D.K.M. COLLEGE FOR WOMEN(AUTONOMOUS)

VELLORE-1

(REACCREDITED BY NAAC WITH 'A' GRADE)

DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS

UG-B.Sc COMPUTER SCIENCE DEGREE

TEMPLATE AND SYLLABUS

2024-2025

1. Introduction

B.Sc. Computer Science

Education is the key to development of any society. Role of higher education is crucial for securing right kind of employment and also to pursue further studies in best available world class institutes elsewhere within and outside India. Quality education in general and higher education in particular deserves high priority to enable the young and future generation of students to acquire skill, training and knowledge in order to enhance their thinking, creativity, comprehension and application abilities and prepare them to compete, succeed and excel globally. Learning Outcomes-based Curriculum Framework (LOCF) which makes it student-centric, interactive and outcome-oriented with well-defined aims, objectives and goals to achieve. LOCF also aims at ensuring uniform education standard and content delivery across the state which will help the students to ensure similar quality of education irrespective of the institute and location.

Computer Science is the study of quantity, structure, space and change, focusing on problem solving, application development with wider scope of application in science, engineering, technology, social sciences etc. throughout the world in last couple of decades and it has carved out a space for itself like any other disciplines of basic science and engineering. Computer science is a discipline that spans theory and practice and it requires thinking both in abstract terms and in concrete terms. Nowadays, practically everyone is a computer user, and many people are even computer programmers. Computer Science can be seen on a higher level, as a science of problem solving and problem solving requires precision, creativity, and careful reasoning. The ever-evolving discipline of computer science also has strong connections to other disciplines. Many problems in science, engineering, health care, business, and other areas can be solved effectively with computers, but finding a solution requires both computer science expertise and knowledge of the particular application domain. Computer science has a wide range of specialties. These include Computer Architecture, Software Systems, Graphics, Artificial Intelligence, Computational Science, and Software Engineering. Drawing from a common core of computer science knowledge, each specialty area focuses on specific challenges. Computer Science is practiced by mathematicians, scientists and engineers. Mathematics, the origins of Computer Science, provides reason and logic. Science provides the methodology for learning and refinement. Engineering provides the techniques for building hardware and software.

Programme Outcome, Programme Specific Outcome and Course Outcome

B.Sc. Computer Science

Programme Educational Objectives (PEOs)

PEO1: Attain Academic and Professional Excellence

Build a strong academic foundation and skill set that will enable success in higher education, competitive examinations, teaching, research, industry, and entrepreneurial ventures.

PEO2: Emerge as Empowered Individuals

Develop into confident, self-reliant, and economically independent women capable of applying scientific knowledge to enhance personal growth, family welfare, and community development.

PEO3: Advance Research and Innovation

Demonstrate the ability to investigate real-world challenges and contribute contextually relevant, research-driven, and innovative solutions across scientific disciplines.

PEO4: Uphold Ethical and Cultural Values

Adhere to high ethical standards, respect cultural diversity, and engage responsibly in scientific practices that contribute to a just and inclusive society.

PEO5: Respond to Societal and National Needs

Utilize scientific understanding to support public health, environmental conservation, and technological advancement, fostering inclusive regional and national progress.

PEO6: Exhibit Leadership and Social Responsibility

Lead scientific and community initiatives with integrity, inspire collaborative action, and actively contribute to positive social transformation at local and global levels.

PEO7: Engage in Lifelong and Global Learning

Pursue continuous personal and professional development while staying abreast of global trends, innovations, and interdisciplinary scientific advancements.

Programme Outcomes (POs)

PO1: Comprehend and Apply Scientific Knowledge

Acquire and apply core knowledge from scientific disciplines to understand natural phenomena, solve complex problems, and support innovation across various domains of life and industry.

PO2: Demonstrate Analytical and Critical Thinking

Develop the ability to think critically and analytically by formulating hypotheses, interpreting experimental results, evaluating scientific literature, and drawing evidence-based conclusions.

PO3: Exhibit Technical and Laboratory Competency

Gain proficiency in laboratory techniques, handling of scientific instruments, and use of software tools, while adhering to safety protocols, accuracy, and reproducibility in experimental work.

PO4: Communicate Effectively

Present scientific concepts and findings clearly and coherently through oral presentations, technical writing, and the use of digital tools, adapting to both academic and professional contexts.

PO5: Uphold Ethical Values and Environmental Consciousness

Integrate ethical principles and environmental awareness into scientific practices, promoting sustainable solutions and a sense of accountability towards society and nature.

PO6: Engage in Lifelong Learning

Cultivate an inquisitive mindset and adaptability to emerging scientific advancements, technologies, and interdisciplinary approaches, thereby remaining relevant and competent throughout life.

PO7: Collaborate and Lead in Scientific and Social Contexts

Participate effectively in collaborative scientific projects and community-based activities, demonstrating leadership, decision-making, and commitment to women’s empowerment and societal progress.

