hill, 2002
Web Resources	
1.	https://en.wikipedia.org/wiki/Computer_network
2.	https://citationsy.com/styles/computer-networks

Mapping with Programme Outcomes:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	3	2	3
CO2	3	2	2	2	2	2
CO3	3	2	3	3	2	3
CO4	3	2	2	2	2	2
CO5	3	2	2	2	2	3
Weightage of course contributed to each PSO	15	11	11	12	10	13

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

Subject Code 23U5CS6	Subject Name	Category	L	T	P	S	Credits		Marks		
									CIA	External	Total
CC-VI	**DATABASE MANAGEMENT SYSTEM**	Core	5	-	-	-	4		25	75	100

Course Objective	
LO1	Describe basic concepts of database system
LO2	Design a Data model and Schemas in RDBMS
LO3	Competent in use of SQL
LO4	Analyze functional dependencies for designing robust Database
LO5	Describe basic concepts of database system

UNIT	**Details**	**No. of Hours**
I	Introduction to DBMS: Data and Information – Database – Database Management System – Applications – Purpose of Database Systems – Advantages and Disadvantages – View of Data: Data Abstraction – Instances and Schemas – Data Models – Database Languages – Database Architecture – Query Processor – Storage Manager – Transaction Manager.	15
II	Database Design: Design Phase – ER Model: Entity, Attributes and its types, Relationship and its types or Degree of Relationship – Entity set and its types – Entity Relationship Diagram(ER Diagram) – Merits and Demerits of ER Diagram. Relational Database Design: Objectives – Functional Dependency – Decomposition – Redundancy and Data Anomaly – Normalization: 1NF – 2NF – 3NF – BCNF – Database Security.	15
III	Structure of Relational Database: Basic Structure – Database Scheme – Keys – Query Language – Relational Algebra: Fundamental Operations – Select, Project, Rename, Cartesian Product, Union and Set-difference – Extended Operations – Join, Intersection and Divide – NULL Value.	15
IV	Introduction to SQL: SQL – Characteristics of SQL –Advantages of SQL – Basic Domain Types – Basic Structure of SQL – Rename Operation – String Operation – Set Operations – Aggregate Functions – Group by Clause – Having Clause – Sub Query – Modification. SQL Schemas – Advantages of Using Schema – SQL Integrity Constraints.	15
V	File Organization: Sequential Access, Direct Access – Methods of File Organization: Sequential Organization – Advantages and Disadvantages of Sequential Access – Indexed-Sequential Organization – Direct Organization.	15

Total		75
Course Outcomes		**Programme Outcome**
CO	On completion of this course, students will	
1	Understand basic concepts of database system	PO1
2	Design a Data model and Schemas in RDBMS	PO1, PO2
3	Understand Competent in use of SQL	PO4, PO6
4	Analyze functional dependencies for designing Robust Database	PO4, PO5, PO6
5	Understand basic concepts of database system	PO3, PO8
Text Book		
1	Abraham Silberchatz, Henry F. Korth, S. Sudarshan – Database System Concepts‖, McGraw Hill 2019, 7th Edition.	
Reference Books		
1.	S.Sumathi, S.Esakkirajan – Fundamentals of Relational Database Management System, Springer International Edition2007.	
2.	Alexis Leon & Mathews Leon – Fundamentals of DBMS‖, Vijay Nicole Publications 2014, 2nd Edition.	
Web Resources		
1.	NPTEL & MOOC courses titled Relational Database Management Systems	
2.	https://nptel.ac.in/courses/106106093/	
3.	https://nptel.ac.in/courses/106106095/	

Mapping with Programme Outcomes:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**2**	**1**	**3**	**-**	**-**
CO2	**-**	**-**	**1**	**-**	**2**	**2**
CO3	**3**	**2**	**1**	**3**	**-**	**-**
CO4	**3**	**-**	**1**	**-**	**2**	**2**
CO5	**3**	**2**	**1**	**3**	**2**	**2**
Weightage of course Contributed to each PSO	12	6	5	9	6	6

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

Subject Code 23U5CS7	Subject Name	Category	L	T	P	S	Credits		Marks		
									CIA	External	Total
CC-VII	OPERATING SYSTEM	Core	4	-	-	-	4		25	75	100

Learning Objectives	
LO1	Understand the basics of Operating systems and their working
LO2	Learn and understand operating system services and methods
LO3	Understand the different types of devices connected with Operating systems
LO4	Aware of the evolution and fundamental principles of operating system, processes and their communication.
LO5	Learn and understand the file management and the distributed file system concepts in operating systems

UNIT	Contents	No. Of. Hours
I	**Introduction**: what is an operating system?- system components – OS services – System Calls- System Programs – System Structure: Simple Structure – Layered Approach - Virtual Machines – System Design and Implementation: Design Goals	**15**
II	**Process Management:** Process Concept – Process Scheduling – CPU Scheduling: Basic concept – Scheduling Criteria – Scheduling Algorithms – Process Synchronization: The Critical Section problem – Semaphores – Deadlock: Deadlock Characterization – Deadlock Prevention – Deadlock avoidance – Detection.	**15**
III	**Storage Management:** Swapping – Contiguous Memory management – Paging Memory Management – Segmentation – Segmentation With Paging – Demand Paging – Page Replacement: Basic Scheme – Various Replacement Algorithms- Thrashing.	**15**
IV	**I/O Systems:** I/O Hardware – Polling- Direct Memory Access – I/O Interrupt – Application I/O Interface – Kernal I/O Subsystem: I/O Scheduling – Buffering – Caching - Spooling.	**15**
V	**OS Security:** The Security Problems – User Authentication – Program Threads – System Threads – Securing Systems and Facilities – Intrusion Detection.	**15**
	TOTAL HOURS	**75**

