GRAPHIC ERA (DEEMED TO BE UNIVERSITY), DEHRADUN

SEMESTER I

Name of Department: - Computer Science and Engineering

1. Subject Code: **TCS- TCS 101** Course Title: **Fundamental of computer and Introduction to Programming**
2. Contact Hours: **L:** 3 **T**: 0 **P**: 0
3. Examination Duration (Hrs.): **Theory** 3 **Practical** 0
4. Relative Weight: **CIE** 25 **MSE** 25 **ESE** 50
5. Credits: 3
6. Semester: I
7. Category of Course: DSC
8. Pre-requisite: Basic Knowledge of Mathematics

9.**Course Outcome:**	CO1: Learn the concepts of IT and understand the fundamentals of basic building blocks of computer science. CO2: Understand basic data types and syntax of C programming. CO3: Propose solution to problem by using tools like algorithm and flowcharts. CO4: Analyze and select the best possible solution for decision-based problems using decision making skills and develop the aptitude to solve iterative problems using different types of looping statements. CO5: Implement complex problems as a collection of sub problems by applying modularization in applications using functions. CO6: Apply and implement the concept arrays for providing solution to homogenous collection of data types.

10. **Details of the Course:**

Sl. No.	Contents	Contact Hours
1	**UNIT- I** Generation of computers, Computer system memory hierarchy, Input/Output, RAM/ROM, Software & Hardware, Understand bit, byte, KB, MB, GB and their relations to each other, Operating System overview, Computer Networks Overview Algorithms and Flow Charts – Examples of Flow charts for loops and conditional statements	**8**
2	**UNIT- 2** First C program - Hello world, How to open a command prompt on Windows or Linux. How to read and print on screen - printf(),scanf(),getchar(), putchar() Variables and Data types - Variables, Identifiers, data types and sizes, type conversions, difference between declaration and definition of a variable, Constants Life of a C program (Preprocessing, Compilation, Assembly, Linking, Loading, Execution), Compiling from the command line, Macros, Operators – equality and assignment, Compound assignment operators, Increment and decrement operators, Performance comparison between pre and post increment/decrement operators, bitwise operators, Logical Operators, comma operator, precedence and associativity.	**10**
3	**UNIT- III** Conditional statements: if statement, if-else statement, ternary statement or ternary operator, nested if-else statement, switch statement, Difference between performance of if else and switch, Advantages of if else and switch over each other Loops: ‘for’ loops, ‘while’ loops, ‘do while’ loops, entry control and exit control, break and continue, nested loops	**8**

4	**UNIT- IV** Functions: Function prototype, function return type, signature of a function, function arguments, call by value, Function call stack, Recursion v/s Iteration, passing arrays to functions, Storage classes: Automatic, Static, Register, External, Static and Dynamic linking implementation, C program memory (show different areas of C program memory and where different type of variables are stored), scope rules.	**9**
5	**UNIT- V** **Arrays:** Single-dimensional arrays, initializing arrays, computing address of an element in array, character arrays, segmentation fault, bound checking, Searching and Sorting.	**10**
	Total	**45**

Text Books:

Authors Name	Title	Edition	Publisher, Country	Year
Peter Prinz, Tony Crawford	C in a Nutshell	1st	O,Reilly Publishers,USA	2011
Peter Norton	Introduction to computers	6th	TMH Publication, India	2009
E.Balagurusamy	Programming in ANSI C	6th	McGraw Hill Education, American	2015

Reference Books:

Authors Name	Title	Edition	Publisher, Country	Year
Steve Oualline	Practical C programming	**3rd**	O,Reilly Publishers,USA	**2011**
Brian W Kernighan, Dennis M Ritcie	"The C Programming Language	**2nd**	Prentice Hall, India	**2000**
Yashwant Kanetkar	Let Us C	**8th**	BPB Publication, India	**2007**

Course Articulation Matrix

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
TCS101.1	Learn the concepts of IT and understand the fundamentals of basic building blocks of computer science.	1	2				2			1		1	3	2	1	1
TCS101.2	Understand basic data types and syntax of C programming	1					2			1			1	2	1	1
TCS101.3	Propose solution to problem by using tools like algorithm and flowcharts.	3				2							2	3	2	1
TCS101.4	Analyze and select the best possible solution for decision-based problems using decision making skills and develop the aptitude to solve iterative problems using different types of looping statements.	3	2	2								2	2	3	2	2
TCS101.5	Implement complex problems as a collection of sub problems by applying modularization in applications using functions.				3		2					2	2	3	2	2
TCS101.6	Apply and implement the concept arrays for providing solution to homogenous collection of data types.		2									1	2	3	2	2
TCS101		2.00	2.00	2.00	3.00	2.00	2.00	-	-	1.00	-	1.50	2.00	2.67	1.67	1.50