💻 Programme Specific Outcomes – B.Sc. Computer Science

Upon successful completion, graduates will be able to:

PSO1: Apply Fundamental Concepts of Computer Science

Demonstrate a sound understanding of programming languages, data structures, operating systems, and computer architecture to solve computational problems effectively.

PSO2: Develop Efficient Software Solutions

Design, implement, and optimize algorithms and data-centric solutions tailored for real-world applications using structured and object-oriented paradigms.

PSO3: Gain Proficiency in Tools and Technologies

Acquire hands-on skills in development tools, databases, and platforms such as Java, Python, MySQL, and open-source environments to support practical and innovative software development.

PSO4: Understand Socio-Ethical Dimensions of Computing

Apply computing knowledge responsibly, emphasizing digital ethics, cybersecurity, and the societal impact of software systems and automation.

PSO5: Prepare for Competitive Careers and Higher Education

Be equipped to pursue M.Sc., MCA, and qualify for jobs in software development, data handling, IT services, and public sector IT roles.

PSO6: Empower Women through Technology

Leverage computing knowledge to address gender-specific challenges, promote digital literacy, and support technology-driven social entrepreneurship.

PSO7: Communicate Effectively and Collaborate Professionally

Demonstrate the ability to work in teams, lead small projects, and convey technical ideas clearly through oral, written, and digital media.

Choice Based Credit System (CBCS), Learning Outcomes Based Curriculum Framework (LOCF) Guideline Based Credit and Hours Distribution System

B.Sc. Computer Science Curriculum Design

First Year

Semester-I

Part	List of Courses	Credit	Hours per week (L/T/P)	CIA	Uni. Exam	Total
Part-I	Language – Tamil	3	6	25	75	100
Part-II	English	3	6	25	75	100
Part-III	CC1 - Python Programming	5	5	25	75	100
	CC2 - Practical : Python Programming Lab	5	5	25	75	100
	Elective Course - EC1 1. Numerical Methods – I 2. Discrete Mathematics - I	3	4	25	75	100
Part-IV	Skill Enhancement Course- SEC-1 (Non Major Elective)- Fundamentals of Information Technology	2	2	25	75	100
	Foundation Course FC - Problem Solving Techniques	2	2	25	75	100
		23	**30**	**175**	**525**	**700**

Semester-II

Part	List of Courses	Credit	Hours per week(L/T/P)	CIA	Uni. Exam	Total
Part-I	Language -Tamil	3	6	25	75	100
Part-II	English	3	6	25	75	100
Part-III	CC3 - Data Structure and Algorithms	5	5	25	75	100
	CC4 - Practical: Data Structure and Algorithms Lab	5	5	25	75	100
	Elective Course - EC2 1. Numerical Methods – II	3	4	25	75	100

	2. Discrete Mathematics – II					
Part-IV	Skill Enhancement Course- SEC-2 (Non Major Elective) – Office Automation	2	2	25	75	100
	Skill Enhancement Course – SEC-3 Introduction to HTML	2	2	25	75	100
		23	**30**	**175**	**525**	**700**

Second Year

Semester-III

Part	List of Courses	Credit	Hours per week(L/T/P)	**CIA**	**Uni. Exam**	**Total**
Part-I	Language – Tamil	3	6	25	75	100
Part-II	English	3	6	25	75	100
Part-III	CC5- Microprocessor and Microcontroller	5	5	25	75	100
	CC6 - Practical: Microprocessor and Microcontroller Lab	5	5	25	75	100
	Elective Course – EC3 1. Statistical Methods and their Applications – I 2. Mathematical Statistics – I	3	4	25	75	100
Part-IV	Skill Enhancement Course -SEC-4 (Entrepreneurial Based) – Understanding Internet	1	1	25	75	100
	Skill Enhancement Course -SEC-5 – Multimedia Systems	2	2	25	75	100
	Environmental Studies	-	1	-	-	-
		22	**30**	**175**	**525**	**700**

Semester-IV

Part	**List of Courses**	**Credit**	**Hours per week (L/T/P)**	**CIA**	**Uni. Exam**	**Total**
Part-I	Language - Tamil	3	6	25	75	100
Part-II	English	3	6	25	75	100
Part-III	CC7 - Java Programming	5	5	25	75	100
	CC8 - Practical: Java Programming Lab	5	5	25	75	100

	Elective Course - EC4 1. Statistical Methods and their Applications – II 2. Mathematical Statistics - II	3	3	25	75	100
Part-IV	Skill Enhancement Course – SEC-6 - Quantitative Aptitude	2	2	25	75	100
	Skill Enhancement Course - SEC-7 – PHP Programming	2	2	25	75	100
	Environmental Studies	2	1	25	75	100
		25	**30**	**200**	**600**	**800**