	Course Outcomes	Programme Outcomes
CO	On completion of this course, students will	
CO1	Recall the basic principles and importance of the operating system in a computer	PO1, PO2, PO3, PO4, PO5, PO6
CO2	Illustrate the objectives and functions of the operating system components	PO1, PO2, PO3, PO4, PO5, PO6
CO3	Identify the various operating system techniques	PO1, PO2, PO3, PO4, PO5, PO6
CO4	Analyze the issues and challenges of the operating system and security mechanisms	PO1, PO2, PO3, PO4, PO5, PO6

CO5	Evaluate the functions and features of file management in operating systems	PO1, PO2, PO3, PO4, PO5, PO6
Textbooks		
1	OPERATING SYSTEM CONCEPTS – Silberschatz, Galving, Gangne, Sixth Edition, Publication Wiley India.	
Reference Books		
1.	System Programming and Operating System – D.M Dhamdhere, Tata McGraw Hill publishing.	
2.	Dental H.M —Introduction to OS‖ Addison Wesley Publishing Co, 1998.	
3.	Remzi H. Arpaci-Dusseau, Andrea C. Arpaci-Dusseau,"Operating Systems: Three Easy Pieces", Create Space Independent Publishing Platform, 2018.	
Web Resources		
1.	https://www.tutorialspoint.com/operating_system/os_overview.html	
2.	https://www.javatpoint.com/operating-system	
3.	https://www.guru99.com/os-tutorial.html	

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	3	3	3	3	3
CO 4	3	3	3	3	2	3
CO 5	3	3	2	3	3	2
Weightage of course contributed to each PSO	15	15	14	15	14	14

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

Subject Code 23U5CSP5	Subject Name	Category	L	T	P	S	Credits		Marks		
									CIA	External	Total
CP-V	LAB-V: DATABASE MANAGEMENT SYSTEM	Core Practical	-	-	6	-	3		40	60	100

Learning Objectives	
LO1	To enable the students to learn the designing of data base systems, foundation on the relational model of data and normal forms.
LO2	To understood the concepts of data base management system, design simple Database models
LO3	To learn and understand to write queries using SQL, PL/SQL.
LO4	To enable the students to learn the designing of data base systems, foundation on the relational model of data and normal forms.
LO5	To understood the concepts of data base management system, design simple Database models

	List of Exercises:	No. of Hours	Course Objective
II	***I. SQL*** 1. DDL COMMANDS 2. DML COMMANDS 3. TCL COMMANDS ***II. PL/SQL*** 4. FIBONACCI SERIES 5. FACTORIAL 6. STRING REVERSE 7. SUM OF SERIES 8. TRIGGER ***III. CURSOR*** 9. STUDENT MARK ANALYSIS USING CURSOR ***IV. APPLICATION*** 10. LIBRARY MANAGEMENT SYSTEM 11. STUDENT MARK ANALYSIS		75
	Total		**75**

Course Outcomes		Programme Outcomes
CO	On completion of this course, students will	
CO1	Understand the various basic concepts of Data Base System. Difference between file system and DBMS and compare various data models.	PO1
CO2	Define the integrity constraints. Understand the basic concepts of Relational Data Model, Entity-Relationship Model.	PO1, PO2
CO3	Design database schema considering normalization and relationships within database. Understand and construct database using Structured Query Language. Attain a good practical skill of managing and retrieving of data using Data Manipulation Language (DML)	PO4, PO6
CO4	Classify the different functions and various join operations and enhance the	PO4, PO5, PO6

	knowledge of handling multiple tables.	
CO5	Learn to design Data base operations and implement using PL/SQL programs. Learn basics of PL/SQL and develop programs using Cursors, Exceptions	PO3, PO4
Text Book		
1	Coronel, Morris, Rob, "Database Systems, Design, Implementation and Management", Ninth Edition	
2	Nilesh Shah, "Database Systems Using Oracle", 2nd edition, Pearson Education India, 2016	
Reference Books		
1.	Abraham Silberschatz, Henry F.Korth and S.Sudarshan,"Database System Concepts", McGraw Hill International Publication ,VI Edition	
2.	Shio Kumar Singh , "Database Systems ",Pearson publications ,II Edition	
Web Resources		
1.	Web resources from NDL Library, E-content from open-source libraries	

Mapping with Programme Outcomes:

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	2	3	3	3	2
CO2	3	3	1	2	2	2
CO3	2	2	3	3	3	3
CO4	2	2	3	3	3	1
CO5	2	3	3	3	3	3
Weightage of course contributedto each PSO	12	12	13	14	14	11

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

Subject Code 23U5CSMBE1	Subject Name	Category	L	T	P	S	Credits		Marks		
									CIA	External	Total
MBE-I	**DATA STRUCTURES AND ALGORITHMS**	Major based Elective	4	-	-	-	3		25	75	100

Learning Objectives	
LO1	To understand the concepts of ADTs
LO2	To learn linear data structures-lists, stacks, queues
LO3	To learn Tree structures and application of trees
LO4	To learn graph strutures and and application of graphs
LO5	To understand various sorting and searching

UNIT	**Contents**	**No. of Hours**
I	Abstract Data Types (ADTs)- List ADT-array-based implementation-linked list implementation singly linked lists-circular linked lists-doubly-linked lists - 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- Priority Queue- deQueue applications of queues.	15
III	Tree ADT-tree traversals-Binary Tree ADT-expression trees-applications of trees-binary search tree ADT- Threaded Binary Trees-AVL Trees- B-Tree- B+ Tree – Heap - Applications of heap.	15
IV	Definition- Representation of Graph- Types of graph-Breadth first traversal – Depth first traversal-Topological sort- Bi-connectivity – Cut vertex- Euler circuits-Applications of graphs.	15
V	Searching- Linear search-Binary search-Sorting-Bubble sort-Selection sort-Insertion sort- merge sort – quick sort -Hashing-Hash functions-Separate chaining- Open Addressing-Rehashing Extendible Hashing	15
	Total	**75**

