



K L Deemed to be University
Department of Computer Science and Engineering-Honors -- KLVZA
Course Handout
2021-2022, Odd Sem

Course Title	: COMPUTATIONAL THINKING FOR STRUCTURED DESIGN
Course Code	: 21SC1101
L-T-P-S Structure	: 3-0-2-6
Pre-requisite	:
Credits	: 5.5
Course Coordinator	: Sreeram Nimmagadda
Team of Instructors	:
Teaching Associates	:

Syllabus : Structured Programming Paradigm: Problem Solving Approach, Algorithms and Algorithm Analysis, Program Development Steps, Structure of C Program, Pre-Processor Directives, Design of Building Blocks for solving real world problems: Modularization: Functions, Scope of Variables and Storage classes, Data Types: Primitive, Extended and Derived Including Pointers, Operators: Types of operators, Precedence, Associativity, User I/O: Formatted I/O, Command line arguments, Redirecting I/O: Files and File Operations. Logic Design for Computational Thinking: Control Flow Statements: Decision Making using conditional statements, Definite and indefinite Iterative statements. Recursion, logic building using complex building blocks. CRUD operations on Basic Data Structures: Basic Data Structure: Arrays, 2-D Arrays, Dynamic Memory Allocation Searching: Linear Search and Binary Search Sorting: Bubble Sort CRUD operations on Linear Data Structures: Stacks, Queues and Single Linked List. Introduction to Trees.

Text Books : 1. Brian W. Kernighan, Dennis M. Ritchie, "The C Programming Language: ANSI C Version", 2/e, Prentice-Hall/Pearson Education-2005. 2. E. Balagurusamy, "Programming in ANSI C" 4th ed., Tata McGraw-Hill Education, 2008. 3. R. F. Gilberg, B. A. Forouzan, "Data Structures", 2nd Edition, Thomson India Edition-2005.

Reference Books : 1. Mark Allen weiss, Data Structures and Algorithm Analysis in C, 2008, Third Edition, Pearson Education. 2. Horowitz, Sahni, Anderson Freed, "Fundamentals of Data structures in C", 2nd Edition-2007. 3. Robert Kruse, C. L. Tondo, Bruce Leung, Shashi Mogalla, "Data structures and Program Design in C", 4th Edition-2007. 4. C for Engineers and Scientists – An Interpretive Approach by Harry H. Cheng, Mc Graw Hill International Edition-2010. 5. Jeri R. Hanly, Elliot B. Koffman, "Problem Solving and Program Design in C", 7/e, Pearson Education-2004. 6. Jean Paul Trembley Paul G. Sorenson, "An Introduction to Data Structures with applications", 2nd Edition.

MOOCS : 1. www.hackerrank.com 2. www.codechef.com 3. www.spoj.com

Course Rationale : The course takes an imperative view of problem solving through programming using C programming language. This necessitates data abstraction, basics of data structures, and an introduction to the GNU/Linux operating system and programming the medium level language C. Student is professionally trained in algorithms, flowcharts, analysis of a problem and translating the same into a C program. The students are made to write C programs on their own for sets of both mathematical and other engineering problems after exposing them to the different constructs of C language namely Input/output, assignments, iteration, and control structures. Finally, the student is acquainted with basic data structures like stacks, queues, lists etc.

Course Objectives : The objective of the course is to equip the student with Design & problem-solving skills using C Language and associated Data Structures to provide the student details about algorithms used in typically familiar problems, and a few details about the essential ingredients of the programming language C and fundamental Data Structures.

COURSE OUTCOMES (COs):

CO NO	Course Outcome (CO)	PO/PSO	Blooms Taxonomy Level (BTL)
CO1	Design Basic and Complex Building Blocks for real world problems using structured programming paradigm	PO1,PO3	3
CO2	Apply Computational Thinking for designing solutions to real world problems	PO3,PO2	3
CO3	Develop and Analyze CRUD operations on arrays	PO2,PO3	4
CO4	Develop and Analyze CRUD operations on Linear Data Structures	PO3	4
CO5	Apply the structured programming paradigm with logic building skills on Basic and Linear Data Structures for solving real world problems	PO3	3
CO6	Skill the students in such a way that students will be able to develop logic that help them to create programs as well as applications in C	PO3	6

COURSE OUTCOME INDICATORS (COIs)::

Outcome No.	Highest BTL	COI-1	COI-2	COI-3	COI-4
CO1	3	Btl-1 Describe problem solving techniques and translate algorithm/ flowchart to a C program	Btl-2 Write programs using Complex Building blocks with different modes of user Input	Btl-3 Design modularized code with Decision making constructs in solving computational problems	
CO2	3	Btl-1 Syntactically differentiate definite and indefinite iterative statements	Btl-2 Convert among definite and indefinite iterative statements and able to write alternate logic for a given problem. convert recursive functions to iterative statements	Btl-3 Design iterative and recursive logic to solve real world problems	
CO3	4		Btl-2 Write syntactically accurate code for 1-D and 2-D Arrays, demonstrates dynamic memory allocation	Btl-3 Apply DMA to Solve real world problems and perform CRUD operations on multi-dimensional Arrays.	Btl-4 Analyse CRUD operations on multi-dimensional arrays using asymptotic notations in solving real world problems
CO4	4		Btl-2 Write syntactically accurate code for Implementing stacks, queues and SLL (with structure pointers	Btl-3 Apply CRUD operations on stacks, queues, and SLL	Btl-4 Analyse CRUD operations on Linear Data Structures using asymptotic notations
CO5	3	Btl-6 Apply the structured			

		programming paradigm with logic building skills on Basic and Linear Data Structures for solving real world problems.		
CO6	6	Btl-6 Skill the students in such a way that students will be able to develop logic that help them to create programs as well as applications in C		

PROGRAM OUTCOMES & PROGRAM SPECIFIC OUTCOMES (POs/PSOs)

Po No.	Program Outcome
PO1	Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences
PO3	Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
PO4	Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions for complex problems that cannot be solved by straightforward application of knowledge, theories and techniques applicable to the engineering discipline.
PO5	Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO6	The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice
PO9	Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
PO11	Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

PSO1	An ability to design and develop software projects as well as Analyze and test user requirements.
PSO2	An Ability to gain working Knowledge on emerging software tools and technologies.