Third Year

Semester-V

Part	List of Courses	Credit	Hours per week (L/T/P)	CIA	Uni. Exam	Total
Part-III	CC9 - Software Engineering	4	5	25	75	100
	CC10 - Database Management System	4	5	25	75	100
	CC11 - Practical: Database Management System Lab	4	5	25	75	100
	Elective Course – EC5 1. Cloud Computing 2. Image Processing	3	4	25	75	100
	Elective Course – EC6 1. IOT and its Applications 2. Software Project Management	3	4	25	75	100
	CC12 - Core /Project with Viva voce	4	5	25	75	100
Part-IV	Value Education	2	2	25	75	100
	Internship / Industrial Training (Summer vacation at the end of IV semester activity)	2		25	75	100
		26	**30**	**200**	**600**	**800**

Semester-VI

Part	List of Courses	Credit	Hours per week (L/T/P)	CIA	Uni. Exam	Total
Part-III	CC13 - Computer Networks	4	6	25	75	100
	CC14 - .NET Programming	4	6	25	75	100
	CC15 - Practical: .NET Programming Lab	4	6	25	75	100
	Elective Course – EC7 1. Robotics and its Applications 2. Cryptography	3	5	25	75	100
	Elective Course – EC8 1. Big Data Analytics 2. Artificial Intelligence	3	5	25	75	100
Part-IV	Professional Competency Skill Enhancement Course SEC8	2	2	25	75	100
Part -V	Extension Activity	1	-	-	-	100
		21	**30**	**150**	**450**	**700**

Total Credits: 140

TOTAL CREDITS

B.Sc COMPUTER SCIENCE

Part	Subject	Papers	Credit	Total credits	Marks	Total Marks
I	Language	4	3	12	100	400
II	English	4	3	12	100	400
III	Elective EC	8	3	24	100	800
III	Core theory	8	4x5=20 4x4=16	36	100	800
	Core Practicals	6	4x5=20	28	100	600

			2x4=08			
III	Project	1	4	4	100	100
IV	EVS	1	2	2	100	100
IV	VE	1	2	2	100	100
IV	Skill Enhancement Course	7	6x2=12 1x1=1	13	100	700
IV	Foundation Course	1	2	2	100	100
IV	Professional Competency Skill	1	2	2	100	100
IV	Internship	1	1	2	100	100
V	Extension activity	1	1	1	100	100
Total				**140**		**4400**

SEMESTER-I

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
CC1	PYTHON PROGRAMMING		5	-	-	-	5	25	75	100

	Learning Objectives	
CO1	To make students understand the concepts of Python programming.	
CO2	To apply the OOPs concept in PYTHON programming.	
CO3	To impart knowledge on demand and supply concepts	
CO4	To make the students learn best practices in PYTHON programming	
CO5	To know the costs and profit maximization	
UNIT	**Contents**	**No. ofHours**
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. **Python Arrays:** Defining and Processing Arrays – Array methods.	**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 –	**15**
	Modules and Namespace – Defining our own modules.	

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

Text books

1	Reema Thareja, ― Python Programming using problem solving approach ‖, First Edition, 2017, Oxford University Press.
2	Dr. R. Nageswara Rao, ― Core Python Programming‖, First Edition, 2017, Dreamtech Publishers.

Reference Books

1.	Vamsi Kurama, ― 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	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**2**	**2**	**3**	**3**	**3**
CO2	**3**	**2**	**2**	**3**	**2**	**3**
CO3	**3**	**2**	**2**	**3**	**2**	**2**
CO4	**3**	**2**	**2**	**3**	**2**	**3**
CO5	**3**	**2**	**2**	**3**	**3**	**3**
Weightage of course contributed to each PSO	15	10	10	15	13	14

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

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
CC2	PYTHON PROGRAMMING LAB		-	-	5	-	5	25	75	100

Course Objectives:

1. Be able to design and program Python applications.
2. Be able to create loops and decision statements in Python.
3. Be able to work with functions and pass arguments in Python.
4. Be able to build and package Python modules for reusability.
5. 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 Arrays. 9. Program using Strings. 10. Program using Modules. 11. Program using Lists. 12. Program using Tuples. 13. Program using Dictionaries. 14. Program for File Handling.	**75**

Course Outcomes

On completion of this course, students will

CO1	Demonstrate the understanding of syntax and semantics of
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	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	2	2	2	3	2
CO2	2	1	3	2	-	2
CO3	3	3	1	1	1	2
CO4	2	3	3	1	-	1
CO5	3	2	3	1	1	-
Weightage of course contributed to each PSO	12	11	12	7	5	7

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

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
	FUNDAMENTALS OF INFORMATION TECHNOLOGY	**SEC –I NME**	2	-	-		2	25	75	100

Learning Objectives

CO1	Understand basic concepts and terminology of information technology.
CO2	Have a basic understanding of personal computers and their operation
CO3	Be able to identify data storage and its usage
CO4	Get great knowledge of software and its functionalities
CO5	Understand about operating system and their uses