Course Outcomes		**Programmeme Outcome**
CO	On completion of this course, students will	
CO1	Understand the concept of Dynamic memory management, data types, algorithms, Big O notation	PO1,PO6
CO2	Understand basic data structures such as arrays, linked lists, stacks and queues	PO2
CO3	Describe the hash function and concepts of collision and its resolution methods	PO2,PO4
CO4	Solve problem involving graphs, trees and heaps	PO4,PO6
CO5	Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data	PO5,PO6

Text Book	
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,ChalesE.Leiserson,RonaldL.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/

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	1	3	3	3
CO 3	3	3	3	2	3	2
CO 4	3	2	3	2	3	3
CO 5	3	3	3	3	3	3
Weightage of course contributed to each PSO	15	14	13	13	15	14

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

Subject Code 23U5CSSEC6	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
MBE-II	DATA MINING AND WAREHOUSING	Major based Elective	4	-	-	-	3	25	75	100

Learning Objectives	
LO1	To provide the knowledge on Data Mining and Warehousing concepts and techniques
LO2	To study the basic concepts of Data Mining, Architecture and Comparison.
LO3	To study a set of Mining Association Rules, Data Warehouses.
LO4	To study about Classification and Prediction, Classifier Accuracy
LO5	To study the basic concepts of cluster analysis, Cluster Methods

UNIT	Contents	No. of Hours
I	Introduction: Data mining – Functionalities – Classification – Introduction to Data Warehousing – Data Preprocessing: Preprocessing the Data – Data cleaning – Data Integration and Transformation – Data Reduction	15
II	Data Mining, Primitives, Languages and System Architecture: Data Mining – Primitives – Data Mining Query Language, Architecture of Data mining Systems. Concept Description, Characterization and Comparison: Concept Description, Data Generalization and Summarization, Analytical Characterization, Mining Class Comparison – Statistical Measures.	15
III	Mining Association Rules: Basic Concepts – Single Dimensional Boolean Association Rules From Transaction Databases, Multilevel Association Rules from transaction databases – Multi dimension Association Rules from Relational Database and Data Warehouses.	15
IV	Classification and Prediction: Introduction – Issues – Decision Tree Induction – Bayesian Classification – Classification of Back Propagation. Classification based on Concepts from Association Rule Mining – Other Methods. Prediction – Introduction – Classifier Accuracy	15
V	Cluster Analysis: Introduction – Types of Data in Cluster Analysis, Petitioning Methods – Hierarchical Methods-Density Based Methods – GRID Based Method – Model based Clustering Method	15
	Total	**75**

Course Outcomes		
Course Outcomes	On completion of this course, students will;	
CO1	To understand the basic concepts and the functionality of the various data mining and data warehousing component	PO1, PO3, PO6, PO8
CO2	To know the concepts of Data mining system architectures	PO1,PO2,PO3,PO6
CO3	To analyze the principles of association rules	PO3, PO5
CO4	To get analytical idea on Classification and prediction methods	PO1, PO2, PO3, PO5
CO5	To Gain knowledge on Cluster analysis and its methods.	PO2, PO4, PO6

Text Books (Latest Editions)	
1.	Han and M. Kamber, “Data Mining Concepts and Techniques”, 2001, Harcourt India Pvt. Ltd, New Delhi.

References Books (Latest editions)	
1.	K.P. Soman, ShyamDiwakar, V. Ajay “Insight into Data Mining Theory and Practice “,Prentice Hall of India Pvt. Ltd, New Delhi

2.	Parteek Bhatia, 'Data Mining and Data Warehousing: Principles and Practical Techniques', Cambridge University Press, 2019
Web Resources	
1	https://www.javatpoint.com/data-mining-cluster-vs-data-warehousing
2	https://www.tutorialspoint.com/Data-Warehousing-and-Data-Mining

Mapping with Programme Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	**3**	**3**	**3**	**3**	**3**	**3**
CO2	**3**	**3**	**2**	**3**	**2**	**2**
CO3	**3**	**2**	**3**	**3**	**3**	**2**
CO4	**3**	**2**	**3**	**2**	**3**	**3**
CO5	**2**	**3**	**3**	**3**	**3**	**3**
Weight age of course contributed to each PSO	**14**	**13**	**14**	**14**	**14**	**13**

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

Subject Code 23U5CSSEC6	Subject Name	Category	L	T	P	S	Credits		Marks		
									CIA	External	Total
SEC-VI	**NAAN MUDHALVAN / WEB DESIGNING**	SEC	2	-	-	-	2		25	75	100

Learning Objectives	
LO1	Understand the basics of HTML and its components
LO2	To study about the Graphics in HTML
LO3	Understand and apply the concepts of XML and DHTML
LO4	Understand the concept of JavaScript
LO5	To identify and understand the goals and objectives of the Ajax

UNIT	Details	No. of Hours
I	HTML: HTML-Introduction-tag basics- page structure-adding comments working with texts, paragraphs and line break. Emphasizing test- heading and horizontal rules-list-font size, face and color-alignment links-tables-frames.	6
II	Forms & Images Using Html: Graphics: Introduction-How to work efficiently with images in web pages, image maps, GIF animation, adding multimedia, data collection with html forms textbox, password, list box, combo box, text area, tools for building web page front page.	6
III	XML & DHTML: Cascading style sheet (CSS)-what is CSS-Why we use CSS-adding CSS to your web pages-Grouping styles-extensible markup language (XML).	6
IV	Dynamic HTML: Document object model (DCOM)-Accessing HTML & CSS through DCOM Dynamic content styles & positioning-Event bubbling-data binding. JavaScript: Client-side scripting, What is JavaScript, How to develop JavaScript, simple JavaScript, variables, functions, conditions, loops and repetition,	6
V	Advance script, JavaScript and objects, JavaScript own objects, the DOM and web browser environments, forms and validations.	6
	Total	**30**

Course Outcomes		Programme Outcome
CO	On completion of this course, students will	
CO1	Develop working knowledge of HTML	PO1, PO3, PO6, PO8
CO2	Ability to Develop and publish Web pages using Hypertext Markup Language (HTML).	PO1,PO2,PO3,PO6
CO3	Ability to optimize page styles and layout with Cascading Style Sheets (CSS).	PO3, PO5
CO4	Ability to develop a java script	PO1, PO2, PO3, PO7
CO5	An ability to develop web application using Ajax.	P02, PO6, PO7

Text Book	
1	Pankaj Sharma, “Web Technology”, SkKataria& Sons Bangalore 2011.
2	Mike Mcgrath, “Java Script”, Dream Tech Press 2006, 1st Edition.
3	Achyut S Godbole&AtulKahate, “Web Technologies”, 2002, 2nd Edition.

