Ref No:

SRI KRISHNA INSTITUTE OF TECHNOLOGY, BENGALURU

COURSE PLAN

Academic Year 2019-20

Program:	B E – Basic Science
Semester:	1
Course Code:	18CPS13
Course Title:	C Programming for Problem Solving
Credit / L-T-P:	3 / 2-2-0
Total Contact Hours:	40
Course Plan Author:	MANJULA K

Academic Evaluation and Monitoring Cell

No. 29, Chimney hills, Hesaraghatta Road, Chikkabanavara
BANGALORE-560090, KARNATAKA , INDIA
Phone / Fax :+91-08023721315/23721477, Web: www.skit.org.in

Table of Contents

Note : Remove "Table of Content" before including in CP Book
Each Course Plan shall be printed and made into a book with cover page
Blooms Level in all sections match with A.2, only if you plan to teach / learn at higher levels

A. COURSE INFORMATION

1. Course Overview

Degree:	B E	Program:	BS
Semester:	1	Academic Year:	2019-2020
Course Title:	C programming for problem solving	Course Code:	18CPS13
Credit / L-T-P:	3/2-2-0	SEE Duration:	180 Minutes
Total Contact Hours:	40	SEE Marks:	60
CIA Marks:	40	Assignment	3
Course Plan Author:	Manjula K	Sign ..	Dt:
Checked By:		Sign ..	Dt:
CO Targets	CIA Target:75%	SEE Target:	65%

Note: Define CIA and SEE % targets based on previous performance.

2. Course Content

Content / Syllabus of the course as prescribed by University or designed by institute. Identify 2 concepts per module as in G.

Module	Content	Teaching Hours	Identified Module Concepts	Blooms Learning Levels
1	Introduction to computer Hardware and software: Computer generations, computer types, bits, bytes and words, CPU, Primary memory, Secondary memory, ports and connections, input devices, output devices, Computers in a network, Network hardware, Software basics, software types.	3	Computer Architecture	L2 Understand
	Overview of C: Basic structure of C program, executing a C program-Compilation and linking processes, Constant such as Integer, Real, Floating point, character, string constants, variable declaration and Initialization data types-Void, Integer, Floating Point, Character, Logical data Operators and expressions.	5	Program structure	L2 Understand
2	Managing Input and output operations-Introduction, Reading a character, writing a character, Formatted input and Formatted output, sample program.	3	Standard Input & Output library	L2 Understand
	Decision Making-Introduction, Decision making with IF statements, SWITCH statements, Break statements, Continue statements and GOTO statements. Branching and Looping- Introduction, WHILE statements, Do-While, Switch statements, If-Then-else and its sample programs Finding roots of a quadratic equation, computation of binomial coefficients, plotting of Pascals triangle.	5	Program constructs	L2 Understand
3	Arrays: Arrays (1-Dimensional, 2-Dimensional),Declaration, Characteristics, Initialization, Character arrays and Strings	4	Structured data representation	L3 Apply
	Basic Algorithms: Searching and Sorting Algorithms (Linear search, Binary search, Bubble sort and Selection sort).	4	data arrangement & probing	L3 Apply
4	User Defined Functions-Introduction, Elements of function, Types of functions, Function Prototype.	5	Modular programming	L2 Understand
	Recursion-Definition, Example programs, Finding Factorial of a positive integers and Fibonacci series.	3	Recursion	L3 Apply
5	Structure-Definition, declaration of structures, Initialization, structure within structure, array of structures, pointer to structures.	4	User-defined datatype	L3 Apply
	Pointers-Definition, declaration of pointers, Initialization of pointers, Accessing a variable, Array of pointers, pointers and structures, void pointers, sample programs Preprocessor Directives- macro substitution, inclusion.	4	Memory representation	L3 Apply

-	**Total**	**40**	-	-

3. Course Material

Books & other material as recommended by university (A, B) and additional resources used by course teacher (C).

1. Understanding: Concept simulation / video; one per concept; to understand the concepts; 15 – 30 minutes
2. Design: Simulation and design tools used – software tools used; Free / open source
3. Research: Recent developments on the concepts – publications in journals; conferences etc.

Modules	Details	Chapters in book	Availability
A	**Text books (Title, Authors, Edition, Publisher, Year.)**	**-**	**-**
1,2,3,4,5	Programming in ANSI C, E. Balaguruswamy, 7th Edition, Tata McGraw-Hill.	1,2,3,4,5,6,7,8, 9,10,11	In Library
	The C Programming Language ,Brian W. Kernighan and Dennis M. Ritchie, Prentice Hall of India.	-	In Library
B	**Reference books (Title, Authors, Edition, Publisher, Year.)**	**-**	**-**
1	Sumitabha Das, Computer Fundamentals & C Programming, Mc Graw Hill Education.	1,2	In Library
	Gary J Bronson, ANSI C Programming, 4 th Edition, Ceneage Learning		-
	Vikas Gupta: Computer Concepts and C Programming, Dreamtech Press 2013.		-
	R S Bichkar, Programming with C, University Press, 2012		-
	V Rajaraman: Computer Programming in C, PHI, 2013.		-
	Basavaraj S. Anami, Shanmukhappa A Angadi, Sunilkumar S. Manvi, Computer Concepts and C Programming: A Holistic Approach to Learning C, Second edition, PHI India, 2010.		-
C	**Concept Videos or Simulation for Understanding**	**-**	**-**
C1	*https://www.youtube.com/watch?v=OeZm1jHQMgs https://www.sutori.com/story/five-generations-of-computers-and-history-of-the-internet--pbsgKHnCZTQQ37Bta9VfVwmi https://www.ukessays.com/essays/computer-science/comparison-of-different-types-of-computer-memory-computer-science-essay.php*		
C2	*https://www.youtube.com/watch?v=aj_X9UwHXac https://www.youtube.com/watch?v=eytkPcvxb7o*		
C3	*https://www.youtube.com/watch?v=kT9vxEtV130*		
C4	https://www.youtube.com/watch?v=xB3OnNnhDrU		
C5	https://www.youtube.com/watch?v=LEgitOGtgkM		
C6	https://www.youtube.com/watch?v=u93_v49rEx0		
C7	https://www.youtube.com/watch?v=w4kfTsQFDr4		
C8	https://www.youtube.com/watch?v=j1-68rf0wsg		
C9	https://www.youtube.com/watch?v=Ranc3Vvjl88		
C10	https://www.edureka.co/blog/pointers-in-c/		
D	**Software Tools for Design**	**-**	**-**
E	**Recent Developments for Research**	**-**	**-**
F	**Others (Web, Video, Simulation, Notes etc.)**	**-**	**-**
1	*https://www.tutorialspoint.com/c_language_online_training/index.asp*		
2	*https://www.guru99.com/c-programming-tutorial.html*		

4. Course Prerequisites

Refer to GL01. If prerequisites are not taught earlier, GAP in curriculum needs to be addressed. Include in Remarks and implement in B.5.
Students must have learnt the following Courses / Topics with described Content ...

Modules	Course Code	Course Name	Topic / Description	Sem	Remarks	Blooms Level

5. Content for Placement, Profession, HE and GATE

The content is not included in this course, but required to meet industry & profession requirements and help students for Placement, GATE, Higher Education, Entrepreneurship, etc. Identifying Area / Content requires experts consultation in the area.
Topics included are like, a. Advanced Topics, b. Recent Developments, c. Certificate Courses, d. Course Projects, e. New Software Tools, f. GATE Topics, g. NPTEL Videos, h. Swayam videos etc.