UNIT	Contents	No. Of. Hours
I	**Introduction to Computers:** Introduction, Definition, Characteristics of computer, Evolution of Computer, Block Diagram Of a computer, Generations of Computer, Classification Of Computers, Applications of Computer, Capabilities and limitations of computer	**6**
II	**Basic Computer Organization:** Role of I/O devices in a computer system. Input Units: Keyboard, Terminals and its types. Pointing Devices, Scanners and its types, Voice Recognition Systems, Vision Input System, Touch Screen, Output Units: Monitors and its types. Printers: Impact Printers and its types. Non Impact Printers and its types, Plotters, types of plotters, Sound cards, Speakers.	**6**
III	**Storage Fundamentals:** Primary Vs Secondary Storage, Data storage & retrieval methods. Primary Storage: RAM ROM, PROM, EPROM, EEPROM. Secondary Storage: Magnetic Tapes, Magnetic Disks. Cartridge tape, hard disks, Floppy disks Optical Disks, Compact Disks, Zip Drive, Flash Drives	**6**
IV	**Software:** Software and its needs, Types of S/W. System Software: Operating System, Utility Programs Programming Language: Machine Language, Assembly Language, High Level Language their advantages & disadvantages. Application S/W and its types: Word Processing, Spread Sheets Presentation, Graphics, DBMS s/w	**6**

V	**Operating System:** Functions, Measuring System Performance, Assemblers, Compilers and Interpreters. Batch Processing, Multiprogramming, Multi Tasking, Multiprocessing, Time Sharing, DOS, Windows, Unix/Linux.	**6**
	TOTAL HOURS	**30**

Course Outcomes		**Programme Outcomes**
CO	On completion of this course, students will	
CO1	Learn the basics of computer, Construct the structure of the required things in computer, learn how to use it.	PO1, PO2, PO3, PO4, PO5, PO6
CO2	Develop organizational structure using for the devices present currently under input or output unit.	PO1, PO2, PO3, PO4, PO5, PO6
CO3	Concept of storing data in computer using two header namely RAM and ROM with different types of ROM with advancement in storage basis.	PO1, PO2, PO3, PO4, PO5, PO6
CO4	Work with different software, Write program in the software and applications of software.	PO1, PO2, PO3, PO4, PO5, PO6
CO5	Usage of Operating system in information technology which really acts as a interpreter between software and hardware.	PO1, PO2, PO3, PO4, PO5, PO6

Textbooks

1	Anoop Mathew, S. Kavitha Murugeshan (2009), " Fundamental of Information Technology", Majestic Books.
2	Alexis Leon, Mathews Leon," Fundamental of Information Technology", 2nd Edition.
3	S. K Bansal, "Fundamental of Information Technology".

Reference Books

1.	Bhardwaj Sushil Puneet Kumar, "Fundamental of Information Technology"
2.	GG WILKINSON, "Fundamentals of Information Technology", Wiley-Blackwell
3.	A Ravichandran , "Fundamentals of Information Technology", Khanna Book Publishing

Web Resources

1.	https://testbook.com/learn/computer-fundamentals
2.	https://www.tutorialsmate.com/2020/04/computer-fundamentals-tutorial.html
3.	https://www.javatpoint.com/computer-fundamentals-tutorial
4.	https://www.tutorialspoint.com/computer_fundamentals/index.htm
5.	https://www.nios.ac.in/media/documents/sec229new/Lesson1.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	Inst. Hours	Marks		
									CIA	External	Total
FC	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:**	**6**

	One Dimensional Array - Two Dimensional Arrays – Strings as Arrays of Characters.	
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

Semester II

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
	DATA STRUCTURES AND ALGORITHMS	**CC III**	5	-	-		5	25	75	100

Learning Objectives	
LO1	Understand the meaning asymptotic time complexity analysis and various data structures
LO2	To enhancing the problem solving skills and thinking skills
LO3	To write efficient algorithms and Programs
LO4	To make the students learn best practices in PYTHON programming
LO5	To understand how to handle the files in Data Structure

UNIT	Contents	No. Of. Hours
I	**Arrays and ordered Lists** Abstract data types – asymptotic notations – complexity analysis- Linked lists: Singly linked list – doubly linked lists - Circular linked list, General lists- stacks – Queues – Circular Queues – Evaluation of expressions	**15**
II	**Trees and Graphs** Trees – Binary Trees – Binary Tree Traversal – Binary Tree Representations – Binary Search Trees - threaded Binary Trees - Application of trees (Sets). Representation of Graphs – Graph implementation – graph Traversals - Minimum Cost Spanning Trees – Shortest Path Problems-Application of graphs	**15**
III	**Searching and Sorting** Sorting – Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Selection Sort. Searching – Linear search, Binary search	**15**
IV	**Greedy Method and Dynamic programming** Greedy Method: Knapsack problem– Job Sequencing with deadlines – Optimal storage on tapes. General method – Multistage Graph Forward Method– All pairs shortest path – Single source shortest path – Search Techniques for Graphs – DFS – Connected Components – Bi-Connected Components	**15**
V	**Backtracking** General Method – 8-Queen‟s – Sum Of Subsets – Graph Colouring – Hamiltonian Cycles – Branch And Bound: General Method – Travelling Sales Person Problem	**15**
	TOTAL HOURS	**75**