Reference Books	
1.	Laura Lemay, RafeColburn , Jennifer Kyrnin, “Mastering HTML, CSS &Javascript Web Publishing”, 2016.
2.	DT Editorial Services (Author), “HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery)”, Paperback 2016, 2nd Edition.

Web Resources	
1.	NPTEL & MOOC courses titled Web Design and Development.
2.	https://www.geeksforgeeks.org

Mapping with Programme Outcomes:

MAPPING TABLE						
CO/ PSO	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**	**PSO 6**
CO1	**3**	**2**	**1**	**2**	**1**	**2**
CO2	**3**	**3**	**2**	**2**	**3**	**3**
CO3	**3**	**3**	**2**	**3**	**3**	**2**
CO4	**3**	**2**	**3**	**2**	**2**	**3**
CO5	**3**	**2**	**2**	**2**	**3**	**3**
Weightage of course contributed to each PSO	**15**	**12**	**10**	**11**	**12**	**13**

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

Subject Code 23U6CS8	Subject Name	Category	L	T	P	S	Credits		Marks		
									CIA	External	Total
CC-VIII	**SOFTWARE ENGINEERING**	Core	6	-	-	-	5		25	75	100

Learning Objectives	
LO1	Gain basic knowledge of analysis and design of systems
LO2	To know about the requirements for software design
LO3	Ability to design an effective model of the system
LO4	Perform Testing at various levels and produce an efficient system.
LO5	To know about the software quality and software maintenance.

UNIT	**Contents**	**No. of Hours**
I	**Introduction**: software engineering definition -Programs vs. software products – Application of software engineering . Software Myths: management myths – Customer Myths – Practitioner's Myths. **Life Cycle Models**: waterfall model - prototyping model- spiral model.	15
II	**Requirements Engineering:** Requirements engineering tasks :-Inception – Elicitation – Elaboration – Negotiation – Specification – validation –Requirements Management. **Requirement Analysis:** Overall objective and philosophy – Analysis Rules of Thumb – Domain Analysis..Data modeling concepts: Data Object – Data Attributes – Relationships –cardinality and Modality.	15
III	**Software Design Engineering**: Design Process and Design Quality attributes – Basic Design concepts –Design Model - Pattern Based Software Design. Modeling Component – Level Design: Component Design Principles - Cohesion and Coupling..	15
IV	**Testing Strategies:** Verification and validation – unit testing - black-box testing - white-box testing-Validation Testing – System Testing – Debugging.	15
V	**Product Metrics: Software Quality:** McCall's Quality Factors –ISO 9126 Quality factors .Metrics for the Analysis Model : Function based Metrics – Metrics for Specification Quality. Source Code metrics – Software testing metrics. **Quality Management:** Quality concepts – Software Quality Assurance – Software Reliability.	15
	Total	**75**

Course Outcomes

Course Outcomes	On completion of this course, students will;	
CO1	Gain basic knowledge of analysis and design of systems	PO1
CO2	To know about the requirements for software design	PO1, PO2
CO3	Ability to design an effective model of the system	PO4, PO6
CO4	Perform Testing at various levels and produce an efficient system.	PO4, PO5, PO6
CO5	Gain basic knowledge about software management	PO3, PO6

Text Books

1.	Roger S. Pressman, Software Engineering, Sixth Edition, McGraw-Hill.

References Books

1.	Richard Fairley, Software Engineering Concepts, Tata McGraw-Hill publishing company Ltd, Edition 1997
2.	James A. Senn, Analysis & Design of Information Systems, Second Edition, McGraw-Hill International Editions

Mapping with Programme Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	**3**	**2**	**3**	**2**	**2**	**3**
CO2	**3**	**2**	**2**	**2**	**1**	**2**
CO3	**3**	**3**	**3**	**2**	**3**	**2**
CO4	**3**	**3**	**3**	**2**	**2**	**2**
CO5	**3**	**3**	**3**	**2**	**2**	**2**

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

Subject Code 23U6CS9	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
CC-IX	.NET PROGRAMMING	Core	5	-	-	-	5	25	75	100

Course Objective	
C1	To identify and understand the goals and objectives of the .NET framework and ASP.NET with C# language.
C2	To develop ASP.NET Web application using standard controls.
C3	To implement file handling operations.
C4	To handles SQL Server Database using ADO.NET.
C5	Understand the Grid view control and XML classes.

UNIT	Contents	No. of Hours
I	Overview of .NET framework: Common Language Runtime (CLR), Framework Class Library- C# Fundamentals: Primitive types and Variables – Operators - Conditional statements -Looping statements – Creating and using Objects – Arrays – String operations.	18
II	Introduction to ASP.NET - IDE-Languages supported Components -Working with Web Forms – Web form standard controls: Properties and its events – HTML controls -List Controls: Properties and its events.	18
III	Rich Controls: Properties and its events – validation controls: Properties and its events– File Stream classes - File Modes – File Share – Reading and Writing to files – Creating, Moving, Copying and Deleting files – File uploading.	18
IV	ADO.NET Overview – Database Connections – Commands – Data Reader - Data Adapter - Data Sets - Data Controls and its Properties – Data Binding	18
V	Grid View control: Deleting, editing, Sorting and Paging. XML classes – Web form to manipulate XML files - Website Security - Authentication - Authorization – Creating a Web application.	18
	Total	**90**

Course Outcomes		Programme Outcome
CO	On completion of this course, students will	
1	Develop working knowledge of C# programming constructs and the .NET Framework	PO1, PO2, PO6
2	To develop a software to solve real-world problems using ASP.NET	PO2, PO3, PO5
3	To Work On Various Controls Files	PO1, PO3, PO6
4	To create a web application using MicrosoftADO.NET.	PO2, PO6
5	To develop web applications using XML	PO1, PO3, PO6

Text Book	
1	SvetlinNakov,VeselinKolev& Co, Fundamentals of Computer Programming with C#,Faber publication,2019.
2	Mathew, Mac Donald, The Complete Reference ASP.NET, Tata McGraw-Hill,2015.