Modules	Topic / Description	Area	Remarks	Blooms Level

B. OBE PARAMETERS

1. Course Outcomes

Expected learning outcomes of the course, which will be mapped to POs. Identify a max of 2 Concepts per Module. Write 1 CO per Concept.

Modules	Course Code.#	Course Outcome **At the end of the course, student should be able to . . .**	Teach. Hours	Concept	Instr Method	Assessment Method	Blooms' Level
1	18CPS13.1	Understand the working of Computer System.	3	Computer Architecture	Lecture	Question& Answer Assignment	L2 Understand
1	18CPS13.2	Understand the procedure to write a C program and usage of Variables & Operators	5	Program structure	Lecture	Question & Answer Assignment	L2 Understand
2	18CPS13.3	Understand to read and write the data using Input & Output library functions	3	Standard Input & Output library Question & Answer Assignment	Lecture	Question & Answer Assignment	L2 Understand
2	18CPS13.4	Understand to construct a programming solution to a given problem using Branching & Looping constructs	5	Program constructs	Lecture	Question & Answer Assignment	L2 Understand
3	18CPS13.5	Understand the linear representation of data using arrays	4	Structured data representation	Lecture	Question & Answer Assignment	L2 Understand
3	18CPS13.6	Develop Algorithms for data	4	data	Lecture	Question &	L3

		arrangement & probing using Searching & Sorting technique		arrangement & probing		Answer Assignment	Apply
4	18CPS13.7	Understand Modular representation of program using User-Defined functions	5	Modular programming	Lecture	Question & Answer Assignment	L2 Understand
4	18CPS13.8	Develop a C program using Recursion	3	Recursion	Lecture	Question & Answer Assignment	L3 Apply
5	18CPS13.9	Develop a C program to store the data of different types using structures	4	User-defined datatype	Lecture	Question & Answer Assignment	L3 Apply
5	18CPS13.10	Develop a C program to store the address of a variable using Pointers	4	Memory representation	Lecture	Question & Answer Assignment	L3 Apply
-	-	**Total**	**40**	-	-	-	**L2-L3**

2. Course Applications

Write 1 or 2 applications per CO.
Students should be able to employ / apply the course learnings to . . .

Modules	Application Area Compiled from Module Applications.	CO	Level
1	Web applications, development tools, image editing programs, and communication programs	CO1	L2
2	To create computer applications, embedded softwares	CO2	L2
3	Computer-aided design, graphical user interfaces, image processing	CO3	L2
4	Banking sectors, Theory of Algebra, In Number theory, DNA sequences	CO4	L2
5	Computer Graphics, Database Management system	CO5	L2
6	Banking sectors	CO6	L3
7	Database Management system	CO7	L2
8	Combinatorial problems, Dynamic programming	CO8	L3
9	Computer Architecture	CO9	L3
10	System programming	CO10	L3

3. Mapping And Justification

CO – PO Mapping with mapping Level along with justification for each CO-PO pair.
To attain competency required (as defined in POs) in a specified area and the knowledge & ability required to accomplish it.

Modules	Mapping		Mapping Level	Justification for each CO-PO pair	Level
-	**CO**	**PO**	-	**'Area': 'Competency' and 'Knowledge' for specified 'Accomplishment'**	-
1	CO1	PO1	L2	Knowledge of Basic parts of Computer, and its working is discussed.	L2
1	CO1	PO2	-	No Analyzing. No mapping	L2
1	CO1	PO3	-	No design &development content, No mapping, Attainment will be Zero, if mapping done.	L2
1	CO1	PO4	-	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	L2
1	CO1	PO5	-	No tool content. No mapping	L2
1	CO1	PO6	-	No social, cultural issues. No mapping	L2
1	CO1	PO7	-	No impact on Environment and sustainability. No mapping	L2
1	CO1	PO8	-	No team work or lead for the ethical work. No mapping	L2
1	CO1	PO9	-	No team work or lead for the ethical work. No mapping	L2
1	CO1	PO10	-	No usage for communication. No mapping.	L2
1	CO1	PO11	-	No project management and finance. No mapping.	L2
1	CO1	PO12	-	No mapping as there is only understanding	L2

1	CO2	PO1	L2	Basic Structure of C program and its Concepts are discussed.	L2
1	CO2	PO2	-	No Analyzing. No mapping	L2
1	CO2	PO3	-	No design &development content, No mapping, Attainment will be Zero, if mapping done.	L2
1	CO2	PO4	-	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	L2
1	CO2	PO5	-	No tool content. No mapping	L2
1	CO2	PO6	-	No social, cultural issues. No mapping	L2
1	CO2	PO7	-	No impact on Environment and sustainability. No mapping	L2
1	CO2	PO8	-	No team work or lead for the ethical work. No mapping	L2
1	CO2	PO9	-	No team work or lead for the ethical work. No mapping	L2
1	CO2	PO10	-	No usage for communication. No mapping.	L2
1	CO2	PO11	-	No project management and finance. No mapping.	L2
1	CO2	PO12	-	No mapping as there is only understanding	L2
2	CO3	PO1	L2	Understanding the procedures to read and write I/O functions	L2
2	CO3	PO2	-	No Analyzing. No mapping	L2
2	CO3	PO3	-	No design &development content, No mapping, Attainment will be Zero, if mapping done.	L2
2	CO3	PO4	-	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	L2
2	CO3	PO5	-	No tool content. No mapping	L2
2	CO3	PO6	-	No social, cultural issues. No mapping	L2
2	CO3	PO7	-	No impact on Environment and sustainability. No mapping	L2
2	CO3	PO8	-	No team work or lead for the ethical work. No mapping	L2
2	CO3	PO9	-	No team work or lead for the ethical work. No mapping	L2
2	CO3	PO10	-	No usage for communication. No mapping.	L2
2	CO3	PO11	-	No project management and finance. No mapping.	L2
2	CO3	PO12	-	No mapping as there is only understanding	L2
2	CO4	PO1	L2	Understanding the Concepts of C Language	L2
2	CO4	PO2	L3	Analyze the problem to use relevant Branching and looping Constructs	L2
2	CO4	PO3	-	No design &development content, No mapping, Attainment will be Zero, if mapping done.	L2
2	CO4	PO4	-	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	L2
2	CO4	PO5	-	No tool content. No mapping	L2
2	CO4	PO6	-	No social, cultural issues. No mapping	L2
2	CO4	PO7	-	No impact on Environment and sustainability. No mapping	L2
2	CO4	PO8	-	No team work or lead for the ethical work. No mapping	L2
2	CO4	PO9	-	No team work or lead for the ethical work. No mapping	L2
2	CO4	PO10	-	No usage for communication. No mapping.	L2
2	CO4	PO11	-	No project management and finance. No mapping.	L2
2	CO4	PO12	-	No mapping as there is only understanding	L2
3	CO5	PO1	L2	Understanding the Concepts of arrays	L2
3	CO5	PO2	L3	Analyse the problem by using the knowledge of arrays	L2
3	CO5	PO3	L3	Design and develop the program requires the knowledge of arrays.	L2
3	CO5	PO4	-	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	L2
3	CO5	PO5	-	No tool content. No mapping	L2
3	CO5	PO6	-	No social, cultural issues. No mapping	L2
3	CO5	PO7	-	No impact on Environment and sustainability. No mapping	L2
3	CO5	PO8	-	No team work or lead for the ethical work. No mapping	L2
3	CO5	PO9	-	No team work or lead for the ethical work. No mapping	L2
3	CO5	PO10	-	No usage for communication. No mapping.	L2