Lecture Course DELIVERY Plan:

Sess.No.	CO	COI	Topic	Book No[CH No][Page No]	Teaching-Learning Methods	Evaluation Components
1	CO1	COI-1	Structured programming paradigm- modularization	RB1/PP:9-11	Chalk,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,End Semester Exam,Home Assignment,Lab In Semester Exam,LCE,Ratings on Global Platforms,SEM-EXAM1,Skilling Continuous Evaluation
2	CO1	COI-1	Designing Algorithms	RB1:PP:12-24	PPT	ALM,Home Assignment,Lab End Semester Exam,Lab In Semester Exam,LCE,Ratings on Global Platforms,SEM-EXAM1,Skill In-Sem Exam,Skill Sem-End Exam,Skilling Continuous Evaluation
3	CO1	COI-1	Flowcharts	RB1/PP:12-25	Chalk,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,Home Assignment,Lab End Semester Exam,LCE,SEM-EXAM1,Skill In-Sem Exam,Skill Sem-End Exam,Skilling Continuous Evaluation
4	CO1	COI-2	Data types: int, int pointer, float, float pointer, char, char pointer	T1-PP.1-46	Chalk,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,End Semester Exam,Home Assignment,Lab End Semester Exam,Lab In Semester Exam,Ratings on Global Platforms,SEM-EXAM1,Skill In-Sem Exam,Skill Sem-End Exam,Skilling Continuous Evaluation

Sess.No.	CO	COI	Topic	Book No[CH No][Page No]	Teaching-Learning Methods	Evaluation Components
5	CO1	COI-2	Data types: int array, float array, char array	T1-PP.1-46	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,Home Assignment,Lab In Semester Exam,Ratings on Global Platforms,SEM- EXAM1,Skill In-Sem Exam,Skill Sem-End Exam,Skilling Continuous Evaluation
6	CO1	COI-2	User input from console	T1- PP.370-384	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,End Semester Exam,Home Assignment,Lab End Semester Exam,Lab In Semester Exam,Ratings on Global Platforms,SEM- EXAM1,Skill In-Sem Exam,Skill Sem-End Exam,Skilling Continuous Evaluation
7	CO1	COI-3	User Input from files	T1- PP.370-384	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,End Semester Exam,Home Assignment,Lab End Semester Exam,Lab In Semester Exam,Ratings on Global Platforms,SEM- EXAM1,Skill In-Sem Exam,Skill Sem-End Exam,Skilling Continuous Evaluation
8	CO1	COI-3	Storage classes - auto, global, static, register, extern	T1- PP. 295-303	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,End Semester Exam,Home Assignment,Lab End Semester Exam,Lab In Semester Exam,Ratings on Global Platforms,SEM- EXAM1,Skill In-Sem Exam,Skill Sem-End

Sess.No.	CO	COI	Topic	Book No[CH No][Page No]	Teaching-Learning Methods	Evaluation Components
						Exam, Skilling Continuous Evaluation
9	CO1	COI-3	Storage classes - auto, global, static, register, extern	TB PP. 295-303	Chalk,LTC,PPT,Talk	ALM, Continuous Evaluation - Lab Exercise, End Semester Exam, Home Assignment, Lab In Semester Exam, LIT, Ratings on Global Platforms, SEM-EXAM1, Skill In-Sem Exam, Skill Sem-End Exam, Skilling Continuous Evaluation
10	CO2	COI-1	summary of operators, data types & keywords, Ternary Operators	T1- PP.114-119	Chalk,LTC,PPT,Talk	ALM, Continuous Evaluation - Lab Exercise, End Semester Exam, Home Assignment, Lab In Semester Exam, Lab In Semester Exam, Ratings on Global Platforms, SEM-EXAM1, Skill In-Sem Exam, Skill Sem-End Exam, Skilling Continuous Evaluation
11	CO2	COI-1	if-else, else if ladder	T1- PP.114-132	Chalk,LTC,PPT,Talk	ALM, Continuous Evaluation - Lab Exercise, Home Assignment, Lab In Semester Exam, Lab In Semester Exam, Ratings on Global Platforms, SEM-EXAM1, Skill In-Sem Exam, Skilling Continuous Evaluation
12	CO2	COI-1	Nested if-else, switch	T1- PP.114-132	Chalk,LTC,PPT,Talk	ALM, End Semester Exam, Home Assignment, Lab In Semester Exam, SEM-EXAM1
13	CO2	COI-2	increment, decrement operators and Iterative loops	T1- PP.61-63	Chalk,LTC,PPT,Talk	ALM, End Semester Exam, Home Assignment, Lab End

Sess.No.	CO	COI	Topic	Book No[CH No][Page No]	Teaching-Learning Methods	Evaluation Components
						Semester Exam,Lab In Semester Exam,Ratings on Global Platforms,SEM-EXAM1,Skill In-Sem Exam,Skill Sem-End Exam,Skilling Continuous Evaluation
14	CO2	COI-2	Iterative statements - for, while, do-while	T1- PP.154-158	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,Lab End Semester Exam,Lab In Semester Exam,Ratings on Global Platforms,SEM-EXAM1,Skill In-Sem Exam,Skill Sem-End Exam
15	CO2	COI-2	Nested Loops	T1- PP.157-158	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,Home Assignment,Lab End Semester Exam,Lab In Semester Exam,SEM-EXAM1,Skill In-Sem Exam,Skill Sem-End Exam
16	CO2	COI-3	Bitwise Operators	T1- PP.114-119	Chalk,LTC,PPT,Talk	ALM,Home Assignment,Lab In Semester Exam,SEM-EXAM1
17	CO2	COI-3	Bit-wise operators-II	T1- PP.114-119	Chalk,LTC,PPT,Talk	ALM,Home Assignment,Lab In Semester Exam,Ratings on Global Platforms,SEM-EXAM1
18	CO2	COI-3	EXPRESSION EVALUATION RULES, Operator precedence	T1- PP.61-63	Chalk,LTC,PPT,Talk	ALM,Home Assignment,Lab End Semester Exam,Lab In Semester Exam,Ratings on Global Platforms,SEM-EXAM1,Skilling Continuous Evaluation
19	CO3	COI-	Recursion	T1- PP 288-	Chalk,LTC,PPT,Talk	ALM,Continuous

Sess.No.	CO	COI	Topic	Book No[CH No][Page No]	Teaching-Learning Methods	Evaluation Components
		2		289		Evaluation - Lab Exercise,End Semester Exam,Home Assignment,Ratings on Global Platforms,SEM-EXAM2,Skill In-Sem Exam,Skilling Continuous Evaluation
20	CO3	COI-2	Logic translation from recursive statements to iterative statements	T1- PP288-289	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,End Semester Exam,Home Assignment,Lab End Semester Exam,Lab In Semester Exam,Ratings on Global Platforms,Skill Sem-End Exam,Skilling Continuous Evaluation
21	CO3	COI-2	Logic Building using Recursion	T2-156-158	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,Home Assignment,Lab In Semester Exam,SEM-EXAM2,Skill In-Sem Exam,Skilling Continuous Evaluation
22	CO3	COI-2	Data types: char pointer, command line arguments	T1- PP.1-46	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,End Semester Exam,Home Assignment,Lab In Semester Exam,Ratings on Global Platforms,SEM-EXAM2,Skill In-Sem Exam,Skilling Continuous Evaluation
23	CO3	COI-3	Strings	T1- PP.229-241	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,End Semester Exam,Home Assignment,Ratings on Global Platforms,SEM-EXAM2,Skill In-Sem Exam,Skilling Continuous Evaluation