Reference Books	
1.	Herbert Schildt, The Complete Reference C#.NET, TataMcGraw-Hill,2017.
2.	Kogent Learning Solutions, C# 2012 Programming Covers .NET 4.5 Black Book, Dreamtechpres, 2013.
3.	Anne Boehm, Joel Murach, Murach's C# 2015, Mike Murach& Associates Inc. 2016.
4.	DenielleOtey, Michael Otey, ADO.NET: The Complete reference, McGrawHill, 2008.

5.	Matthew MacDonald, Beginning ASP.NET 4 in C# 2010, APRESS, 2010.
Web Resources	
1.	https://www.geeksforgeeks.org/introduction-to-net-framework/
2.	https://www.javatpoint.com/net-framework

Mapping with Programme Outcomes:

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	3	3	3	2	3
CO2	3	2	2	3	3	3
CO3	3	3	3	2	3	3
CO4	2	2	1	3	3	2
CO5	3	3	3	3	3	3
Weightage of course contributed to each PSO	14	13	12	14	14	14

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

Subject Code 23U6CSP6	Subject Name	Category	L	T	P	S	Credits		Marks		
									CIA	External	Total
CP-VI	LAB-VI: .NET PROGRAMMING	Core Practical	-	-	3	-	5		40	60	100

Course Objective	
LO1	To develop ASP.NET Web application using standard controls.
LO2	To create rich database applications using ADO.NET.
LO3	To implement file handling operations.
LO4	To implement XML classes.
LO5	To utilize ASP.NET security features for authenticating the website

Sl. No	Programs	No. of Hours
1.	Create an exposure of Web applications and tools	75
2.	Implement the Html Controls	
3.	Implement the Server Controls	
4.	Web application using Web controls.	
5.	Web application using List controls.	
6.	Web Page design using Rich control. Validate user input using Validation controls. Working with File concepts.	
7.	Web application using Data Controls.	
8.	Data binding with Web controls	
9.	Data binding with Data Controls.	
10.	Database application to perform insert, update and delete operations.	
11.	Database application using Data Controls to perform insert, delete, edit, paging and sorting operation.	
12.	Implement the Xml classes.	
13.	Implement Authentication – Authorization.	
14.	Ticket reservation using ASP.NET controls.	
15.	Online examination using ASP.NET controls	
	Total	**75**

Course Outcomes		Programme Outcome
CO	On completion of this course, students will	
CO 1	To create web applications and implement various controls	PO1, PO2, PO4
CO2	Create web pages in Rich control.	PO3, PO5
CO3	Develop knowledge about file handling operations	PO1, PO4, PO5
CO4	An ability to design XML classes	PO2, PO4,

		PO6
CO5	To develop a software to solve real-world problems using ASP.NET	PO1,PO3, PO5, PO6

Text Book	
1	SvetlinNakov, VeselinKolev & Co, Fundamentals of Computer Programming with C#, Faber publication, 2019.
2	Mathew, Mac Donald, The Complete Reference ASP.NET, Tata McGraw-Hill,2015.
Reference Books	
1.	Herbert Schildt, The Complete Reference C#.NET, TataMcGraw-Hill, 2017.
2.	Kogent Learning Solutions, C# 2012 Programming Covers .NET 4.5 Black Book, Dreamtech pres, 2013.
3.	Anne Boehm, Joel Murach, Murach's C# 2015, Mike Murach& Associates Inc. 2016.
4.	DenielleOtey, Michael Otey, ADO.NET: The Complete reference, McGrawHill, 2008.
5.	Matthew MacDonald, Beginning ASP.NET 4 in C# 2010, APRESS, 2010.
Web Resources	
1.	https://www.geeksforgeeks.org/introduction-to-net-framework/
2.	https://www.javatpoint.com/net-framework

Mapping with Programme Outcomes:

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	**3**	**2**	**1**	**2**	**1**	**2**
CO2	**3**	**3**	**2**	**2**	**3**	**3**
CO3	**3**	**3**	**2**	**3**	**3**	**2**
CO4	**3**	**2**	**3**	**2**	**2**	**3**
CO5	**3**	**2**	**2**	**2**	**3**	**3**
Weightage of course contributed to each PSO	**15**	**12**	**10**	**11**	**12**	**13**

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

Subject Code 23U6CSMBE3	Subject Name	Category	L	T	P	S	Credits		Marks		
									CIA	External	Total
MBE-III	**COMPUTER GRAPHICS**	Major based Elective	5	-	-	-	3		25	75	100

Course Objective	
LO1	Introduction to computer graphics
LO2	Display devices and graphics software
LO3	Output primitives and functions
LO4	Two-dimensional transformation
LO5	Computer animation and design

UNIT	**Contents**	**No. of Hours**
I	A survey of computer graphics: Computer aided design – presentation graphics – computer art – entertainment – education and training – visualization – image processing – graphical user interface.	12
II	Overview of graphics systems: Video display devices – Raster scan systems – Random scan systems – graphics monitors and workstations – input devices – hard copy devices – graphics software.	12
III	Attributes of output primitives: Line attributes – curve attributes – color and grayscale levels – area fill attributes – character attributes – bundled attributes – inquiry functions.	12
IV	Two dimensional geometric transformations: Basic transformation – matrix representation – composite transformation – other transformation.	12
V	Computer Animation: Design of animation sequence – general computer animation functions – raster animation – computer animation languages – key frame systems – morphine – simulating accelerations – motion specification – direct motion specification – goal directed systems – kinematics and dynamics.	12
	Total	**60**