3	CO5	PO11	-	No project management and finance. No mapping.	L2
3	CO5	PO12	-	No mapping as there is only understanding	L2
3	CO6	PO1	L2	Understanding the Concepts of arrays	L3
3	CO6	PO2	L3	Analyse the problem by using the knowledge of arrays	L3
3	CO6	PO3	L3	Design and develop the algorithms for sorting and searching techniques	L3
3	CO6	PO4	-	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	L3
3	CO6	PO5	-	No tool content. No mapping	L3
3	CO6	PO6	-	No social, cultural issues. No mapping	L3
3	CO6	PO7	-	No impact on Environment and sustainability. No mapping	L3
3	CO6	PO8	-	No team work or lead for the ethical work. No mapping	L3
3	CO6	PO9	-	No team work or lead for the ethical work. No mapping	L3
3	CO6	PO10	-	No usage for communication. No mapping.	L3
3	CO6	PO11	-	No project management and finance. No mapping.	L3
3	CO6	PO12	-	No mapping as there is only understanding	L3
4	CO7	PO1	L2	Understanding the modular representation of a program,,	L2
4	CO7	PO2	L3	Analyze the problem requires the knowledge of elements of functions	L2
4	CO7	PO3	L3	Design and develop the program requires the knowledge of functions	L2
4	CO7	PO4	-	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	L2
4	CO7	PO5	-	No tool content. No mapping	L2
4	CO7	PO6	-	No social, cultural issues. No mapping	L2
4	CO7	PO7	-	No impact on Environment and sustainability. No mapping	L2
4	CO7	PO8	-	No team work or lead for the ethical work. No mapping	L2
4	CO7	PO9	-	No team work or lead for the ethical work. No mapping	L2
4	CO7	PO10	-	No usage for communication. No mapping.	L2
4	CO7	PO11	-	No project management and finance. No mapping.	L2
4	CO7	PO12	-	No mapping as there is only understanding	L2
4	CO8	PO1	L2	Understanding the Concept of recursion,,.	L3
4	CO8	PO2	L3	Analyze the problem requires the knowledge of elements of functions	L3
4	CO8	PO3	L3	Design and develop the program requires the knowledge of recursion	L3
4	CO8	PO4	-	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	L3
4	CO8	PO5	-	No tool content. No mapping	L3
4	CO8	PO6	-	No social, cultural issues. No mapping	L3
4	CO8	PO7	-	No impact on Environment and sustainability. No mapping	L3
4	CO8	PO8	-	No team work or lead for the ethical work. No mapping	L3
4	CO8	PO9	-	No team work or lead for the ethical work. No mapping	L3
4	CO8	PO10	-	No usage for communication. No mapping.	L3
4	CO8	PO11	-	No project management and finance. No mapping.	L3
4	CO8	PO12	-	No mapping as there is only understanding	L3
5	CO9	PO1	L2	Understanding the Concept of Structures	L3
5	CO9	PO2	L3	Analyze the problem requires the knowledge of elements of Structures	L3
5	CO9	PO3	L3	Design and develop the program requires the knowledge of Structures	L3
5	CO9	PO4	-	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	L3
5	CO9	PO5	-	No tool content. No mapping	L3
5	CO9	PO6	-	No social, cultural issues. No mapping	L3
5	CO9	PO7	-	No impact on Environment and sustainability. No mapping	L3
5	CO9	PO8	-	No team work or lead for the ethical work. No mapping	L3
5	CO9	PO9	-	No team work or lead for the ethical work. No mapping	L3
5	CO9	PO10	-	No usage for communication. No mapping.	L3
5	CO9	PO11	-	No project management and finance. No mapping.	L3

5	CO9	PO12	-	No mapping as there is only understanding	L3
5	CO10	PO1	L2	Understanding the Concept of Pointers	L3
5	CO10	PO2	L3	Analyze the problem requires the knowledge of Pointers	L3
5	CO10	PO3	L3	Design and develop the program requires the knowledge of Pointers	L3
5	CO10	PO4	-	No investigation & interpretation content. No mapping. Learning is at the basic level. Attainment will be Zero, if mapping done.	L3
5	CO10	PO5	-	No tool content. No mapping	L3
5	CO10	PO6	-	No social, cultural issues. No mapping	L3
5	CO10	PO7	-	No impact on Environment and sustainability. No mapping	L3
5	CO10	PO8	-	No team work or lead for the ethical work. No mapping	L3
5	CO10	PO9	-	No team work or lead for the ethical work. No mapping	L3
5	CO10	PO10	-	No usage for communication. No mapping.	L3
5	CO10	PO11	-	No project management and finance. No mapping.	L3
5	CO10	PO12	-	No mapping as there is only understanding.	L3

4. Articulation Matrix

CO – PO Mapping with mapping level for each CO-PO pair, with course average attainment.

-	-	Course Outcomes	Program Outcomes														-
Modules	CO.#	**At the end of the course student should be able to . . .**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	Level
1	18CPS13.1	Understand the working of computer system.	2.2															L2
1	18CPS13.2	Understand the procedure to write a C program using operators and expressions.	2.2															L2
2	18CPS13.3	Understand to read and write the data using Input & Output library functions.	2.2															L2
2	18CPS13.4	Understand to construct a programming solution to a given problem using Branching & Looping constructs.	2.2	2.2														L2
3	18CPS13.5	Describe the linear representation of data using arrays.	2.2	2.2	2.3													L2
3	18CPS13.6	Develop Algorithms for data arrangement & probing using Searching & Sorting technique.	2.2	2.2	2.3													L3
4	18CPS13.7	Understand Modular representation of program using User-Defined functions.	2.2	2.2	2.3													L2
4	18CPS13.8	Develop a C program using Recursion.	2.2	2.2	2.3													L3
5	18CPS13.9	Develop a C program to store the data of different types using structures.	2.2	2.2	2.3													L3
5	18CPS13.10	Develop a C program to store the address of a variable using Pointers.	2.2	2.2	2.3													L3
-	**18CPS13**	**Average attainment (1, 2, or 3)**	**2.2**	**2.2**	**2.3**													**-**
-	*PO, PSO*	*1.Engineering Knowledge; 2.Problem Analysis; 3.Design / Development of Solutions; 4.Conduct Investigations of Complex Problems; 5.Modern Tool Usage; 6.The Engineer and Society; 7.Environment and Sustainability; 8.Ethics; 9.Individual and Teamwork; 10.Communication; 11.Project Management and Finance; 12.Life-long Learning; S1.Software Engineering; S2.Data Base Management; S3.Web Design*																

5. Curricular Gap and Content

Topics & contents not covered (from A.4), but essential for the course to address POs and PSOs.