Sess.No.	CO	COI	Topic	Book No[CH No][Page No]	Teaching-Learning Methods	Evaluation Components
24	CO3	COI-3	String library	T1- PP.229-241	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,Home Assignment,Ratings on Global Platforms,SEM-EXAM2,Skill In-Sem Exam,Skill Sem-End Exam,Skilling Continuous Evaluation
25	CO3	COI-3	1D Arrays - creation and insertion	T1- PP.192-198, T3- PP.597-600	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,Home Assignment,Lab End Semester Exam,Ratings on Global Platforms,SEM-EXAM2,Skill In-Sem Exam,Skill Sem-End Exam,Skilling Continuous Evaluation
26	CO3	COI-4	1D Arrays - Linear Search	T1- PP.192-198, T3- PP.597-600	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,End Semester Exam,Home Assignment,Lab In Semester Exam,Ratings on Global Platforms,SEM-EXAM2,Skill In-Sem Exam,Skill Sem-End Exam,Skilling Continuous Evaluation
27	CO3	COI-4	1D Arrays - Binary search	[T1- 603-607] [Web Ref – 1]	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,Lab End Semester Exam,Lab In Semester Exam,Ratings on Global Platforms,SEM-EXAM2,Skilling Continuous Evaluation
28	CO3	COI-4	Dynamic Memory Allocation	T3- PP.197-202,216-219] [Web Ref -3	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,Home Assignment,Lab In Semester Exam,Ratings

Sess.No.	CO	COI	Topic	Book No[CH No][Page No]	Teaching-Learning Methods	Evaluation Components
						on Global Platforms,SEM-EXAM2,Skilling Continuous Evaluation
29	CO3	COI-4	2-D Arrays - creation and insertion	T1- PP.199-208	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,End Semester Exam,Home Assignment,Lab In Semester Exam,SEM-EXAM2,Skill In-Sem Exam,Skill Sem-End Exam,Skilling Continuous Evaluation
30	CO3	COI-4	Matrix Algebra	T1:258-260	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,End Semester Exam,Home Assignment,Ratings on Global Platforms,SEM-EXAM2,Skill In-Sem Exam
31	CO4	COI-2	Structures	T1- PP.317-326	Chalk,LTC,PPT,Talk	ALM,End Semester Exam,Home Assignment,Lab End Semester Exam,Lab In Semester Exam,SEM-EXAM2,Skilling Continuous Evaluation
32	CO4	COI-2	Array of Structures	T1:256-259	Chalk,LTC,PPT,Talk	ALM,End Semester Exam,Home Assignment,Lab In Semester Exam,SEM-EXAM2
33	CO4	COI-2	Structure Pointer	T1- PP.317-326	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,Home Assignment,Lab End Semester Exam,Ratings on Global Platforms,SEM-EXAM2,Skill In-Sem Exam,Skill Sem-End Exam,Skilling Continuous Evaluation

Sess.No.	CO	COI	Topic	Book No[CH No][Page No]	Teaching-Learning Methods	Evaluation Components
34	CO4	COI-3	Linear Data Structures - Stacks using arrays	T3-PP.79-82] [Web Ref – 2	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,Home Assignment,Lab End Semester Exam,Ratings on Global Platforms,SEM- EXAM2,Skill In-Sem Exam,Skill Sem-End Exam,Skilling Continuous Evaluation
35	CO4	COI-3	Linear Data Structures - Stacks using arrays	T3: 289-293	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,Lab End Semester Exam,Lab In Semester Exam,Ratings on Global Platforms,SEM- EXAM2,Skilling Continuous Evaluation
36	CO4	COI-3	Linear Data Structures - Queue using arrays	TB-3	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,End Semester Exam,Home Assignment,Lab End Semester Exam,Ratings on Global Platforms
37	CO4	COI-4	Linear Data Structures - Single Linked List - using structures	TB:3	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,End Semester Exam,Home Assignment,Lab End Semester Exam,Ratings on Global Platforms,SEM- EXAM2,Skill In-Sem Exam,Skilling Continuous Evaluation
38	CO4	COI-4	Introduction to non-linear data structures	TB:3	Chalk,LTC,PPT,Talk	ALM,Continuous Evaluation - Lab Exercise,Home Assignment,Lab In Semester Exam,Ratings on Global Platforms,SEM-

Sess.No.	CO	COI	Topic	Book No[CH No][Page No]	Teaching-Learning Methods	Evaluation Components
						EXAM2, Skilling Continuous Evaluation

Lecture Session wise Teaching – Learning Plan

SESSION NUMBER : 1

Session Outcome: 1 Understand the concept of structured Programming

Session Outcome: 2 understand the Need of Modular Programming

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explanation Structured Programming What is a Structured Programming? And its need in Programming	1	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 2

Session Outcome: 1 Design modularized solutions using algorithmic constructs to solve computational problems

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Designing Algorithms and flowcharts for problem solving	1	Chalk	Leading question

SESSION NUMBER : 3

Session Outcome: 1 Design modularized solutions using algorithmic constructs to solve computational problems

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Designing Algorithms and flowcharts for problem solving	2	Talk	One minute paper

SESSION NUMBER : 4

Session Outcome: 1 Understand Basic Data Types and to create variable of int, float data types and to read input from user

Session Outcome: 2 Understand the concept and use of array and pointers of int and float data type

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Introduction to Data Types in C. Define Integer data type, Array of Integers and Pointers to int. Define Float Data Type, array of float and Pointers to float. 1. Write a C Program to	2	Chalk	--- NOT APPLICABLE ---

	create an integer variable to store Employ ID and a float variable to store Employee salary and print those values			
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SESSION NUMBER : 5

Session Outcome: 1 Understand the concept and use of array and pointers of int and float data type.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Data types: int array, float array, char array	2	Talk	Leading question

SESSION NUMBER : 6

Session Outcome: 1 Understand the concept of reading user inputs using Console- Formatted Input

Session Outcome: 2 Develop interactive solutions for real world problems

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explanation about User Input though • Console- Formatted Input-scanf() • File- Explanation of use of files, different file operations(r,w,a+,w+), fopen(), fclose(), fscanf(), fprintf()	2	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 7

Session Outcome: 1 Develop interactive solutions using files for real world problems

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explanation about User Input though • Console- Formatted Input-scanf() • File- Explanation of use of files, different file operations(r,w,a+,w+), fopen(), fclose(), fscanf(), fprintf() 1.Using File concepts, perform a simple addition by storing the data into the file and retrieving it.	2	Talk	Leading question

SESSION NUMBER : 8

Session Outcome: 1 Think in logical way to solve real-time applications using storage classes

Session Outcome: 2 Solve computer applications using structured programming

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Storage classes - auto, global, static, register, extern	2	Talk	Leading question

SESSION NUMBER : 9

Session Outcome: 1 Think in logical way to solve real-time applications using storage classes.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Storage classes	2	Talk	Leading question

SESSION NUMBER : 10**Session Outcome:** 1 Apply operators to solve problems

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	keywords, Operators	3	Chalk	Leading question

SESSION NUMBER : 11**Session Outcome:** 1 Understand the usage of conditional statements

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Conditional Statements	2	Talk	Leading question

SESSION NUMBER : 12**Session Outcome:** 1 Develop solutions using conditional statements

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Nested if-else, switch	3	Talk	Leading question

SESSION NUMBER : 13**Session Outcome:** 1 Apply increment and decrement operators to solve problems

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Introduction to Increment and Decrement operators 1) What will be the result after executing the program? main() { int a=10; printf("%d",a++); printf("%d",++a); printf("%d",a); printf("%d",a--); printf("%d",--a); printf("%d",	3	Talk	Leading question