Course Outcomes		**Programme Outcome**
CO	On completion of this course, students will	
CO 1	Students will be able to describe the fundamental algorithms used in computer graphics and to some extent be able to compare and evaluate them.	PO1
CO 2	Students will be able to work and interact, through hands-on experiences, to design, develop, and modify electronically generated imaginary using a wide range of sophisticated graphical tools and techniques.	PO1, PO2
CO 3	Students will be able to explain about the technology necessary for creating multimedia content for the web, video, DVD, 2D and 3D graphics, Sound and programming.	PO4, PO5
CO 4	Students will be able to explain two dimension transformations	PO4, PO5, PO6
CO 5	Students can apply the knowledge, techniques, skills	PO3, PO6

	and modern tools to become successful professionals in communication and media industries.	
Text Book		
1	Computer graphics – Donald Hearn & M. Pauline Baker – Prentice – Hall of India Pvt. Ltd.	
Reference Books		
1.	Newman William M, & Sproull Robert F, Principles of interactive computer graphics, Second edition, Tata –McGraw Hill, 1 (ISBN 0-07-463293-0)	
Web Resources		
1.	https://en.wikipedia.org	

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	3	3	3	3	3
CO 4	3	3	3	3	2	3
CO 5	3	3	2	3	3	2
Weightage of course contributed to each PSO	15	15	14	15	14	14

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

Subject Code 23U6CSMBE4	Subject Name	Category	L	T	P	S	Credits		Marks		
									CIA	External	Total
MBE-IV	CLOUD COMPUTING	Major Based Elective	5	-	-	-	3		25	75	100

Course Objective

LO1	Learning fundamental concepts and Technologies of Cloud Computing.
LO2	Learning various cloud service types and their uses and pitfalls.
LO3	To learn about Cloud Architecture and Application design.
LO4	To know the various aspects of application design, benchmarking and security on the Cloud.
LO5	To learn the various Case Studies in Cloud Computing.

UNIT	Contents	No. of Hours
I	**Introduction to Cloud Computing:** Definition of Cloud Computing – Characteristics of Cloud Computing – Cloud Models – Cloud Service Examples – Cloud-based Services and Applications. Cloud Concepts and Technologies: Virtualization – Load balancing – Scalability and Elasticity – Deployment – Replication – Monitoring – Software Defined Networking – Network Function Virtualization – MapReduce – Identity and Access Management – Service Level Agreements – Billing.	12
II	**Cloud Services:** Compute Services: Amazon Elastic Computer Cloud - Google Compute Engine - Windows Azure Virtual Machines Storage Services: Amazon Simple Storage Service - Google Cloud Storage - Windows Azure Storage .Database Services: Amazon Relational Data Store - Amazon Dynamo DB - Google Cloud SQL - Google Cloud Data Store - Windows Azure **SQL Database - Windows Azure Table Service.** Application Services: Application Runtimes and Frameworks - Queuing Services - Email Services - Notifiction Services - Media Services Content Delivery Services: Amazon CloudFront - Windows Azure Content Delivery Network. Analytics Services: Amazon Elastic MapReduce - Google MapReduce Service - Google BigQuery - Windows Azure HDInsight.Deployment and Management Services: Amazon Elastic Beanstack - Amazon Cloud Formation Identity and Access Management Services: Amazon Identiy and Access Management - Windows Azure Active Directory . Open Source Private Cloud Software: CloudStack – Eucalyptus - OpenStack	12
III	**Cloud Application Design:** Introduction – Design Consideration for Cloud Applications – Scalability – Reliability and Availability – Security – Maintenance and Upgradation – Performance – Reference Architectures for Cloud Applications – Cloud Application Design Methodologies: Service Oriented Architecture (SOA), Cloud Component Model, IaaS, PaaS and SaaS Services for Cloud Applications, Model View Controller (MVC), RESTful Web Services – Data Storage Approaches: RelationalApproach (SQL), Non-RelationalApproach (NoSQL).	12
IV	**Cloud Application Benchmarking and Tuning:** Introduction to Benchmarking – Steps in Benchmarking – Workload Characteristics – Application Performance Metrics – Design Consideration for BenchmarkingMethodology – Benchmarking Tools and Types of Tests – Deployment Prototyping.	12
V	**Case Studies:** Cloud Computing for Healthcare – Cloud Computing for EnergySystems - Cloud Computing for Transportation Systems - Cloud Computing for Manufacturing Industry - Cloud Computing for Education.	12
	Total	**60**

Course Outcomes	Programme Outcome

CO	On completion of this course, students will	
CO 1	Understand the fundamental concepts and Technologies in Cloud Computing.	PO1
CO 2	Able to understand various cloud service types and their uses and pitfalls.	PO1, PO2
CO 3	Able to understand Cloud Architecture and Application design.	PO4, PO5
CO 4	Understand the various aspects of application design, benchmarking and security in the Cloud.	PO4, PO5, PO6
CO 5	Understand various Case Studies in Cloud Computing.	PO3, PO6
Text Book		
1	ArshdeepBahga, Vijay Madisetti, *Cloud Computing – A Hands On Approach*, Universities Press (India) Pvt. Ltd., 2018	
Reference Books		
1.	Anthony T Velte, Toby J Velte, Robert Elsenpeter, *Cloud Computing: A Practical Approach*, Tata McGraw-Hill, 2013.	
2.	Barrie Sosinsky, *Cloud Computing Bible*, Wiley India Pvt. Ltd., 2013.	
3.	David Crookes, *Cloud Computing in Easy Steps*, Tata McGraw Hill, 2015.	
4.	Dr. Kumar Saurabh, *Cloud Computing*, Wiley India, Second Edition 2012.	
Web Resources		
1.	https://en.wikipedia.org/wiki/Cloud_computing	
2.	https://link.springer.com/chapter/10.1007/978-3-030-34957-8_7	
3.	https://webobjects.cdw.com/webobjects/media/pdf/solutions/cloud-computing/121838-CDW-Cloud-Computing-Reference-Guide.pdf	