Modules	Gap Topic	Actions Planned	Schedule Planned	Resources Person	PO Mapping

6. Content Beyond Syllabus

Topics & contents required (from A.5) not addressed, but help students for Placement, GATE, Higher Education, Entrepreneurship, etc.

Modules	Gap Topic	Area	Actions Planned	Schedule Planned	Resources Person	PO Mapping
1						
1						
2						
2						
3						
3						
4						
4						
5						
5						

C. COURSE ASSESSMENT

1. Course Coverage

Assessment of learning outcomes for Internal and end semester evaluation. Distinct assignment for each student. 1 Assignment per chapter per student. 1 seminar per test per student.

Modules	Title	Teach. Hours	No. of question in Exam						CO	Levels
			CIA-1	CIA-2	CIA-3	Asg	Extra Asg	SEE		
1	Introduction to computer Hardware and Software, Overview of C.	08	2	-	-	1	-	2	CO1, CO2	L2,L2
2	Managing Input and output operations, Conditional Branching and loops.	08	2	-	-	1	-	2	CO3, CO4	L2,L2
3	Arrays, Basic algorithms.	08	-	2	-	1	-	2	CO5, CO6	L2, L3
4	User-defined functions and Recursion.	08	-	2		1	-	2	CO7, C08	L2, L3
5	Structures and Pointers, Preprocessor Directives.	08	-	-	4	1	-	2	CO9, CO10	L3,L3
-	**Total**	**40**	**4**	**4**	**4**	**5**	**-**	**10**	**-**	**-**

2. Continuous Internal Assessment (CIA)

Assessment of learning outcomes for Internal exams. Blooms Level in last column shall match with A.2.

Modules	Evaluation	Weightage in Marks	CO	Levels
1, 2	CIA Exam – 1	30	CO1, CO2, CO3, CO4	L2, L2, L2, L2
3, 4	CIA Exam – 2	30	CO5, CO6, CO7, C08	L2, L3, L2, L3
5	CIA Exam – 3	30	CO9, CO10	L3, L3
1, 2	Assignment-1	10	CO1, CO2, CO3, CO4	L2, L2, L2, L2
3, 4	Assignment -2	10	CO5, CO6, CO7, C08	L2, L3, L2, L3
5	Assignment -3	10	CO9, CO10	L3, L3

1, 2	Seminar-1	-	-	-
3, 4	Seminar- 2	-	-	-
5	Seminar -3	-	-	-
1, 2	Quiz- 1	-	-	-
3, 4	Quiz- 2	-	-	-
5	Quiz- 3	-	-	-
1-5	Other Activities – Mini Project	-	-	-
	Final CIA Marks	**40**	**-**	**-**

D1. TEACHING PLAN -1

Module – 1

Title:	Introduction to computer Hardware and Software, Overview of C	Appr Time:	08 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Understand the working of computer system.	CO1	L2
2	Understand the procedure to write a C program using operators and expressions.	CO2	L2
b	***Course Schedule***	-	-
Class No	**Portion covered per hour**	**CO**	**Level**
1	Introduction to computer Hardware and software: Computer generations, computer types, bits, bytes and words, CPU	C01	L1
2	Primary memory, Secondary memory, ports and connections, input devices, output devices	C01	L2
3	Computers in a network, Network hardware, Software basics, software types	C01	L2
4	Overview of C: Basic structure of C program,	C02	L2
5	executing a C program	C02	L2
6	Constant, variable, data types	C02	L2
7	Operators and expressions	C02	L2
8	Operators and expressions	C02	L2
c	**Application Areas**	**CO**	**Level**
1	Web applications, development tools, image editing programs, and communication programs	CO1	L2
2	To create computer applications, embedded softwares.	CO2	L2
d	**Review Questions**	-	-
1	What is a Computer? Explain the parts of Computer.	CO1	L1
2	Define i) bits ii) bytes iii)words	CO1	L1
3	Explain Input and Output devices in detail.	CO1	L2
4	List and explain basic components of computer network.	CO1	L2
5	Define Software. Explain its types.	CO1	L2
6	What is a token? What are different types of tokens available in C language? explain	CO2	L2
7	Explain structure of C program with an example.	CO2	L2
8	Define: i) variable ii) Constant iii) Associativity iv) precedence.	CO2	L2
9	Explain any five operators used in C language.	CO2	L2
10	What are data types? Mention the different data types supported by C language, giving an example to each.	CO2	L2
11	Write a C program to find area of a circle.	CO2	L2
12	What is an algorithm? Write an algorithm to find largest of 3 numbers	CO2	L2

13	Convert the following mathematical expressions into C equivalent: i) area= $\sqrt{s(s-a)(s-b)(s-c)}$ ii) x= -b + $\sqrt{b2-4ac}$ /2a	CO2	L2
e	**Experiences**	-	-
1			
2			
3			
4			

Module – 2

Title:	Managing Input and output operations, Conditional Branching and loops	Appr Time:	8 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Understand to read and write the data using Input & Output library functions	CO3	L2
2	Understand to construct a programming solution to a given problem using Branching & Looping constructs	CO4	L2
b	***Course Schedule***	-	-
Class No	**Portion covered per hour**	**CO**	**Level**
9	Managing Input and output operations, Introduction.	CO3	L2
10	Reading a character, writing a character.	CO3	L2
11	Formatted input and Formatted output, sample program	CO3	L2
12	Decision Making-Introduction, Decision making with IF statements, SWITCH statements , Break statements, Continue statements and GOTO statements	CO4	L2
13	Branching and Looping- Introduction, WHILE statements, Do-While Switch statements, If-Then-else and its sample programs	CO4	L2
14	Finding roots of a quadratic equations	CO4	L2
15	computation of binomial coefficients	CO4	L2
16	plotting of Pascals triangle.	CO4	L2
c	**Application Areas**	**CO**	**Level**
1	Computer-aided design, graphical user interfaces, image processing	CO3	L2
2	banking sectors, Theory of Algebra, In Number theory, DNA sequences	CO4	L2
d	**Review Questions**	-	-
14	Explain printf and scanf functions with example.	CO3	L2
15	List all the conditional control statements used in C. Write a C program to find the biggest of three numbers.	CO4	L2
16	Implement a C program to find the reverse of an integer number and check whether it is palindrome or not.	CO3	L2
17	Explain SWITCH statement, with syntax and example.	CO4	L2
18	Differentiate between WHILE and DO-WHILE loops.	CO4	L2
19	Develop a C program to read a year as an input and find whether it is Leap or not.	CO4	L2
20	Explain the syntax of WHILE statement. Write a C program to check the given number is palindrome or not.	CO4	L2
21	Distinguish between the following: i) goto and if ii) break and continue	CO4	L2
22	List all the branching statements and Looping statements.	CO4	L2
23	List all unconditional statements and explain with syntax.	CO4	L2
e	**Experiences**		
1			