SESSION NUMBER : 14**Session Outcome:** 1 1. Develop iterative solutions using While loop to solve real world problems

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Introduction of iterative statements(for, while, do-while) Explanation of While loop syntax and flow chart 1. Write a program to print numbers from 1 to n using while loop. 2. Give a task to students to print first n even numbers using while loop.	3	PPT	Leading question

SESSION NUMBER : 15

Session Outcome: 1. Develop iterative solutions using While loop to solve real world problems

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Nested loops: Explain about for loop Syntax, Flow Chart, parts of for loop and working procedure with suitable Example 1. Write a program to print numbers from 1 to 20 using for loop 2. Write a program to find the factorial of a given number	3	PPT	--- NOT APPLICABLE ---

SESSION NUMBER : 16

Session Outcome: 1 Use bitwise operators

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explain Bitwise operators Bitwise AND(&) Bitwise OR() Bitwise Not(~)	3	Talk	Leading question

SESSION NUMBER : 17

Session Outcome: 2 1. Use bitwise operators

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explain Bitwise operators Bitwise XOR (^) Bitwise Left shift (<<) Bitwise Right shift (>>)	2	Talk	Leading question

SESSION NUMBER : 18

Session Outcome: 1 understand operator precedence

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Evaluate the following expression using BODMAS rule. $7 + (8\%3) - 12 * 30 / 6$. Explain operator precedence and associativity 1. find o/p of following: void main() { Int a,b=3; char c='a'; a=b+c; printf("%d\n",a); } 2. Write a C Program	3	Talk	--- NOT APPLICABLE ---

to find out Reynold Number, Prandtl No., Heat Transfer Coefficients, Catalyst Surface temperature. 3. Write a C Program for "Newton Raphson" method (To find out the root of the equation).

SESSION NUMBER : 19

Session Outcome: 1 Apply recursion for solving some mathematical related problems

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explain what a recursion is & how recursive functions work? 1. Write a C program to find nth term in Fibonacci Series using Recursion. 2. Write a program to print the sum of natural numbers using recursion	3	PPT	Leading question

SESSION NUMBER : 20

Session Outcome: 1 Traslate iterative solutions to recursive solutions

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explain what a recursion is & how recursive functions work? 1. Write a C program to find nth term in Fibonacci Series using Recursion. 2. Write a program to print the sum of natural numbers using recursion	3	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 21

Session Outcome: 1 Develop solutions using recursive logic

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	: 1.C program to find out the GCD (Greatest Common Divisor)of the two numbers using recursion Sample Input : 8 12 Sample Output : 4 2. Write a program in C to convert a decimal number to binary using recursion. Sample Input : 66 Sample Output: 1000010 3. Write a program in C to find whether the user input number is a prime number or a composite number using recursion. Sample Input :31 Sample Output: Prime number 5. Write a C program to find the first upper case letter in the given string using recursion. Sample Input : kl University	3	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 22

Session Outcome: 1 To Build problems on char data type, char array, char pointer

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods

50	Explanation of char data type, char array, char pointer Develop a function that takes character as an argument and displays the keyed-in character along with previous and next characters as per ASCII values. Explain about command line arguments	2	Talk	--- NOT APPLICABLE ---
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SESSION NUMBER : 23**Session Outcome:** 1 Understand the Strings

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explanation of String and Library functions (strlen(), strrev(), strcat(), strcpy(), strcmp()etc..) with the help of following problem Develop a program to read two strings which can perform following operations • Finding the string length • Comparing two strings • Appending second string to first string • Reverse the string • Palindrome	2	Talk	Leading question

SESSION NUMBER : 24**Session Outcome:** 1 Apply String Library functions

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explanation of String and Library functions (strlen(), strrev(), strcat(), strcpy(), strcmp()etc..) with the help of following problem Develop a program to read two strings which can perform following operations • Finding the string length • Comparing two strings • Appending second string to first string • Reverse the string • Palindrome	3	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 25**Session Outcome:** 1 Understand and implement 1D arrays

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explain need of arrays, array definition and declaration. Input/output statements and how to use it in coding	2	Talk	Leading question

SESSION NUMBER : 26**Session Outcome:** 1 Apply linear search operation on array

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explanation on Searching an element in a array by using Linear Search. Suppose you use Uber application as a ride and you request a ride to go from one place to another. Your	3	Talk	Leading question

driver just arrived at the parking lot of your place. The only thing you know about the ride is the license plate number. How do you find your Uber ride?

SESSION NUMBER : 27**Session Outcome:** 1 Apply binary search operation on array and analyse with time complexity

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explain Divide and Conquer Concept. Introduction to Binary Search, Binary Search algorithm with recursive and with Iterative and its time complexity	2	Talk	Leading question

SESSION NUMBER : 28**Session Outcome:** 1 Implementing and solving through DMA operations

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Identify error in the following statement? int a[5]; a[7]=15; Explanation of Dynamic Memory Allocation and its functions malloc(),calloc(),realloc(),free()	3	Talk	Leading question

SESSION NUMBER : 29**Session Outcome:** 1 Implement 2Dimensional Arrays and Multidimensional arrays.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explain 2D array (Multidimensional array) with syntax, memory layout and initialization in different ways with suitable examples.	2	Talk	Leading question

SESSION NUMBER : 30**Session Outcome:** 1 Implement 2Dimensional Arrays and Multidimensional arrays.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	: 1. You are given a two-dimensional 3*3 array starting from A [0][0]. You should add the alternate elements of the array and print its sum. It should print two different numbers the first being sum of A[0][0], A[0] [2], A [1] [1], A [2] [0], A [2] [2] and A [0] [1], A [1] 0], A [1] 2], A [2] [1]. 2. You are given a two-dimensional array starting from A [0][0]. You should print diagonal elements of a Matrix if a matrix is square matrix. otherwise print it is not a square Matrix. Example: It should print A [0][0], A [1] [1], A [2] [2], A [3] [3] etc if it is a square matrix.	3	Talk	Leading question

SESSION NUMBER : 31**Session Outcome:** 1 Illustrate the usage of Structures

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explanation of structures and discuss the implementation of user defined data-type 'struct'. Study the information displayed on ID card and analyzes their types of data values. Now discuss how to store the above information into a record format	2	Talk	Leading question

SESSION NUMBER : 32**Session Outcome:** 1 Solve real world problems using structure array.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explanation of array of structures (how to declare, how to initialize, how to access elements) Define a structure Bank with members Name,AccountNo,Branch,BranchCode, Balance and read 2 records and display them using structure array	3	Talk	Video synthesis

SESSION NUMBER : 33**Session Outcome:** 1 Develop solutions to real time problems using structure POINTER

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	eXPLANATION OF POINTER TO STRUCTURE	2	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 34**Session Outcome:** 1 Examine the rules to be imposed over collection to convert it into Stack data structure**Session Outcome:** 2 Analyze time complexity of stack operations

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Introduction to data structures. Types of data structures. Introduction to stack data structure and operations on stack data structure (Push, Pop, and Display Operations) with the help of example below: Consider an initially empty stack S stored in array S[0..5]. Assume the TOP be the pointer that points to topmost element on stack. TOP is initialized to -1. Show the value of TOP after each statement has been executed. Indicate any errors that might occur. Push(4);	2	Talk	--- NOT APPLICABLE ---