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	3	3	3	3	3
CO 4	3	3	3	3	2	3
CO 5	3	3	2	3	3	2
Weightage of course contributed to each PSO	15	15	14	15	14	14

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

Subject Code	Subject Name	Category	L	T	P	S	Credits		Marks		
23U6CSSEC7									CIA	External	Total
SEC-VII	NAAN MUDHALVAN / ADVANCED EXCEL	SEC	2	-	-	-	2		25	75	100

Learning Objectives	
LO1	Handle large amounts of data
LO2	Aggregate numeric data and summarize into categories and subcategories
LO3	Filtering, sorting, and grouping data or subsets of data
LO4	Create pivot tables to consolidate data from multiple files
LO5	Presenting data in the form of charts and graphs

UNIT	Contents	No. of Hours
I	Basics of Excel- Customizing common options- Absolute and relative cells- Protecting and un-protecting worksheets and cells- Working with Functions - Writing conditional expressions - logical functions - lookup and reference functions- VlookUP with Exact Match, Approximate Match- Nested VlookUP with Exact Match- VlookUP with Tables, Dynamic Ranges- Nested VlookUP with Exact Match- Using VLookUP to consolidate Data from Multiple Sheets	6
II	Data Validations - Specifying a valid range of values - Specifying a list of valid values- Specifying custom validations based on formula - Working with Templates Designing the structure of a template- templates for standardization of worksheets - Sorting and Filtering Data -Sorting tables- multiple-level sorting- custom sorting- Filtering data for selected view - advanced filter options- Working with Reports Creating subtotals- Multiple-level subtotal.	6
III	Creating Pivot tables Formatting and customizing Pivot tables- advanced options of Pivot tables- Pivot charts- Consolidating data from multiple sheets and files using Pivot tables- external data sources- data consolidation feature to consolidate data- Show Value As % of Row, % of Column, Running Total, Compare with Specific Field- Viewing Subtotal under Pivot- Creating Slicers.	6
IV	More Functions Date and time functions- Text functions- Database functions- Power Functions - Formatting Using auto formatting option for worksheets- Using conditional formatting option for rows, columns and cells- What If Analysis - Goal Seek- Data Tables- Scenario Manager.	6
V	Charts - Formatting Charts- 3D Graphs- Bar and Line Chart together- Secondary Axis in Graphs- Sharing Charts with PowerPoint / MS Word, Dynamically- New Features Of Excel Sparklines, Inline Charts, data Charts- Overview of all the new features.	6
	Total	**30**

Course Outcomes		Programme Outcomes
CO	On completion of this course, students will	
CO1	Work with big data tools and its analysis techniques.	PO1
CO2	Analyze data by utilizing clustering and classification algorithms.	PO1, PO2
CO3	Learn and apply different mining algorithms and recommendation systems for large volumes of data.	PO4, PO6
CO4	Perform analytics on data streams.	PO4, PO5, PO6
CO5	Learn No-SQL databases and management.	PO3, PO8

Text Book	
1	Excel 2019 All
2	Microsoft Excel 2019 Pivot Table Data Crunching

Reference Books	
1	Excel 2019 All-in-One for Dummies, Greg Harvey, 1st edition
Web Resources	
1.	https://www.simplilearn.com
2	https://www.javatpoint.com
3	https://www.w3schools.com

Mapping with Programme Outcomes:

CO/ PSO	PSO-1	PSO-2	PSO-3	PSO-4	PSO-5	PSO-6
CO1	3	3	2	3	3	3
CO2	3	2	2	3	3	3
CO3	3	3	2	3	3	3
CO4	3	2	2	3	3	3
CO5	3	2	2	3	3	3
Weightage of course contributed to each PSO	15	12	10	15	15	15

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

Annexure -II

UG – B.Sc Mathematics (Shift II)

Allied courses offered by the department of computer Science (Third & Fourth Semesters)

Part	Course	Credit	Ins. Hours	Marks		Total
				Int	Ext	
III	AC-I: Computer Science I: Data base Management system	4	4	25	75	100
III	AC-II: Computer Science II: Practical- MySQL Lab (Carry over)	3	2+4	40	60	100
III	AC-III: Computer Science III: HTML and Web design	3	3	**25**	**75**	100

Subject Code	Subject Name	Category	L	T	P	S	Credits		Marks		
									CIA	External	Total
AC-I	**COMPUTER SCIENCE I: DATABASE MANAGEMENT SYSTEM**	Allied Core	4	-	-	-	4		25	75	100

Learning Objectives	
LO1	To Understand the basic concepts and the applications of database systems.
LO2	To Understand the data base Users and Administrator.
LO3	To Understand the ER diagrams and ER Model.
LO4	To Master the basics of SQL and construct queries using SQL.
LO5	To Understand the relational database design principles.

UNIT	**Contents**	**No. of Hours**
I	Introduction to Database – Database Systems Applications –Database system versus File Systems- Purpose of Database Systems - View of data : Data Abstraction, Instance and Schema.	15
II	Data Models: E-R model, Relational Model - Database Languages – Data Definition languages, Data manipulation Languages - Database system structure - Database Architecture – History of Database Systems.	15
III	E-Models: Basic concepts - Entity Relationship Diagram. Relational Model: Structure of Relational Database, Relational Algebra - Additional Relational Algebra Operations.	15
IV	SQL: Basic structure of SQL Queries - Set Operations – Aggregate Functions– Null Values - Views- Modification of the Database - Join Relations.	15
V	Relational Database Design: Features of Good Relational Designs - First Normal Form - Functional Dependency – Decomposition.	15
	Total	**75**

Course Outcomes		**Program Outcome**
CO	On completion of this course, students will	
CO1	Understand the various basic concepts of Data Base System. Difference between file system and DBMS and compare various data models	PO1,PO6
CO2	Define the integrity constraints. Understand the basic concepts of Relational Data Model, Entity-Relationship Model	PO2
CO3	Classify the different functions and various join operations and enhance the knowledge of handling multiple tables.	PO2,PO4
CO4	Understand and construct database using Structured Query Language.	PO4,PO6
CO5	Attain a good practical skill of managing and retrieving of data using Data Manipulation Language (DML)	PO5,PO6

Text Book	
1	**Database System Concepts, Fourth Edition**. Fifth edition, published by McGraw-Hill,

	Abraham Silberschatz, Henry F.Korth, S.Sudarshan, McGraw-Hill
Reference Books	
1.	DBMS designing and Business Application by GERALD V. POST- McGraw Hill publications.