2			
3			
4			
5			

E1. CIA EXAM – 1

a. Model Question Paper – 1

Crs Code:		18CPS13	Sem:	1	Marks:	30	Time:	90 minutes		
Course:		C programming for problem solving								
-	**-**	**Note: Answer all questions, each carry equal marks. Module : 1, 2**						**Marks**	**CO**	**Level**
		MODULE-1								
1	a	What is Computer? Explain its parts.						03	CO1	L1
	b	Explain primary and secondary memory devices in detail.						04	CO1	L2
	c	List all operators supported in C. Explain relational, logical and bitwise operator with example.						05	CO2	L2
	d	Write a C program to find the area of triangle, when we know the length of all three sides.						03	CO2	L2
		OR								
2	a	Explain input and output devices with example						04	CO1	L2
	b	Explain different network topologies with relevant diagram						05	CO1	L2
	c	What is a variable? Explain the rules for constructing variables in c language						04	CO2	L2
	d	Convert the following mathematical expressions into C expressions: I) $\frac{x}{b+c} + \frac{y}{b-c}$ ii) a + $\frac{b(ad+e)}{b-a} - \frac{c}{d}$						02	CO2	L2
3	a	Explain with syntax and example: i) Input() ii) Output()						04	CO3	L2
	b	Explain the two way selection(if, if-else, nested if-else, cascaded if-else) in C language with syntax						04	CO4	L2
	c	Write a program to find area and perimeter of a circle						03	CO4	L2
	d	Using Switch statement implement simple calculator program						04	CO4	L2
		OR								
4	a	Write the guidelines to use scanf() & printf() functions in C language						03	CO3	L2
	b	Write a C program to find the roots of Quadratic equation						04	CO4	L2
	c	What is a loop? Explain the different loops in C language						04	CO4	L2
	d	Write a C program to compute binomial coefficients						04	CO4	L2

b. Assignment -1

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions									
Crs Code:	18CPS13	Sem:	1	Marks:	5 / 10	Time:	90 – 120 minutes		
Course:	C programming for problem solving								
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.									
SNo	**USN**	**Assignment Description**					**Marks**	**CO**	**Level**
1		Write a note on generations of computer.						CO1	L1
2		Explain input and Output Devices in detail.						CO1	L2
3		Explain Primary memory and secondary memory storage.						CO1	L2
4		Explain Network Typologies						CO1	L2
5		Define the following: i) bits ii) bytes iii) words						CO1	L2
6		Define Software. Explain its types.						CO1	L2
7		Write basic structure of C program and explain its different sections.						CO2	L2

8		What are the rules to be followed to declare an identifier with example.		CO2	L2
9		Define C tokens. List and explain different c-tokens.		CO2	L2
10		List and Explain all the operators supported in C with an example.		CO2	L2
11		Evaluate the following expressions: i) 100% 20<=20-5 + 100% 10 – 20 == 5 >=1!=20 ii) a+=b *=c -=5 where a = 3 b=5 and c=8		CO2	L2
12		write a C program to demonstrate working of these logical operators.		CO2	L2
13		Explain formatted input output statements in C with syntax and example. Write a C program to find the area and perimeter of a rectangle		CO3	L2
14		What is two-way selection statement? Explain if, if else and cascaded if-else with examples.		CO4	L2
15		Explain the different types of loops used in C with syntax and example for each		CO4	L2
16		Explain the use of break and continue statement in loops with example		CO4	L2
17		Explain the Switch statement with syntax and example		CO4	L2
18		Explain Ternary operator with suitable example		CO4	L2
19		Write a C program to find the roots of Quadratic equation.		CO4	L2
20		Write a C program to convert a decimal number to binary form		CO4	L2
21		Write a C program to find the sum of series $1+x+x^2+x^3+.....+x^n$.		CO4	L2
22		Write a C program to plot a Pascals triangle		CO4	L2

D2. TEACHING PLAN-2

Module – 3

Title:	Arrays, Character arrays and strings, Basic Algorithms	Appr Time:	08 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Describe the linear representation of data using arrays.	CO5	L2
2	Develop Algorithms for data arrangement & probing using Searching & Sorting technique.	CO6	L3
b	***Course Schedule***		
Class No	**Portion covered per hour**	**CO**	**Level**
17	Arrays(1-Dimensional,2-Dimensional),Declaration, Characteristics, Initialization.	CO5	L2
18	Character arrays, Declaration and Initialization of Strings.	CO5	L2
19	Display of strings with different formats.	CO5	L2
20	string standard functions, string arrays	CO5	L2
21	Searching and Sorting Algorithms -Linear search	CO6	L3
22	Binary search	CO6	L3
23	Bubble sort	CO6	L3
24	Selection sort	CO6	L3
c	**Application Areas**	**CO**	**Level**
1	Computer Graphics, Database Management system	CO5	L2
2	Banking sectors	CO6	L3
d	**Review Questions**	-	-
1	What is an ARRAY? Explain the different ways of initializing an array with example	CO5	L2
2	Write a C program to find sum of array elements by passing array as function argument	CO5	L2
3	Explain the different ways of declaring an array with example	CO5	L2

4	Explain any four string manipulation library function with example	CO5	L2
5	What is string? Write a C program that reads a sentence and prints the frequency of each of the vowels and total count of consonants	CO5	L3
6	Write a C program to search a name in a list of names using Binary Searching technique	CO6	L3
7	Write a C program to sort the given array elements in ascending order by selection sort	CO6	L3
8	Write a C program to concatenate two strings without using built-in function strcat()	CO5	L2
9	Explain with program: i) String Reverse ii) String Copy iii) String Compare	CO5	L2
10	Write a C program to implement string copy operation STRCOPY(str1,str2) that copies a string str1 to another str2 without using Library function	CO5	L2
e	**Experiences**	-	-
1			
2			
3			
4			
5			

Module – 4

Title:	User Defined Functions and Recursion	Appr Time:	08 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Understand Modular representation of program using User-Defined functions	CO7	L2
2	Develop a C program using Recursion	CO8	L3
b	***Course Schedule***		
Class No	**Portion covered per hour**	**CO**	**Level**
25	Introduction, Elements of function	CO7	L2
26	Types of functions	CO7	L2
27	Types of functions	CO7	L2
28	Function Prototype	CO7	L2
29	Function Prototype	CO7	L2
30	Recursion-Definition, Example programs using recursion	CO8	L3
31	Finding Factorial of a positive integers	CO8	L3
32	Finding Fibonacci series of a number using recursion	CO8	L3
c	**Application Areas**	**CO**	**Level**
1	Database Management system.	CO7	L3
2	Combinatorial problems, Dynamic programming.	CO8	L3
d	**Review Questions**	-	-
11	Define User-defined function? Write a function to find the sum of two numbers	CO7	L2
12	Write a C program that invokes the function isprime() that accepts an integer argument and returns 1 if argument is isprime() else 0	CO7	L2
13	Explain the types of function based on parameters	CO7	L2
14	Define the following: i) Actual parameter ii) Formal parameter	CO7	L2
15	Explain with example to each i) function call ii) function definition iii) function prototype	CO7	L2
16	Write a function power that computes x raised to the power y for integers x and y and returns double type value	CO7	L2
17	Write a C program to find the square root of a given number N using user defined function	CO7	L2
18	Write a C program to compute sin(x) using Taylor series.	CO7	L2
19	Define Recursion. Write a C program to find the Fibonacci series using recursion	CO8	L3