<pre>Push(1); Push(20); Push(-50); Push(120); Push(230); int de1 = Pop(); int de2 = Pop(); int de3 = Pop(); int de4 = Pop(); int de5 = Pop(); int de6 = Pop();</pre>			
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SESSION NUMBER : 35**Session Outcome:** 1 Implement stack using arrays

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	: Introduction to data structures. Types of data structures. Introduction to stack data structure and operations on stack data structure (Push, Pop, and Display Operations)	2	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 36**Session Outcome:** 1 Infer the rules to be imposed over collection to convert it into Queue data structure**Session Outcome:** 2 Analyze queue operations

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explanation on Queue Linear Data structure. Explain the method of inserting and deleting into Queue with the help of example below: Suppose that Q is an initially empty array-based queue of size 3. Show the values of the data members front and back after each statement has been executed. Indicate any errors that might occur. Queue Q[3]); front = _____ back = _____ Q.enqueue (30120); front = _____ back = _____ = _____ Q.enqueue (30541); front = _____ back = _____ Q.enqueue (40850); front = _____ back = _____ Q.enqueue (10020); front = _____ back = _____ int de1 = Q.dequeue(); front = _____ back = _____ Q.enqueue (31252); front = _____ back = _____ int de2 = Q.dequeue(); front = _____ back = _____ int de3 = Q.dequeue(); front = _____ back = _____ int de4 = Q.dequeue(); front = _____ back = _____ Q.enqueue (70024); front = _____ back = _____	3	Talk	Group Discussion

SESSION NUMBER : 37**Session Outcome:** 1 Implement insert operation on single linked list**Session Outcome:** 2 Analyse time complexity of insert operation

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explanation of self-referencing structure and making them understand how it is different from ordinary structure. Explanation of its types with program example. Discussing applications	2	Talk	--- NOT APPLICABLE ---

50	Single linked list-Insert Explain SLL-Insertion Operations (Insert at beginning, end and middle)	4	Talk	--- NOT APPLICABLE ---
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SESSION NUMBER : 38

Session Outcome: 1 Understand trees and tree terminology

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Explain Tree, tree terminology, Tree nomenclature, Binary tree, Properties of binary tree, Different kinds of binary Tree	2	Talk	Leading question

Tutorial Course DELIVERY Plan: NO Delivery Plan Exists

Tutorial Session wise Teaching – Learning Plan

No Session Plans Exists

Practical Course DELIVERY Plan:

Tutorial Session no	Topics	CO-Mapping
1	Algorithms, Flowcharts	CO5
2	Simple Problem Solving using varied data types with IO from Console	CO5
3	Simple Problem Solving using file I/O & Storage Classes	CO5
4	Practice session on conditional statements and logical operators	CO5
5	Iterative Statements	CO5
6	Bitwise operators	CO2
7	Problem solving using Recursion	CO5
8	Problem solving using strings	CO5

Practical Session wise Teaching – Learning Plan

SESSION NUMBER : 1

Session Outcome: 1 Design modularized solutions using algorithmic constructs to solve computational problems

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
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50	Practice session on Algorithmsession	2	LTC	--- NOT APPLICABLE ---
50	Practice session on Flowcharts	2	LTC	--- NOT APPLICABLE ---

SESSION NUMBER : 2**Session Outcome:** 1 Develop interactive solutions to real world problems

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Simple Problem Solving using varied data types with IO from Console	3	LTC	--- NOT APPLICABLE ---
50	Simple Problem Solving using varied data types with IO from Console	3	LTC	--- NOT APPLICABLE ---

SESSION NUMBER : 3**Session Outcome:** 1 Develop interactive solutions to real world problems

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Simple Problem Solving using file I/O & Storage Classes	2	LTC	--- NOT APPLICABLE ---
50	Simple Problem Solving using file I/O & Storage Classes	2	LTC	--- NOT APPLICABLE ---

SESSION NUMBER : 4**Session Outcome:** 1 Develop solutions for real-time problems using Decision making statements

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	<p>Practice session: 1. Based on ICMR guidelines the Myuria company want to test their employees based on their body temperature and cold condition. If body temperature is >99 and the person having cold to be send for COVID19 center. Or if person not effected from cold, send him to QUARANTINE center. If body temperature is <99 and the person having cold to allocate separate work place. Or if person not effected from cold, send him to regular Work place.</p> <p>2. Write a C Program to count minimum number of denominations for given amount.</p> <p>https://www.hackerrank.com/contests/justcode/challenges/minimum-number-of-coins-for-possible-sum</p> <p>3. The BOUNCE bike company</p>	3	Talk	--- NOT APPLICABLE ---

	offer bikes for rental based on the usage of time and kilometer used by the customer. The company charges rent Rs.1.25/- per Km. additionally the customer have to pay minimum charges based on time taken. https://www.hackerrank.com/challenges/c-tutorial-conditional-if-else/problem			
50	Practice session: 1. Based on ICMR guidelines the Myuria company want to test their employees based on their body temperature and cold condition. If body temperature is >99 and the person having cold to be send for COVID19 center. Or if person not effected from cold, send him to QUARANTINE center. If body temperature is <99 and the person having cold to allocate separate work place. Or if person not effected from cold, send him to regular Work place. 2. Write a C Program to count minimum number of denominations for given amount. https://www.hackerrank.com/contests/justcode/challenges/minimum-number-of-coins-for-possible-sum 3. The BOUNCE bike company offer bikes for rental based on the usage of time and kilometer used by the customer. The company charges rent Rs.1.25/- per Km. additionally the customer have to pay minimum charges based on time taken. https://www.hackerrank.com/challenges/c-tutorial-conditional-if-else/problem	3	Talk	--- NOT APPLICABLE ---

SESSION NUMBER : 5

Session Outcome: 1 1. Develop iterative solutions using for loop to solve real world problems.

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Practice session on Iterative statements	3	LTC	--- NOT APPLICABLE ---
50	Practice session on Nested loops	3	LTC	--- NOT APPLICABLE ---

SESSION NUMBER : 6

Session Outcome: 1 Develop applications using bitwise operators

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	Ask the students to practice the following problems 1. Void main() { int a=12,b=25; printf("a&b=%d",a&b); printf("a b=%d",a b); printf("~a=%d",~a); printf("~b=%d",~b); } 2. Write a C Program to simulate AND, OR and NOT logic gates by allowing the user input binary values for A and B	3	LTC	--- NOT APPLICABLE ---
50	1. Swap two values by using XOR operators. 2. Ask student to solve the following problem: Void main() { int a=212,b,c; b=a<<2; c=a>>3; printf("b=%d,c=%d",b,c); } 3. Ask the	3	LTC	--- NOT APPLICABLE ---

	student how to double and half the values by using bitwise left shift and right shift operators			
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SESSION NUMBER : 7**Session Outcome: 1** Develop recursive solutions