Course Outcomes		**Programme Outcomes**
CO	On completion of this course, students will	
	To understand the asymptotic notations and analysis of time and space	PO1, PO2, PO3,

CO1	Complexity To understand the concepts of Linked List, Stack and Queue.	PO4, PO5, PO6
CO2	To understand the Concepts of Trees and Graphs Perform traversal operations on Trees and Graphs. To enable the applications of Trees and Graphs.	PO1, PO2, PO3, PO4, PO5, PO6
CO3	To apply searching and sorting techniques	PO1, PO2, PO3, PO4, PO5, PO6
CO4	To understand the concepts of Greedy Method To apply searching techniques.	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	Seymour Lipshutz(2011),Schaum‟s Outlines - Data Structures with C, Tata McGraw Hill publications.
2	Ellis Horowitz and SartajSahni (2010), Fundamentals of Computer Algorithms, Galgotia Publications Pvt., Ltd.
3	Dr. K. Nagesware Rao, Dr. Shaik Akbar, ImmadiMurali Krishna, Problem Solving and Python Programming(2018)

Reference Books

1.	Gregory L.Heileman(1996), Data Structures, Algorithms and Object-Oriented Programming, McGraw Hill International Edition, Singapore.
2.	A.V.Aho, J.D. Ullman, J.E.Hopcraft(2000). Data Structures and Algorithms, Addison Wesley Publication.
3.	Ellis Horowitz and SartajSahni, Sanguthevar Raja sekaran (2010) ,Fundamentals of Computer Algorithms, Galgotia Publications Pvt.Ltd.

Web Resources

1.	https://www.tutorialspoint.com/data_structures_algorithms/index.htm
2.	https://www.programiz.com/dsa
3.	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	3	3	3	3
CO 3	3	3	3	3	1	3
CO 4	3	3	3	3	3	3
CO 5	3	3	3	3	3	2
Weightage of course contributed to each PSO	15	15	15	15	13	14

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

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
	DATA STRUCTURES AND ALGORITHMS LAB	**CC IV**	-	-	5		5	25	75	100

Objectives

To predict the performance of different algorithms in order to guide design decisions, provide theoretical estimation for the required resources of an algorithm to solve a specific computational problem

LIST OF PROGRAMS	**Required Hour**
1. Perform stack operations 2. Perform queue operations 3. Perform tree traversal operations 4. Search an element in an array using linear search. 5. Search an element in an array using binary search 6. Sort the given set of elements using Merge Sort. 7. Sort the given set of elements using Quick sort. 8. Search the Kth smallest element using Selection Sort 9. Find the Optimal solution for the given Knapsack Problem using Greedy Method. 10. Find all pairs shortest path for the given Graph using Dynamic Programming method 11. Find the Single source shortest path for the given Travelling Salesman problem using Dynamic Programming method 12. Find all possible solution for an N Queen problem using backtracking method 13. Find all possible Hamiltonian Cycle for the given graph using backtracking method	**75**

Course Outcomes	
CO	On completion of this course, students will
CO1	To understand the concepts of Linked List, Stack and Queue.
CO2	Concepts of Trees and Graphs. Perform traversal operations on Trees and Graphs. To enable the applications of Trees and Graphs.
CO3	To apply searching and sorting techniques
CO4	To determine the concepts of Greedy Method To apply searching techniques.
CO5	Usage of File handlings in python, Concept of reading and writing files, Do programs using files.

LearningResources:

- **RecommendedTexts**

1. Ellis Horowitz , Sartaj Sahni, Susan Anderson Freed, Second Edition , "Fundamentals of Data in C", Universities Press

2. E. Horowitz, S. Sahni and S. Rajasekaran, Second Edition ,"Fundamentals of Computer Algorithms " Universities Press

- **ReferenceBooks**

1. Seymour Lipschutz ,"Data Structures with C", First Edition, Schaum's outline series in computers, Tata McGraw Hill.
2. .2. R.Krishnamoorthy and G.Indirani Kumaravel, Data Structures using C, Tata McGrawHill – 2008.
3. A.K.Sharma, Data Structures using C , Pearson Education India,2011.
4. . G. Brassard and P. Bratley, "Fundamentals of Algorithms", PHI, New Delhi, 1997.
5. 4, . A.V. Aho, J.E. Hopcroft, J.D. Ullmann,, "The design and analysis of Computer
6. Algorithms", Addison Wesley, Boston, 1974
7. 5. Thomas H. Cormen, C.E. Leiserson, R L.Rivest and C. Stein, Introduction to Algorithms, Third edition, MIT Press, 2009
8. Sanjoy Dasgupta, C.Papadimitriou and U.Vazirani , Algorithms , Tata McGraw-Hill, 2008.