20	Write a C program to find the factorial of a given number.	CO8	L3
e	**Experiences**	-	-
1			
2			
3			
4			
5			

E2. CIA EXAM – 2

a. Model Question Paper – 2

Crs Code:	18CPS13	Sem:	1	Marks:	30	Time:	90 minutes		
Course:	C programming for problem solving								
-	**-**	**Note: Answer all questions, each carry equal marks. Module : 3, 4**					**Marks**	**CO**	**Level**
1	a	What is an array? Explain different methods of initialization and declaration of one dimensional array					03	CO5	L2
	b	Write a C program to implement Matrix multiplication using two dimensional arrays					04	CO5	L2
	c	Write a C program to concatenate 2 strings without using Built-in function					05	CO5	L2
	d	List different types of searching techniques and explain any one					03	CO6	L2
		OR							
2	a	What is an array? Explain different methods of initialization and declaration of two dimensional array					04	CO5	L2
	b	Write a C program to sort the given array elements in descending order using bubble sort					05	CO5	L2
	c	Explain all String manipulation library functions with examples					04	CO5	L2
	d	List different types of sorting techniques and explain any one					02	CO6	L2
3	a	What is a function? Explain two categories of argument passing techniques with examples					04	CO7	L2
	b	Explain the following with an example: i)function call ii) function definition iii) function prototype					03	CO7	L2
	c	Write a C program to find the sum of array elements by passing array as function argument					04	CO7	L2
	d	Write a C program to find factorial of a positive integer					04	CO8	L3
		OR							
4	a	What are actual and formal parameters					03	CO7	L2
	b	Write a C program to implement string operations without using built-in functions					04	CO7	L3
	c	Write a C program to implement Tower of hanoi using recursion					04	CO8	L3
	d	Write a C program to find prime or not using Recursion					04	CO8	L3

b. Assignment – 2

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions							
Crs Code:	18CPS13	Sem:	1	Marks:	5 / 10	Time:	90 – 120 minutes
Course:	C Programming for Problem Solving				Module:3,4		
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.							

SNo	USN	Assignment Description	Marks	CO	Level
1		What is an array? Explain the declaration and initialization of one dimensional arrays with example		CO5	L2
2		Explain the declaration and initialization of two dimensional arrays with example		CO5	L2
3		Write a C program to read N integers into an array A and to		CO5	L2

		i)find the sum of odd numbers ii) find the sum of even numbers iii) find the average of all numbers Output the results computed with appropriate headings			
4		How string is declared and Initialized? Explain any Four string manipulation functions with examples		CO5	L2
5		Write a C Program to sort the given array elements in ascending order by Bubble sort technique		CO6	L3
6		Write a C Program to search a key element in an array using linear search technique		CO6	L3
7		What is function? Explain two categories of argument passing techniques with examples		CO7	L2
8		Write a C program to find cube of a number using function		CO7	L2
9		Explain the elements of User defined function		CO7	L2
10		Explain function call, function definition and function prototype with example to each		CO7	L2
11		What are actual parameters and formal parameters? Illustrate with example.		CO7	L2
12		What is recursion? Write a C program to compute the factorial of a given number 'n' using recursion.		CO8	L3
13		Write a C program to compute polynomial coefficient ${}^{n}C_{r}$ using recursion.		CO8	L3

D3. TEACHING PLAN-3

Module – 5

Title:	Structure and Pointers, Preprocessor Directives	Appr Time:	08 Hrs
a	***Course Outcomes***	-	**Blooms**
-	The student should be able to:	-	**Level**
1	Develop a C program to store the data of different types using structures	CO9	L3
2	Develop a C program to store the address of a variable using Pointers and usage of Preprocessor directives	CO10	L3
b	***Course Schedule***		
Class No	**Portion covered per hour**	**CO**	**Level**
33	Structure Definition, declaration of structures	CO9	L3
34	Initialization, structure within structure	CO9	L3
35	array of structures	CO9	L3
36	pointer to structures	CO9	L3
37	declaration of pointers, Pointer Definition, Initialization of pointers	CO10	L3
38	Accessing a variable, Array of pointers, pointers and structures	CO10	L3
39	void pointers, sample programs	CO10	L3
40	Preprocessor Directives- macro substitution, inclusion	CO10	L3
c	**Application Areas**	**CO**	**Level**
1	Computer Architecture.	CO9	L3
2	System programming.	CO10	L3
d	**Review Questions**	-	-
1	What is structure? Explain its declaration and initialization with an example	CO9	L3
2	Write a C program to pass structure variable as function arguments	CO9	L3
3	Write a note on the following with an example for each: I) Arrays of structures ii) arrays within structures iii) structures within structures	CO9	L3
4	Show how a structure variable is passed as a parameter to a function, with an example	CO9	L3
5	How structure is different from an array? Explain declaration of structure with an example	CO9	L3

6	Define point variable. Explain with an example, the declaration and Initialization of variable	CO10	L3
7	Write the difference between array and structure	CO9	L3
8	Give the advantages and disadvantages of pointer datatype	CO10	L3
9	Write and Explain any five preprocessor directives in C	CO10	L3
10	Explain malloc(),calloc() functions with examples	CO10	L3
e	**Experiences**	-	-
1			
2			
3			
4			
5			

E3. CIA EXAM – 3

a. Model Question Paper – 3

Crs Code:	18CPS13	Sem:	1	Marks:	30	Time:	90 minutes
Course:	C Programming for Problem Solving						

-	-	**Note: Answer all questions, each carry equal marks. Module: 5**	**Marks**	**CO**	**Level**
1	a	Define structure? Write a C program to store and print name, USN, subject and IA marks of students using structure	05	CO9	L3
	b	Explain array of pointers with example	05	CO10	L3
	c	Explain #define and #include preprocessor directives	05	CO10	L3
		OR			
2	a	Explain the C syntax of structure declaration and initialization with an example	05	CO9	L3
	b	Explain how the structure variable passed as a parameter to a function with example	06	CO9	L3
	c	Explain with syntax: i) puts() ii) gets() iii) getchar() iv) putchar()	04	CO10	L3
3	a	Give advantages and disadvantages of pointers in C. Write a program in C to find the sum, mean and standard deviation of all elements of array using pointer technology	10	CO10	L3
	b	Explain any five preprocessor directives in C	05	CO10	L3
		OR			
4	a	Define pointer. Explain with an examples with declaration and Initialization of a pointer variable	05	CO10	L3
	b	Write a C program to swap two numbers using call by pointers(address) method	05	CO10	L3
	c	Define file. Explain all file operations with syntax and example	05	CO10	L3

b. Assignment – 3

Note: A distinct assignment to be assigned to each student.

Model Assignment Questions							
Crs Code:	18CPS13	Sem:	1	Marks:	5 / 10	Time:	90 – 120 minutes
Course:	C Programming for Problem Solving						
Note: Each student to answer 2-3 assignments. Each assignment carries equal mark.							