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	: 1. Ask the student to write the implementation of finding factorial of number using recursion as well as iteration 2. Write a 3 LTC Leading question 6/9/2021 25/81 C program to count digits of a number using Recursion and Iteration. 3. Write a C program to find sum of all digits using Recursion and Iteration. 4. Ask the student to Calculate power of a number program using Recursion and Iteration 5. Ask the student to write C program to calculate length of the string using Recursion and Iteration	3	LTC	--- NOT APPLICABLE ---
50	: 1. Ask the student to write the implementation of finding factorial of number using recursion as well as iteration 2. Write a 3 LTC Leading question 6/9/2021 25/81 C program to count digits of a number using Recursion and Iteration. 3. Write a C program to find sum of all digits using Recursion and Iteration. 4. Ask the student to Calculate power of a number program using Recursion and Iteration 5. Ask the student to write C program to calculate length of the string using Recursion and Iteration	3	LTC	--- NOT APPLICABLE ---

SESSION NUMBER : 8**Session Outcome: 1** Apply string library functions

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	. Develop a program which initializes character array with set of n characters and display the sum of all characters as per their ASCII values. 2. Develop a program which initializes character array with set of characters and create a character pointer and display the second and third character of character array using character pointer. 3. Write a C program which read 3 numbers through command line arguments and print the sum of three numbers.	2	LTC	--- NOT APPLICABLE ---
50	1)Write a program to read a string and find out a word is present in that string and also print starting index of the word using strstr(). Input: Str1=" Was this the face that launch'd a thousand ships"; Str2="face"; Output: String 'face' was found at position 14 in string 'Was this the face that launch'd a thousand ships'. 2)Write a program to declare to three strings and take input into two strings and concatenate two strings into the third string in one line of code Input: Str1:The face of the ship Str2:is too wide Str3:Empty(It should contain the concatenated string) Output: Str3 should print "The face of	3	LTC	--- NOT APPLICABLE ---

the ship is too wide" 3) Write a program to compare two different strings upto nth character(Hint: strcmp(str1, str2,BUFFERSIXE)

Skilling Course DELIVERY Plan:

Skilling session no	Topics/Experiments	CO-Mapping
1	Basic problems	CO6
2	Data Types operators	CO6
3	Skill-3	CO6
4	skill-4	CO6
5	skill-5	CO6

Skilling Session wise Teaching – Learning Plan

SESSION NUMBER : 1

Session Outcome: 1 Develop solutions for simple problems

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	1. Write a C program to print "Hello World" 2. Write a C program to read and print an Integer value, Float value, Char value from keyboard	6	LTC	--- NOT APPLICABLE ---
50	3. Write a C program to perform Addition, Subtraction, multiplication and division of two numbers. 4. Write a C program to swap two variables without a temporary variable.	6	LTC	--- NOT APPLICABLE ---

SESSION NUMBER : 2

Session Outcome: 1 Understand Basic Data Types and to create variable of int, float data types and to read input from user

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
50	5. Write C functions to calculate area of circle, square. 6. Write a C function to convert Celsius to Fahrenheit. (HINT: $(0^{\circ}\text{C} \times 9/5) + 32 = 32^{\circ}\text{F}$).	6	LTC	--- NOT APPLICABLE ---
50	7. Write a C function to find $x^2+4x+12$ Equation for given x value. 8. Write a C function to calculate Simple Interest given principal, time and rate as arguments.	6	LTC	--- NOT APPLICABLE ---

SESSION NUMBER : 3**Session Outcome:** 1 Develop code for real world problems

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
60	Cutting Paper Squares https://www.hackerrank.com/challenges/p1-paper-cutting/problem Maximum Draws https://www.hackerrank.com/challenges/maximum-draws/problem Handshake https://www.hackerrank.com/challenges/handshake/problem	6	LTC	--- NOT APPLICABLE ---

SESSION NUMBER : 4**Session Outcome:** 1 Develop programs to solve different kinds of computational problems

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
60	Summing the N series https://www.hackerrank.com/challenges/summing-the-n-series/problem Minimum Height Triangle https://www.hackerrank.com/challenges/lowest-triangle/problem "Connecting Towns " https://www.hackerrank.com/challenges/connecting-towns/problem	6	LTC	--- NOT APPLICABLE ---

SESSION NUMBER : 5**Session Outcome:** 1 Develop solutions for real-time problems using Decision making statements

Time(min)	Topic	BTL	Teaching-Learning Methods	Active Learning Methods
60	Filling jars https://www.hackerrank.com/challenges/filling-jars/problem Find the Point https://www.hackerrank.com/challenges/find-point/problem Army game https://www.hackerrank.com/challenges/game-with-cells/problem Best Divisors https://www.hackerrank.com/challenges/best-divisor/problem Restaurent https://www.hackerrank.com/challenges/restaurant/problem Points on a Line https://www.hackerrank.com/challenges/points-on-a-line/problem	6	LTC	--- NOT APPLICABLE ---

WEEKLY HOMEWORK ASSIGNMENTS/ PROBLEM SETS/OPEN ENDED PROBLEM-SOLVING EXERCISES etc:

Week	Assignment Type	Assignment No	Topic	Details	co

COURSE TIME TABLE:

	Hour	1	2	3	4	5	6	7	8	9
Day	Component									
Mon	Theory	V-S4,V-S11,V-S12,V-S20,V-S26,V-S27,V-S32	V-S4,V-S11,V-S12,V-S20,V-S26,V-S27,V-S32	V-S8,V-S13,V-S16,V-S17,V-S19,V-S21	V-S13,V-S16,V-S17,V-S21	V-S2,V-S6,V-S14,V-S18,V-S29,V-S38	V-S2,V-S6,V-S14,V-S29	--	V-S35,V-S36,V-S38	--
	Tutorial	--	--	--	--	--	--	--	--	--
	Lab	V-S13	V-S13	V-S1,V-S27	V-S1,V-S27	V-S7,V-S19,V-S25	V-S7,V-S19,V-S25	V-S33	V-S33	V-S38
	Skilling	V-S3,V-S5,V-S24,V-S25,V-S28,V-S34,V-S37	V-S3,V-S5,V-S24,V-S25,V-S28,V-S34,V-S37	V-S9,V-S10,V-S22,V-S33	V-S9,V-S10,V-S22,V-S33	V-S15,V-S40	V-S15,V-S40	--	--	--
Tue	Theory	V-S10,V-S19,V-S22,V-S24,V-S32	V-S9,V-S10,V-S19,V-S22,V-S24	V-S18,V-S40	V-S18,V-S40	V-S17	--	---	V-S35,V-S38	--
	Tutorial	--	--	--	--	--	--	---	--	--
	Lab	V-S14	V-S14	V-S2,V-S32	V-S2,V-S32	V-S8,V-S20,V-S30	V-S8,V-S20,V-S30	---	---	V-S35,V-S36,V-S40
	Skilling	V-S21,V-S26,V-S29,V-S30,V-S37	V-S21,V-S26,V-S29,V-S30,V-S37	V-S7,V-S11,V-S12,V-S14,V-S15,V-S33	V-S7,V-S11,V-S12,V-S14,V-S15,V-S33	V-S1,V-S4,V-S5,V-S6,V-S16,V-S28,V-S36,V-S39	V-S1,V-S4,V-S5,V-S6,V-S16,V-S28,V-S36,V-S39	---	---	--
Wed	Theory	V-S1,V-S15,V-S20,V-S28,V-S34,V-S37	V-S28,V-S34,V-S37	V-S5,V-S30	V-S5	V-S7	V-S7	--	--	---
	Tutorial	--	--	--	--	--	--	--	--	---
	Lab	V-S9,V-S17	V-S9,V-S17	V-S15,V-S21	V-S15,V-S21	V-S3	V-S3	V-S34	V-S34	---
	Skilling	V-S2,V-S3,V-S13,V-S18,V-S19,V-S21	V-S2,V-S3,V-S13,V-S18,V-S19,V-S21	V-S4,V-S6,V-S27,V-S29,V-S33	V-S4,V-S6,V-S27,V-S29,V-S33	V-S8,V-S10,V-S12,V-S14,V-S16,V-S23,V-S24,V-S26	V-S8,V-S10,V-S12,V-S14,V-S16,V-S23,V-S24,V-S26	--	--	---