Course Outcomes

CO	On completion of this course, students will
CO1	Implement data structures using C
CO2	Implement various types of linked lists and their applications
CO3	Implement Tree Traversals
CO4	Implement various algorithms in C
CO5	Implement different sorting and searching algorithms

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

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

Medium-2 L-Low-1

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst.Hours	Marks		
									CIA	External	Total
	OFFICE AUTOMATION	Specific Elective	2	-	-	-	2	2	25	75	100

Course Objective	
CO1	Understand the basics of computer systems and its components.
CO2	Understand and apply the basic concepts of a word processing package.
CO3	Understand and apply the basic concepts of electronic spreadsheet software.
CO4	Understand and apply the basic concepts of database management system.
CO5	Understand and create a presentation using PowerPoint tool.

UNIT	**Details**	**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, analysis tables, 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 data files; 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 type casting & 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	
1	Possess the knowledge on the basics of computers and its components	PO1,PO2,PO3,PO6,PO8
2	Gain knowledge on Creating Documents, spreadsheet and presentation.	PO1,PO2,PO3,PO6

3	Learn the concepts of Database and implement the Query in Database.	PO3,PO5,PO7
4	Demonstrate the understanding of different automation tools.	PO3,PO4,PO5,PO7
5	Utilize the automation tools for documentation, calculation and presentation purpose.	PO4,PO6,PO7,PO8
Text Book		
1	Peter Norton, ―Introduction to Computers‖ – Tata McGraw - Hill.	
Reference Books		
1.	Jennifer Ackerman Kettel, Guy Hat - Davis, Curt Simmons, ― Microsoft 2003‖, Tata McGraw Hill.	
Web Resources		
1.	https://www.udemy.com/course/office-automation-certificate-course/	
2.	https://www.javatpoint.com/automation-tools	

Mapping with Programme Outcomes:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**2**	**2**	**2**	**3**	**3**	**1**
CO2	**3**	**1**	**2**	**3**	**3**	**3**
CO3	**3**	**2**	**1**	**2**	**1**	**3**
CO4	**3**	**3**	**2**	**2**	**2**	**1**
CO5	**2**	**2**	**1**	**3**	**1**	**3**
Weightage of course contributed to each PSO	13	10	8	13	10	11

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

Subject Code	Subject Name	Category	L	T	P	S	Credits	Marks		
								CIA	External	Total
	INTRODUCTION TO HTML	Specific Elective	2	-	-		2	25	75	100

Learning Objectives	
CO1	Insert a graphic within a webpage.
CO2	Create a link within a webpage.
CO3	Create a table within a webpage.
CO4	Insert heading levels within a webpage.
CO5	Insert ordered and unordered lists within a webpage.Create a webpage.

UNIT	Contents	No.of. Hours
I	Introduction: Web Basics: What is Internet – Web browsers – What is Webpage –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 HTML 5 and CSS3 Made Easy‖, Teach U Comp 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	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	2	3	3	3
CO3	2	3	3	3	3	3
CO4	3	3	3	3	3	3
CO5	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

SEMESTER III

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
CC5	**Microprocessor and Microcontroller**	Core	5	-	-	-	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 classifications
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 -	15

	8051 Microcontroller architecture - 8051 pin description. Timers and Counters – Operating Modes- Control Registers. Interrupts – Interrupts in 8051 - Interrupts Control Register – Execution of interrupt.	
	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	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
CC6	**Microprocessor and microcontroller Lab**	Core	-	-	5	-	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 classifications	
LO3	To enable the students to write assembly language programs using 8085.	
LO4	To interface the peripheral devices to 8085 using Interrupt 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	60

	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	
	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 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 multi byte 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		
								CIA	External	Total
	UNDERSTANDING INTERNET	Skill Enhancement Course	1	-	-		1	25	75	100

Learning Objectives	
CO1	Knowledge of Internet medium
CO2	Internet as a mass medium
CO3	Features of Internet Technology,
CO4	Internet as source of infotainment
CO5	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 worldwide 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 cybercrime 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 cybercrime and future possibilities	PO1, PO2, PO3, PO4, PO5, PO6

Text books

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

Reference Book

1	Acharya, RN [1987] Television in India. Manas Publications, New Delhi.

Mapping with Programme Outcomes:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**1**	**2**	**2**	**1**	**3**	**1**
CO2	**3**	**2**	**2**	**3**	**1**	**3**
CO3	**3**	**2**	**3**	**1**	**1**	**3**
CO4	**3**	**3**	**2**	**2**	**2**	**1**
CO5	**3**	**2**	**1**	**3**	**3**	**3**
Weightage of course contributed to each PSO	13	11	10	10	10	11

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

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	Multimedia Systems	Skill Enhancement Course	2	-	-	-	2	2	25	75	100

Learning Objective	
CO1	Understand the definition of Multimedia
CO2	To study about the Image File Formats, Sounds Audio File Formats
CO3	Understand the concepts of Animation and Digital Video Containers
CO4	To study about the Stage of Multimedia Project
CO5	Understand the concept of Ownership of Content Created for Project Acquiring Talent