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	1	3	3	3
CO 3	3	3	3	2	3	2
CO 4	3	2	3	2	3	3
CO 5	3	3	3	3	3	3
Weightage of course contributed to each PSO	15	14	13	13	15	14

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

Subject Code	Subject Name	Category	L	T	P	S	Credits		Marks		
									CIA	External	Total
AC-II	**COMPUTER SCIENCE II: PRACTICAL - MYSQL LAB (CARRY OVER)**	Allied Core Practical	-	-	2 + 4	-	3		40	60	100

Learning Objectives	
LO1	To enable the students to learn the designing of data base systems, foundation on the relational model of data and normal forms.
LO2	To understood the concepts of data base management system, design simple Database models
LO3	To learn and understand to write queries using SQL, PL/SQL.
LO4	To enable the students to learn the designing of data base systems, foundation on the relational model of data and normal forms.
LO5	To understood the concepts of data base management system, design simple Database models

LIST OF EXERCISES	
1	Create table EMPLOYEE with the following columns empno (vc, 5) (P), empname(vc, 15), designation (vc, 15), doj (date), salary(number), sex (vc, 5), deptno (vc, 5), deptname (vc, 15).
2	Insert 10 records in the table.
3	Display the details of female employees.
4	Display the details of employees those who are joining from June 2000 to May 2014.
5	Display the details of employees working in B.Sc department.
6	Display the total number of employees drawn above 1,00,000.
7	Display the details of employees whose designation is Associate Professor.
8	Display the details of employee who drawn maximum salary.
9	Update the salary of employees whose salary between 50000 and 60000 add 500 each.
10	Delete the records whose designation is “Assistant Professor”

Course Outcomes		**Programme Outcomes**
CO	On completion of this course, students will	
CO1	Understand the various basic concepts of Data Base System. Difference between file system and DBMS and compare various data models.	PO1
CO2	Define the integrity constraints. Understand the basic concepts of Relational Data Model, Entity-Relationship Model.	PO1, PO2
CO3	Design database schema considering normalization and relationships within database. Understand and construct database using Structured Query Language. Attain a good practical skill of managing and retrieving of data using Data Manipulation Language (DML)	PO4, PO6
CO4	Classify the different functions and various join operations and enhance the knowledge of handling multiple tables.	PO4, PO5, PO6
CO5	Learn to design Data base operations and implement using PL/SQL programs. Learn basics of PL/SQL and develop programs using Cursors, Exceptions	PO3, PO4

Text Book	
1	Paul Weinberg, James Groff, Andrew Oppel, “SQL: The Complete Reference”, Third Edition.

Reference Books	
1.	Abraham Silberschatz, Henry F.Korth and S.Sudarshan, “Database System Concepts”, McGraw Hill International Publication, VI Edition

2.	Shio Kumar Singh, “Database Systems “, Pearson publications, II Edition
Web Resources	
1.	Web resources from NDL Library, E-content from open-source libraries

Mapping with Programme Outcomes:

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	**3**	**2**	**3**	**3**	**3**	**2**
CO2	**3**	**3**	**1**	**2**	**2**	**2**
CO3	**2**	**2**	**3**	**3**	**3**	**3**
CO4	**2**	**2**	**3**	**3**	**3**	**1**
CO5	**2**	**3**	**3**	**3**	**3**	**3**
Weightage of course contributed to each PSO	**12**	**12**	**13**	**14**	**14**	**11**

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

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
AC-III	COMPUTER SCIENCE III: HTML AND WEB DESIGN	Allied Core	3	-	-	-	3	25	75	100

Learning Objectives	
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 Web page –HTML Basics: Understanding tags.	15
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)	15
III	Lists: Types of lists: Ordered, Unordered – Nesting Lists – Other tags: Marquee, HR, BR – Using Images – Creating Hyperlinks.	15
IV	Tables: Creating basic Table, Table elements, Caption – Table and cell alignment – Rowspan, Colspan – Cellpadding.	15
V	Frames: Frameset – Targeted Links–Noframe–Forms: Input, Textarea, Select, Option.	15
	TOTAL HOURS	75

Course Outcomes		Programme Outcomes
CO	On completion of this course, students will	
CO1	Knows the basic concept in HTML Concept of resources in HTML	PO1, PO2, PO3, PO4, PO5, PO6
CO2	Knows Design concept. Concept of Meta Data Understand the concept of save the files.	PO1, PO2, PO3, PO4, PO5, PO6
CO3	Understand the page formatting. Concept of list	PO1, PO2, PO3, PO4, PO5, PO6
CO4	Creating Links. Know the concept of creating link to email address	PO1, PO2, PO3, PO4, PO5, PO6
CO5	Concept of adding images Understand the table creation.	PO1, PO2, PO3, PO4, PO5, PO6

Textbooks

1. "Mastering HTML5 and CSS3 Made Easy", TeachUComp Inc., 2014.
2. Thomas Michaud, "Foundations of Web Design: Introduction to HTML & CSS"

Web Resources

1. https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf

2.	https://www.w3schools.com/html/default.asp

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	2	3	3	3
CO 3	2	3	3	3	3	3
CO 4	3	3	3	3	3	3
CO 5	3	3	3	2	3	3
Weightage of course contributed to each PSO	14	15	14	14	15	15

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