		S22,V-S31,V-S32	S22,V-S31,V-S32		S25,V-S26,V-S35,V-S36,V-S38,V-S39	S25,V-S26,V-S35,V-S38,V-S39				
Thu	Theory	V-S16,V-S23	V-S23	V-S1,V-S2,V-S3,V-S7,V-S11,V-S31	V-S1,V-S2,V-S3,V-S7,V-S11,V-S31	--	V-S10,V-S29	--	V-S36	--
	Tutorial	--	--	--	--	--	--	--	--	--
	Lab	V-S10,V-S26	V-S10,V-S26	V-S16,V-S22,V-S37	V-S16,V-S22,V-S37	V-S4	V-S4	V-S31	V-S31	V-S39
	Skilling	V-S6,V-S13,V-S17,V-S19,V-S20,V-S21,V-S22,V-S28,V-S30,V-S32,V-S37	V-S6,V-S13,V-S17,V-S19,V-S20,V-S21,V-S22,V-S28,V-S30,V-S32,V-S37	V-S5,V-S9,V-S27,V-S29,V-S34	V-S5,V-S9,V-S27,V-S29,V-S34	V-S8,V-S15,V-S24,V-S27,V-S29,V-S34	V-S8,V-S15,V-S24,V-S27,V-S29,V-S34	--	--	--
Fri	Theory	V-S8,V-S33,V-S37	V-S8,V-S14,V-S31,V-S33,V-S34	V-S15	V-S6,V-S22,V-S23	V-S30	V-S30	---	V-S39	---
	Tutorial	--	--	--	--	--	--	---	--	---
	Lab	V-S5,V-S23	V-S5,V-S23	V-S11	V-S11	--	--	---	--	---
	Skilling	V-S1,V-S7,V-S9,V-S11,V-S12,V-S13,V-S18,V-S25,V-S26,V-S32	V-S1,V-S7,V-S9,V-S11,V-S12,V-S13,V-S18,V-S25,V-S26,V-S32	V-S2,V-S4,V-S16,V-S17,V-S20,V-S27,V-S31	V-S2,V-S4,V-S16,V-S17,V-S20,V-S27,V-S31	V-S35,V-S36,V-S38,V-S40	V-S35,V-S38,V-S40	---	--	---
Sat	Theory	V-S12,V-S15,V-S28	V-S13	V-S5,V-S25,V-S26,V-S27,V-S33,V-S40	V-S25	V-S4,V-S9,V-S21,V-S39	V-S3,V-S9,V-S19,V-S21,V-S24,V-S39	---	V-S35,V-S36	---
	Tutorial	--	--	--	--	--	--	---	--	---
	Lab	V-S6,V-S24	V-S6,V-S24	V-S12,V-S28	V-S12,V-S28	V-S18,V-S29	V-S18,V-S29	---	--	---
	Skilling	V-S7,V-S8,V-S11,V-	V-S7,V-S8,V-S11,V-	V-S1,V-S2,V-S3,V-S17,V-	V-S1,V-S2,V-S3,V-S17,V-	V-S10,V-S23,V-S36	V-S10,V-S23,V-S36	---	--	---

		S14,V-S18,V-S30	S14,V-S18,V-S30	S19,V-S20,V-S34	S19,V-S20,V-S34					
Sun	Theory	--	--	--	--	--	--	--	--	--
	Tutorial	--	--	--	--	--	--	--	--	--
	Lab	--	--	--	--	--	--	--	--	--
	Skilling	--	--	--	--	--	--	--	--	--

REMEDIAL CLASSES:

Supplement course handout, which may perhaps include special lectures and discussions that would be planned, and schedule notified according

SELF-LEARNING:

Assignments to promote self-learning, survey of contents from multiple sources.

S.no	Topics	CO	ALM	References/MOOCS
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DELIVERY DETAILS OF CONTENT BEYOND SYLLABUS:

Content beyond syllabus covered (if any) should be delivered to all students that would be planned, and schedule notified accordingly.

S.no	Advanced Topics, Additional Reading, Research papers and any	CO	ALM	References/MOOCS
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EVALUATION PLAN:

Evaluation Type	Evaluation Component	Weightage/Marks		Assessment Dates	Duration (Hours)	CO1	CO2	CO3	CO4	CO5	CO6
End Semester Summative Evaluation Total= 40 %	Skill Sem-End Exam	Weightage	6		110						6
		Max Marks	50								50
	End Semester Exam	Weightage	24		180	6	6	6	6		
		Max Marks	100			25	25	25	25		
	Lab End Semester Exam	Weightage	10		110					10	
		Max Marks	50							50	
In Semester Formative Evaluation Total= 24 %	Ratings on Global Platforms	Weightage	4		20	1	1	1	1		
		Max Marks	50			12.5	12.5	12.5	12.5		
	Skilling Continuous Evaluation	Weightage	4		110						4
		Max Marks	50								50
	ALM	Weightage	5		20	2	1	1	1		
		Max Marks	50			12.5	12.5	12.5	12.5		
	Home Assignment	Weightage	5		20	2	1	1	1		

	and Textbook	Max Marks	50			12.5	12.5	12.5	12.5		
In Semester Summative Evaluation Total= 36 %	Continuous Evaluation - Lab Exercise	Weightage	6		110					6	
		Max Marks	50							50	
In Semester Summative Evaluation Total= 36 %	Semester in Exam-I	Weightage	12		120	6	6				
		Max Marks	50			25	25				
	Semester in Exam-II	Weightage	12		120			6	6		
		Max Marks	50					25	25		
	Lab In Semester Exam	Weightage	8		110					8	
		Max Marks	50							50	
	Skill In-Sem Exam	Weightage	4		110						4
		Max Marks	50								50

ATTENDANCE POLICY:

Every student is expected to be responsible for regularity of his/her attendance in class rooms and laboratories, to appear in scheduled tests and examinations and fulfill all other tasks assigned to him/her in every course. In every course, student has to maintain a minimum of 85% attendance to be eligible for appearing in Semester end examination of the course, for cases of medical issues and other unavoidable circumstances the students will be condoned if their attendance is between 75% to 85% in every course, subjected to submission of medical certificates, medical case file and other needful documental proof to the concerned departments.