UNIT	Details	No. of Hours
I	Multimedia Definition-Use of Multimedia-Delivering Multimedia- Text: About Fonts and Faces - Using Text in Multimedia - Computers and Text Font Editing and Design Tools-Hypermedia and Hypertext.	6
II	Images: Plan Approach – Organize Tools-Configure Computer Workspace – Making Still Images - Color - Image File Formats. Sound: The Power of Sound- Digital Audio- Midi Audio-Midi vs. Digital Audio- Multimedia System Sounds Audio File Formats - Vaughan's Law of Multimedia Minimums-Adding Sound to Multimedia Project	6
III	Animation: The Power of Motion-Principles of Animation – Animation by Computer -Making Animations that Work. Video: Using Video -Working with Video and Displays – Digital Video Containers - Obtaining Video Clips – Shooting and Editing Video	6
IV	Making Multimedia: The Stage of Multimedia Project-The Intangible Needs -The Hardware Needs - The Software Needs – An Authoring Systems Needs - Multimedia Production Team.	6
V	Planning and Costing: The Process of Making Multimedia – Scheduling – Estimating -RFPs and Bid Proposals. Designing and Producing- Content and Talent: Acquiring Content -Ownership of Content Created for Project-Acquiring Talent	6
	Total	**30**

Course Outcomes		**Programme Outcomes**
CO	On completion of this course, students will	
1	understand the concepts, importance, application and the process of developing multimedia	PO1

2	to have basic knowledge and understanding about image related processings	PO1,PO2
3	To understand the framework of frames and bit images to animations	PO4,PO6
4	Speaksaboutthemultimediaprojectsandstagesofrequirementi nphasesofproject.	PO4,PO5,PO6
5	Understanding the concept of cost involved in multimedia planning, designing, and producing	PO3,PO8
Text Book		
1	TayVaughan,"Multimedia:MakingItWork",8thEdition,Osborne/McGraw-Hill,2001.	
Reference Books		
1.	Ralf Steinmetz & Klara Nahrstedt "Multimedia Computing, Communication & Applications", Pearson Education, 2012.	
Web Resources		
1.	https://www.geeksforgeeks.org/multimedia-systems-with-features-or-characteristics/	

Mapping with Programme Outcomes:

CO/PSO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**
CO1	**3**	**2**	**3**	**3**	**2**	**1**
CO2	**3**	**2**	**3**	**3**	**2**	**1**
CO3	**3**	**2**	**3**	**3**	**2**	**1**
CO4	**3**	**2**	**3**	**3**	**1**	**1**
CO5	**3**	**3**	**3**	**3**	**1**	**1**
Weightage of course contributed to each PSO	15	11	15	15	8	5

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

SEMESTER IV

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
CC7	**JAVA Programming**	Core	5	-	-	-	5	5	25	75	100

Learning Objectives	
CO1	To provide fundamental knowledge of object-oriented programming
CO2	To equip the student with programming knowledge in Core Java from the basics up.
CO3	To enable the students to use AWT controls, Event Handling and Swing for GUI.
CO4	To provide fundamental knowledge of object-oriented programming.
CO5	To equip the student with programming knowledge in Core Java from the basics up.

UNIT	Details	No. of Hours
I	**Introduction:** Review of Object Oriented concepts- History of Java – Java buzzwords – JVM architecture - Datatypes – Variables - Scope and life time of variables-arrays - operators - control statements-type conversion and casting – simple java program-constructors - methods - Static block - Static Data -Static Method String and String Buffer Classes.	15
II	**Inheritance**: Basic concepts - Types of inheritance - Member access rules - Usage of this and Super keyword-Method Overloading – Method overriding-Abstract classes - Dynamic method dispatch - Usage of final keyword. **Packages**: Definition-Access Protection - Importing Packages. **Interfaces**: Definition–Implementation–Extending	15

	Interfaces. **Exception Handling:** try–catch- throw - throws–finally– Built- in exceptions- Creating own Exception classes.	
III	**Multithreaded Programming**: Thread Class- Runnable interface – Synchronization–Using synchronized methods – Using synchronized statement-Inter thread Communication–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,PO7
CO4	Implement AWT and Event handling.	PO2,PO6
CO5	Use Swing to create GUI.	PO1,PO3,PO8
TextBooks:		
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	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**2**	**-**	**2**	**2**	**2**
CO2	**3**	**1**	**2**	**1**	**2**	**2**
CO3	**1**	**-**	**2**	**2**	**2**	**2**
CO4	**2**	**2**	**2**	**2**	**2**	**2**
CO5	**1**	**2**	**-**	**2**	**2**	**2**
Weightage of course Contributed to each PSO	10	7	6	9	10	10

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

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
CC8	**JAVA Programming Lab**	Core	-	-	5	-	5	5	25	75	100

Learning Objective	
CO1	To provide fundamental knowledge of object-oriented programming.
CO2	To equip the student with programming knowledge in Core Java from the basics up.
CO3	To enable the students to know about Event Handling.
CO4	To enable the students to use String Concepts.
CO5	To equip the student with programming knowledge into create GUI using AWT controls.