SNo	**USN**	**Assignment Description**	**Marks**	**CO**	**Level**
1		What is Structured datatype? Explain		CO9	L3
2		Explain the concept of array of structures, with a suitable C program		CO9	L3
3		Write a C program to maintain a record of 'n' employee detail using an array of structures with three fields (id, name, salary) and print the details of employees whose salary is above		CO9	L3

		Rs.10,000			
4		Explain structure within structure with an example.		CO9	L3
5		What is a pointer? Write a C program to find the sum and mean of all elements in an array using pointers.		CO10	L3
6		Write a C program to swap two numbers using call by pointer method.		CO10	L3
7		Explain how pointers and arrays are related with example		CO10	L3
8		Write a C program to copy one file to another file without using built in function.		CO10	L3

F. EXAM PREPARATION

1. University Model Question Paper

Course:		C Programming for Problem Solving						Month / Year		January /2020	
Crs Code:		18CPS13	Sem:	1	Marks:	100		Time:		180 minutes	
-	**Note**	Answer all FIVE full questions. All questions carry equal marks.							**Marks**	**CO**	**Level**
1	a	Explain the components required to process the data in a computer							04	CO1	L1
	b	What is the need of network topologies. Explain the following network topologies i) Bus topology ii) star topology iii) ring topology							06	CO1	L1
	c	Define C tokens. List and explain different C tokens							06	CO2	L2
	d	What is an Identifier? Give any 5 rules that are to be followed, while declaring a variable							04	CO2	L2
		OR									
-	a	Explain the categories of hardware devices							04	CO1	L1
	b	List all the operators supported in C. Explain relational, logical and bitwise operators							06	CO2	L2
	c	Write a C program to find the area and perimeter of a rectangle							05	CO2	L2
	d	Convert the following mathematical expressions into C equivalent: i) area= $\sqrt{s(s-a)(s-b)(s-c)}$ ii) x= -b + $\sqrt{b2-4ac}$ /2a							05	CO2	L2
2	a	Explain formatted input output statements in C with syntax and example.							04	CO3	L2
	b	What is two-way selection statement? Explain if, if-else, nested if-else and cascaded if-else with syntax and examples							08	CO4	L2
	c	List the types of loops. Explain the working of any one type of loop with syntax and example							05	CO4	L2
	d	Develop a C program to read a year as an input and find whether it is leap year or not							03	CO4	L2
		OR									
	a	Write the guidelines to use printf() function in c language							03	CO3	L2
	b	Explain SWITCH statement, with syntax and example							06	CO4	L2
	c	Write a program to find the reverse of a number and check whether it is a palindrome or not							06	CO4	L2
	d	Distinguish between the following: i) goto and if ii) break and continue							05	CO4	L2
3	a	What is an ARRAY? Explain the different ways of initializing an array with example							04	CO5	L2
	b	Write a C program to read N integers into an array A and to i)find the sum of odd numbers ii) find the sum of even numbers iii) find the average of all numbers.Output the results computed with appropriate headings.							06	CO5	L2
	c	Write a C program to concatenate two strings without using built in function strcat()							05	CO6	L3
	d	Write a C program to search a name in a list of names using binary searching technique							05	CO6	L3
		OR									

	a	Write the syntax for declaring two-dimensional array and initialize the same with suitable example.	04	CO5	L2
	b	Explain any four string manipulation library functions with example.	06	CO6	L2
	c	Write a C Program to sort the given array elements in ascending order by Bubble sort technique.	05	CO6	L3
	d	Write a C Program to search a key element in an array using linear search technique.	05	CO6	L3
4	a	What is function? Explain the declaration and initialization of single dimensional array with example.	04	CO7	L2
	b	What are actual parameters and formal parameters? Illustrate with example	04	CO7	L2
	c	What is Recursion? Write a C program to compute the factorial of a given number 'n' using recursion.	06	C08	L3
	d	Write a C program to compute polynomial coefficient ^nC_r using recursion	06	CO8	L3
		OR			
	a	Explain function call, function definition and function prototype with example to each.	06	CO7	L2
	b	Write a C program to check a number is a prime number or not using recursion.	06	CO8	L3
	c	Write a C program to find the Fibonacci series using recursion	04	CO8	L3
	d	Explain the two categories of argument passing techniques, with example	04	CO7	L2
5	a	Define structure? Write a C program to store and print name, USN, subject and IA marks of students using structure	06	CO9	L3
	b	Explain structure declaration and initialization with an example	04	CO9	L3
	c	Write a C program to swap two numbers using call by pointers(address) method	05	CO10	L3
	d	Explain any five preprocessor directives in C	05	CO10	L2
		OR			
	a	Write a note on the following with an example for each: I) Arrays of structures ii) arrays within structures iii) structures within structures	06	CO9	L3
	b	What is a pointer? Explain with an examples with declaration and Initialization of a pointer variable	04	CO10	L3
	c	Write a C program to find the sum and mean and standard deviation of all elements in an array using pointers	06	C010	L3
	d	Give the advantages and disadvantages of pointer datatype	04	CO10	L2

2. SEE Important Questions

Course:	C Programming for Problem Solving					Month / Year	January /2020
Crs Code:	18CPS13	Sem:	1	Marks:	100	Time:	180 minutes

	Note	Answer all FIVE full questions. All questions carry equal marks.	-	-	
Module	Qno.	Important Question	**Marks**	**CO**	**Year**
1	1	Explain the categories of hardware devices	10	CO1	2010
	2	Explain the components required to process the data in a computer	07	CO1	2010
	3	Mention the various steps associated with information processing cycle and explain them	08	CO1	2011
	4	Mention the different storage devices and explain one o f them	04	CO1	2011
	5	What is the need of network topologies. Explain the following network topologies i) Bus topology ii) star topology iii) ring topology	08	CO1	2010
	6	Write basic structure of C program and explain its different sections	08	C02	2018
	7	Define C tokens. List and explain different C tokens	10	CO2	2015
	8	Explain the following operators in C language: i) Relational ii) Logical iii) Conditional	08	CO2	2016
	9	Write a C program to find the area and perimeter of a rectangle	06	CO2	2016

	10	Write a note on different types of Type conversions, with an example for each	08	CO2	2017
	11	List all the operators supported in C. Explain relational, logical and bitwise operators	08	CO2	2018
	12	Write a C program to find area of a triangle,when we know the lengths of all three of its sides	08	CO2	2018
	13	What is an Identifier? Give any 5 rules that are to be followed, while declaring a variable	04	CO2	2015
2	1	Explain scanf() and printf() function in C language with syntax and examples	08	CO3	2016
	2	Explain different types of input and output functions in C with syntax and examples	06	CO3	2017
	3	Write the syntax of nested if..else statement and explain its working	08	CO4	2018
	4	What is two-way selection statement? Explain if, if-else,nested if-else and cascaded if-else with syntax and examples	10	CO4	2015
	5	Explain switch statement with an example	06	CO4	2015
	6	List the types of loops. Explain the working of any one type of loop with syntax and example	08	CO4	2016
	7	Write a program to find the reverse of a number and check whether it is a palindrome or not	06	CO4	2016
	8	Distinguish between the following: i) goto and if ii) break and continue	04	CO4	2018
	9	Write a C program to find the roots of quadratic equation	10	CO4	2018
	10	Develop a C program to read a year as an input and find whether it is leap year or not	04	CO4	2017
3	1	Define an array. Write the syntax for declaring two-dimensional array and initialize the same with suitable example	10	CO5	2018
	2	What is an array? How is a single dimensional array is declared and initialized.	06	CO5	2015
	3	Write a C program to read N integers into an array A and to i)find the sum of odd numbers ii) find the sum of even numbers iii) find the average of all numbers Output the results computed with appropriate headings	06	C05	2015
	4	Write a C program to search a name in a list of names using binary searching technique	08	C06	2016
	5	Explain any four string manipulation library functions with example.	08	CO6	2017
	6	What is string? Write a C program that reads a sentence and prints the frequency of each of the vowels and total count of consonants	06	CO5	2016
	7	Write a C program to concatenate two strings without using built in function strcat()	05	CO6	2015
4	1	What is function? Explain the declaration and initialization of single dimensional array with example	05	CO7	2015
	2	Explain the types of function based on parameters	05	CO7	2015
	3	Explain the two categories of argument passing techniques,with example	06	CO7	2015
	4	Explain function call, function definition and function prototype with example to each	06	CO7	2015
	5	What is Recursion? Write a C program to compute the factorial of a given number 'n' using recursion.	08	CO8	2007
	6	Write a C program to check a number is a prime number or not using recursion	06	CO8	2015
	7	Write a C program to compute polynomial co-efficient $^{n}c_{r}$ using recursion	04	CO8	2016
	8	Write a C program to compute the factorial of a given number 'n' using recursion	08	CO8	2018
5	1	What is structure? Explain the C syntax of structure declaration with example	04	CO9	2016