High correlation (3); Medium correlation (2); Low correlation (1), No correlation (-)

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SEMESTER II

Name of Department: - Computer Science and Engineering

1. Subject Code: **TCS201** Course Title: **Programming for Problem Solving**
2. Contact Hours: **L:** **3** **T**: **0** **P**: **0**
3. Examination Duration (Hrs): **Theory** **3** **Practical** **0**
4. Relative Weight: **CIE** **25** **MSE** **25** **ESE** **50**
5. Credits: **3**
6. Semester: **II**
7. Category of Course: **DSC**
8. Pre-requisite: TCS 332 Fundamental of Information Security and Blockchain.

9. **Course Outcome:**	After completion of the course the students will be able to**:** CO1: Learn and apply concepts of strings and multi-dimensional array for providing solutions to homogenous collection of data types CO2: Propose solution to problem by using tools like algorithm and flowcharts. CO3: Apply the concept of pointers to optimize memory management by overcoming the limitations of arrays. CO4: Process and analyze problems based on heterogeneous collection of data using structures. CO5: Apply concepts of file handling to implement data storage and retrieval tasks. CO6: Implement the basic real life problems using python

10. **Details of the Course:**

Sl. No.	Contents	Contact Hours
1	**UNIT- I** Multi-Dimensional Arrays- Initializing arrays , row major and column major form of an array, character strings and arrays, Strings – Declaration of strings, Initialization of strings using arrays and pointers, Standard library functions of string.	**7**
2	**UNIT- 2** Pointers –Basic of pointers and addresses, Pointers and arrays, Pointer arithmetic, passing pointers to functions, call by reference. Accessing string through pointers. Dynamic memory management in C - malloc(), calloc(), realloc(), free(), memory leak,Dangling, Void, Null and Wild pointers Structures - Structures, array of structures, structure within structure, union, typedef, self-referential structure, pointer to structure	**10**
3	**UNIT- III** **File Handling** - Opening or creating a file, closing a file, File modes, Reading and writing a text file using getc(), putc(), fprintf() ,fscanf(),fgets(), fputs(), Reading and writing in a binary file, counting lines in a text file, Search in a text file, Random file accessing methods- feof(), fseek(), ftell() and rewind() functions.	**8**
4	**UNIT- IV** **Introduction to Python-** History of Python, Need of Python Programming, Python features, First Python Program, Running python Scripts, Variables, Reserved words, Lines and indentation, Quotations, Comments, Input output. Data Types, Operators and Expressions: Standard Data Types – Numbers, strings, Boolean, Operators – Arithmetic Operators, comparison Operators, assignment Operators, logical Operators, Bitwise Operators.	**10**
5	**UNIT- V**	**10**

	Control flow – if, if-elif-else, for, while, break, continue, pass, range(), nested loops. Functions – Handling functions in Python File Handling – Reading text file, writing text file, copying one file to another	
	Total	**45**

Text Books:

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Peter Prinz, Tony Crawford	C in a Nutshell	**1st**	O'Reilly,United Kingdom	2011
Yashwant Kanetkar	Let Us C	**8th**	BPB Publication,India	2007

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Course Articulation Matrix

CO	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
TCS201.1	Learn and apply concepts of strings and multi-dimensional array for providing solutions to homogenous collection of data types	1	2	1									1	3	2	1
TCS201.2	Propose solution to problem by using tools like algorithm and flowcharts	3				2								3	2	2
TCS201.3	Apply the concept of pointers to optimize memory management by overcoming the limitations of arrays.			2										3	2	1
TCS201.4	Process and analyze problems based on heterogeneous collection of data using structures.		3									1		3	2	1
TCS201.5	Apply concepts of file handling to implement data storage and retrieval tasks.			3		1								3	2	2
TCS201.6	Implement the basic real life problems using python.				3					2		2		3	2	2
TCS201		2.00	2.50	2.00	3.00	1.50	-	-	-	2.00	-	1.50	1.00	3.00	2.00	1.50

High correlation (3); Medium correlation (2); Low correlation (1), No correlation (-)