DETENTION POLICY :

In any course, a student has to maintain a minimum of 85% attendance and In-Semester Examinations to be eligible for appearing to the Semester End Examination, failing to fulfill these conditions will deem such student to have been detained in that course.

PLAGIARISM POLICY :

Supplement course handout, which may perhaps include special lectures and discussions

COURSE TEAM MEMBERS, CHAMBER CONSULTATION HOURS AND CHAMBER VENUE DETAILS:

Supplement course handout, which may perhaps include special lectures and discussions

Name of Faculty	Delivery Component of Faculty	Sections of Faculty	Chamber Consultation Day (s)	Chamber Consultation Timings for each day	Chamber Consultation Room No:	Signature of Course faculty:
Shaik Razia	L	3-MA,14-MA	-	-	-	-
Shaik Razia	P	3-MA,14-MA	-	-	-	-
Shaik Razia	S	3-MA,14-MA	-	-	-	-
Haritha Donavalli	L	1-MA	-	-	-	-
Sridevi Emandi	L	12-MA,22-MA	-	-	-	-

Sridevi Emandi	P	12- MA,22- MA	-	-	-	-
Sridevi Emandi	S	12- MA,22- MA	-	-	-	-
Pavan Kumar Nidumolu	L	13-MA	-	-	-	-
Pavan Kumar Nidumolu	P	13-MA	-	-	-	-
Pavan Kumar Nidumolu	S	13-MA	-	-	-	-
Venkata Naga Ramesh Janjhyam	L	36-MA	-	-	-	-
Venkata Naga Ramesh Janjhyam	P	36-MA	-	-	-	-
Venkata Naga Ramesh Janjhyam	S	36-MA	-	-	-	-
JAYABHASKAR MUTHUKURU	S	14-MA	-	-	-	-
Zeelan CMAK	L	17- MA,24- MA	-	-	-	-
Zeelan CMAK	P	17- MA,24- MA	-	-	-	-
Zeelan CMAK	S	17- MA,24- MA	-	-	-	-
Vasantham Kumar	L	39-MA	-	-	-	-
Vasantham Kumar	P	39-MA	-	-	-	-
Vasantham Kumar	S	39-MA	-	-	-	-
Shaik Gouse	L	38-MA	-	-	-	-
Shaik Gouse	P	38-MA	-	-	-	-
Shaik Gouse	S	38-MA	-	-	-	-
Uday kumar VAMPUGANI	L	16- MA,18- MA	-	-	-	-
Uday kumar VAMPUGANI	P	16- MA,18- MA	-	-	-	-
Uday kumar VAMPUGANI	S	16- MA,18- MA	-	-	-	-
Dama Anand	L	4-MA,19- MA	-	-	-	-
Dama Anand	P	4-MA,19- MA	-	-	-	-

Dama Anand	S	4-MA,19-MA	-	-	-	-
Siva Kumar Pathuri	L	15-MA,23-MA	-	-	-	-
Siva Kumar Pathuri	P	15-MA,23-MA	-	-	-	-
Siva Kumar Pathuri	S	15-MA,23-MA	-	-	-	-
Velagapalli Premalatha	L	7-MA,20-MA	-	-	-	-
Velagapalli Premalatha	P	7-MA,20-MA	-	-	-	-
Velagapalli Premalatha	S	7-MA,20-MA	-	-	-	-
AZMIRA KRISHNA	L	5-MA,10-MA	-	-	-	-
AZMIRA KRISHNA	P	5-MA,10-MA	-	-	-	-
AZMIRA KRISHNA	S	5-MA,10-MA	-	-	-	-
Sreeram Nimmagadda	L	2-MA,8-MA	-	-	-	-
Sreeram Nimmagadda	P	2-MA,8-MA	-	-	-	-
Sreeram Nimmagadda	S	2-MA,8-MA	-	-	-	-
E Rajesh Kumar	L	11-MA,21-MA	-	-	-	-
E Rajesh Kumar	P	11-MA,21-MA	-	-	-	-
E Rajesh Kumar	S	11-MA,21-MA	-	-	-	-
T Ganesan	L	26-MA	-	-	-	-
T Ganesan	P	26-MA	-	-	-	-
T Ganesan	S	26-MA	-	-	-	-
U Harita	L	28-MA	-	-	-	-
U Harita	P	28-MA	-	-	-	-
U Harita	S	28-MA	-	-	-	-
Ashok Bekkanti	L	31-MA,40-MA	-	-	-	-

Ashok Bekkanti	P	31- MA,40- MA	-	-	-	-
Ashok Bekkanti	S	31-MA	-	-	-	-
SHILPA ITNAL	L	27-MA	-	-	-	-
SHILPA ITNAL	P	27-MA	-	-	-	-
SHILPA ITNAL	S	27-MA	-	-	-	-
YALANATI AYYAPPA	L	6-MA,9- MA	-	-	-	-
YALANATI AYYAPPA	P	6-MA,9- MA	-	-	-	-
YALANATI AYYAPPA	S	6-MA,9- MA	-	-	-	-
Parasa Gayatri	L	35-MA	-	-	-	-
Parasa Gayatri	P	1-MA,35- MA	-	-	-	-
Parasa Gayatri	S	1-MA,35- MA	-	-	-	-
ARUMBAKA RAO	L	34-MA	-	-	-	-
ARUMBAKA RAO	P	34-MA	-	-	-	-
ARUMBAKA RAO	S	34-MA	-	-	-	-
SONTI HARIKA	L	33-MA	-	-	-	-
SONTI HARIKA	P	33-MA	-	-	-	-
SONTI HARIKA	S	33-MA	-	-	-	-
NAVEEN KUMAR	L	25- MA,30- MA	-	-	-	-
NAVEEN KUMAR	P	25- MA,30- MA	-	-	-	-
NAVEEN KUMAR	S	25- MA,30- MA	-	-	-	-
NAGARAJ J	L	29-MA	-	-	-	-
NAGARAJ J	P	29-MA	-	-	-	-
NAGARAJ J	S	29-MA	-	-	-	-
Yamini Tondepu	L	32-MA	-	-	-	-
Yamini Tondepu	P	32-MA	-	-	-	-
Yamini Tondepu	S	32- MA,40- MA	-	-	-	-
RAMESH MAILAPALLI	S	40-MA	-	-	-	-

Aravindan Srinivasan	L	37-MA	-	-	-	-
Aravindan Srinivasan	P	37-MA	-	-	-	-
Aravindan Srinivasan	S	37-MA	-	-	-	-

GENERAL INSTRUCTIONS

Students should come prepared for classes and carry the text book(s) or material(s) as prescribed by the Course Faculty to the class.

NOTICES

Most of the notices are available on the LMS platform.

All notices will be communicated through the institution email.

All notices concerning the course will be displayed on the respective Notice Boards.

Signature of COURSE COORDINATOR

(Sreeram Nimmagadda)

Signature of Department Prof. Incharge Academics & Vetting Team Member

Department Of DBES-1

HEAD OF DEPARTMENT:**Approval from: DEAN-ACADEMICS**

(Sign with Office Seal) [object HTMLDivElement]