UNIT	**Details**	
1	Write a Java program that prompts the user for an integer and then prints out all the prime numbers upto 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 Character Array 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 1 to 10 using Thread 1 and to print 90 to100 using Thread 2.	
10	Write a program to demonstrate the use of following exceptions. a. Arithmetic Exception b. NumberFormatException 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 readable, whether the file is writable, the type of file and the length of the file in bytes	
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. Onselecting 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,PO8

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	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**2**	**1**	**3**	**2**	**3**
CO2	**3**	**2**	**1**	**3**	**1**	**3**
CO3	**3**	**2**	**1**	**3**	**2**	**3**
CO4	**3**	**2**	**1**	**3**	**2**	**3**
CO5	**3**	**2**	**1**	**3**	**2**	**3**
Weightage of course contributed to each PSO	15	10	5	15	9	15

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

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	Quantitative Aptitude	Skill Enhancement Course	2	-	-	-	2	2	25	75	100

Learning Objective	
CO1	To understand the basic concepts of numbers
CO2	Understand and apply the concept of percentage, profit & loss
CO3	To study the basic concepts of time and work, interests
CO4	To learn the concepts of permutation, probability, discounts
CO5	To study about the concepts of data representation, graphs

UNIT	**Details**	**No.of Hours**
I	Numbers-HCF and LCM of numbers-Decimal fractions-Simplification-Square root and cube roots – Average – problems on Numbers.	6
II	Problems on Ages – Surds and Indices - percentage -profits and loss – ratio and proportion – partnership -Chain rule.	6
III	Time and work – pipes and cis terns – Time and Distance - Problems on trains – Boats and streams – simple interest - Compound interest – Logarithms – Area – Volume and surface area – races and Games of skill.	6
IV	Permutation and combination – probability - True Discount – Bankers Discount – Height and Distances – Odd man out & Series.	6
V	Calendar-Clocks-stocks and shares- Data representation - Tabulation – Bar Graphs- Pie charts – Line graphs.	6
	Total	**30**

Course Outcomes		**Programme Outcome**
CO	On completion of this course, students will	
1	Understand the concepts, application and the problems of numbers	PO1
2	To have basic knowledge and understanding about percentage, profit & loss related processings	PO1,PO2

3	To understand the concepts of time and work	PO4,PO6
4	Speaks about the concepts of probability, discount	PO4,PO5,PO6
5	Understanding the concept of problem solving involved in stocks& shares, graphs	PO3,PO8
Text Book		
1	–Quantitative Aptitude ‖ ,R.S. AGGARWAL., S. Chand & Company Ltd.,	
Reference Books		
1.		
Web Resources		
1.	https://www.javatpoint.com/aptitude/quantitative	
2.	https://www.toppr.com/guides/quantitative-aptitude/	

Mapping with Programme Outcomes:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**2**	**3**	**1**	**2**	**-**	**2**
CO2	**2**	**2**	**2**	**3**	**3**	**1**
CO3	**3**	**2**	**2**	**2**	**3**	**3**
CO4	**3**	**2**	**3**	**2**	**3**	**3**
CO5	**2**	**3**	**1**	**2**	**3**	3
Weightage of course Contributed to each PSO	12	12	9	11	12	12

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

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	PHP PROGRAMMING	Skill Enhancement Course	2				2	2	25	75	100

Learning Objective	
CO1	To provide the necessary knowledge on basics of PHP.
CO2	To design and develop dynamic, database – driven web applications using PHP version.
CO3	To get an experience on various web application development techniques.
CO4	To learn the necessary concepts for working with the files using PHP.
CO5	To get a knowledge on OOPS with PHP.

UNIT	**Details**	**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	
1	Write PHP scripts to handle HTML forms	PO1,PO4,PO6,PO8.
2	Write regular expressions including modifiers, operators, and meta characters.	PO2,PO5,PO7.
3	Create PHP Program using the concept of array.	PO3,PO6,PO8.
4	Create PHP programs that use various PHP	PO2,PO3,PO5,PO8.

	Library functions	
5	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 CSS 3, JavaScript, XML, XHTML, AJAX, PHP, jQuery) ǁ, Paperback 2016, 2nd Edition.	
Web Resources		
1.	Refer MOOC Courses like NPTEL and SWAYAM	
2.	https://www.w3schools.com/php/default.asp	

Mapping with Programme Outcomes:

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**1**	**1**	**-**	**1**
CO2	**2**	**-**	**1**	**1**	**2**	**1**
CO3	**3**	**3**	**1**	**1**	**-**	**1**
CO4	**1**	**3**	**2**	**1**	**-**	**1**
CO5	**3**	**2**	**1**	**1**	**-**	**1**
Weightage of course contributed to each PSO	12	11	6	5	2	5

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