	2	Explain structure within structure with an example	08	CO9	2018
	3	Write a C program to pass structure variable as function argument	07	CO9	2015
	4	Write a C program to store and print name, USN, subject and IA marks of student using structure	08	CO9	2015
	5	Write a C program using pointers to compute the sum, Mean and standard deviation of all elements stored in an array of 'n' real numbers	06	CO9	2017
	6	What is pointer? Explain how the pointer is declared and initializes	04	CO10	2016
	7	Explain the array of pointers with example	04	CO10	2016
	8	Write a C program to swap two numbers using call by pointers(address) method	06	CO10	2016
	9	Explain any four preprocessor directives in C with example for each	08	CO10	2018

G. Content to Course Outcomes

1. TLPA Parameters

Table 1: TLPA – Example Course

Module-#	Course Content or Syllabus (Split module content into 2 parts which have similar concepts)	Content Teaching Hours	Blooms' Learning Levels for Content	Final Blooms' Level	Identified Action Verbs for Learning	Instruction Methods for Learning	Assessment Methods to Measure Learning
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*
1	Introduction to computer Hardware and software: Computer generations, computer types, bits, bytes and words, CPU, Primary memory, Secondary memory, ports and connections, input devices, output devices, Computers in a network, Network hardware, Software basics, software types.	3	- L1 - L2	L2	- Understand -	- Lecture - -	- Q&A -Assignment
1	Overview of C: Basic structure of C program, executing a C program-Compilation and linking processes, Constant such as Integer, Real, Floating point, character, string constants, variable declaration and Initialization data types-Void, Integer, Floating Point, Character,Logical data Operators and expressions.	5	-L1 - L2	L2	- Understand -	- Lecture - -	- Q&A -Assignment
2	Managing Input and output operations-Introduction, Reading a character, writing a character, Formatted input and Formatted output, sample program.	3	- L1 - L2	L2	- Understand -	- Lecture -	- Q&A -Assignment
2	Decision Making-Introduction, Decision making with IF statements, SWITCH statements, Break statements, Continue statements and GOTO statements. Branching and Looping- Introduction, WHILE statements, Do-While, Switch statements, If-Then-else and its sample programs Finding roots of a quadratic equation, computation of binomial coefficients, plotting of Pascals triangle.	5	- L1 - L2	L2	- Understand -	- Lecture -	- Q&A -Assignment
3	Arrays: Arrays (1-Dimensional, 2-Dimensional),Declaration, Characteristics, Initialization, Character arrays and Strings	4	- L1 - L2	L2	- Understand -	- Lecture -	- Q&A -Assignment
3	Basic Algorithms: Searching and Sorting Algorithms (Linear search, Binary search, Bubble sort and Selection sort).	4	- L2 - L3	L3	-Develop -	- Lecture	- Q&A -Assignment
4	User Defined Functions-Introduction, Elements of function, Types of functions, Function	5	- L1 - L2	L2	- Understan	- Lecture -	- Q&A -Assignment

	Prototype.				d -		
4	Recursion-Definition, Example programs, Finding Factorial of a positive integers and Fibonacci series.	3	- L2 - L3	L3	-Develop -	- Lecture -	- Q&A -Assignment
5	Structure-Definition, declaration of structures, Initialization, structure within structure, array of structures, pointer to structures.	4	- L2 - L3	L3	-Develop -	- Lecture -	- Q&A -Assignment
5	Pointers-Definition, declaration of pointers, Initialization of pointers, Accessing a variable, Array of pointers, pointers and structures, void pointers, sample programs Preprocessor Directives- macro substitution, inclusion.	4	- L2 - L3	L3	-Develop -	- Lecture - -	- Q&A -Assignment

2. Concepts and Outcomes:

Table 1: Concept to Outcome – Example Course

Module-#	Learning or Outcome from study of the Content or Syllabus	Identified Concepts from Content	Final Concept	Concept Justification (What all Learning Happened from the study of Content / Syllabus. A short word for learning or outcome)	CO Components (1.Action Verb, 2.Knowledge, 3.Condition / Methodology, 4.Benchmark)	Course Outcome **Student Should be able to ...**
A	*I*	*J*	*K*	*L*	*M*	*N*
1	- Study of computer generations. - Study of computer types. - Study of memory.	- Internal architecture -	Computer Architecture	Understand Internal Architecture of Computer.	- Understand - Working - Computer System -	Understand the working of Computer System.
1	-Study of structure of C program. -Data types, Variables, Operators	-C Programming structure -	Program structure	Understand the syntax and semantics C programming.	- Understand -Variables & Operators - C program	Understand the procedure to write a C program and usage of Variables & Operators
2	-Study of formatted input output functions. -	-input and output functions	Standard Input & Output library	Understand the read and write on to the console.	- Understand - read and write - Input & Output library functions	Understand to read and write the data using Input & Output library functions
2	-Study of if, if-else, nested if-else -Study while, for, do-while	- Branching & Looping -	Program constructs	Understand the branching and repetition statements.	- Understand - Branching & Looping constructs - C program	Understand to construct a programming solution to a given problem using Branching & Looping constructs
3	-Study of 1D & 2D declaration, initialization of an arrays.	-Arrays in C program -	Structured data representation	Describe the storing the data in the memory.	- Understand - linear representation of data - arrays	Understand the linear representation of data using arrays
3	-Study of Binary search -Study of	- Searching -Sorting	data arrangement & probing	Develop the searching and sorting	- Develop - data arrangement & probing	Develop Algorithms for data arrangement &

	Bubble sort, Selection sort			techniques.	- Searching & Sorting technique	probing using Searching & Sorting technique
4	-Study of function declaration & function prototype. -	-C User-defined functions -	Modular programming	Understand the re-usability in C programming.	- Understand - Modular representation - User-Defined functions	Understand Modular representation of program using User-Defined functions
4	-Study of Fibonacci series, Factorial of a given number -	-Iterative function -	Recursion	Develop the Iterative solution.	- Develop - Recursion - C program	Develop a C program using Recursion
5	-Study of heterogeneous datatype. -	-C Structures -	User-defined datatype	Develop the storing complicated data	- Develop - to store the data - structures	Develop a C program to store the data of different types using structures
5	-Study of representing and manipulation address in the memory.	-Pointers in C	Memory representation	Develop the access and manipulate data in memory.	- Develop - Pointers - C program	Develop a C program to store the address of a variable using Pointers.