



Course Syllabus  
Gyanmanjari Diploma Engineering  
Semester-1 (Diploma)

**Subject:** Basic Computer Programming-DETCE11201

**Type of course:** Major (Core)

**Prerequisite:** Programming fundamental, logic and problem-solving skill, mathematical logic

**Rationale:** The present era can be said a digital era. Nowadays almost in every walk of life there is application of digitization, atomization as well as connecting various gadgets, home appliances, human body etc. to each other. The core component which drives these tasks is a piece of code for the machine, known as a program. It is essential for the students to learn basic concepts and methodology to develop computer programs. This first and introductory level Computer Programming Course is intended to develop logical thinking skills and programs using a popular structured programming language 'C'. The programming skills thus acquired can be used for developing programs for the scientific, research and business purposes.

**Teaching and Examination Scheme:**

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P		C	Theory Marks		Practical Marks		
			ESE		MSE	V	P	ALA	
4	0	2	5	60	30	10	20	30	150

*Legends: CI-Class Room Instructions; T- Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.*



**Continuous Assessment:**

(For each activity maximum-minimum range is 5 to 10 marks)

Sr. No	Active Learning Activities	Marks
1	<b>Sketch noting</b> The students will be given the questions by faculty for which they have to draw flowchart and write algorithm and they have to submit it on the Moodle.	10
2	<b>Think-Pair-Repair</b> A practical problem will be shared to the students by the faculty, which they have to implement and find the appropriate solution and they have to share the solution on the Moodle. (Group of 3 students)	10
3	<b>Assignment</b> Some tricky theoretical and practical question will be given to the students. The answers of the assignment questions have to be shared on Moodle. Per unit maximum 3 questions will be allocated to the students.	5
4	<b>MCQ</b> A list of MCQ questions will be given to the students for which they have to select the correct answer and submit on the Moodle. Per unit maximum 5 questions will be allocated to the students.	5
Total		30

**Course Content:**

Sr. No	Course content	Hrs.	% Weightage
1	<b>Flowchart and Algorithm:</b> Introduction to Programming languages, Types of Programming language. Problem solving methods: Flowchart and Algorithm, Introduction to flowchart, Introduction to algorithm, developing and writing a pseudo code.	8	15
2	<b>Basics of 'C': Structure of C program:</b> Introduction to C language, History of C, Features of C, Structure of C program, Character set, Tokens, Keywords, Identifiers, Data-types, Variables, Dynamic Initialization of variable, Constant and Volatile variable, Operators, Operator precedence and associativity, Type conversion: Implicit and Explicit, Input/Output, Formatted Input/output.	10	15



3	<b>Decision Statements and Loop Control Statements:</b> Introduction, simple if statements, if-else statements, nested if-else statements, if else-if ladder, switch case statements, Use of ternary (?:) operator, go to statements, for loop, while loop, do-while loop, Break and Continue statements.	12	25
4	<b>Array and Pointers:</b> Introduction, One dimensional array, two-dimensional array, multi-dimensional array, Introduction to string, Introduction to pointer, characteristics of Pointer, Declaration of pointers, types of pointers, Pointer to pointer	10	17
5	<b>Functions:</b> Introduction to function, characteristics of function, Types of function, Advantages of function, Working with function, Declaring, Defining and calling of function, Categories of user defined functions, call by value, call by reference, Difference between call by value and call by reference, recursive function, Built in Functions, Storage classes: Auto, extern, static and register.	12	20
6	<b>Structure, Union and Files:</b> User defined data types: enum, typedef, Introduction to structures, syntax of structures, Declaration, initialization and accessing of structures, Array of structures, Introduction to Union, Syntax of Union, Declaration, initialization and accessing of Union, Introduction to files, Working with files	8	18

**Suggested Specification table with Marks (Theory):60**

.Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage %	20	35	35	10	-	-

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

**Course Outcome:**

After learning the course the students should be able to:	
CO1	Design algorithm and flowchart for the given Problem.
CO2	Develop C programs using control structures.
CO3	Develop C programs using arrays and pointers.
CO4	Implement user defined functions.
CO5	Use structure and union in C programs.
CO6	Implement file and I/O operations in C.



**List of Practical****(Minimum-10 practical):**

Sr. No	Descriptions	Unit No	Hrs
1	Design and test sample C programs to display a message on screen.	2	1
2	Design and test minimum 3 C programs using constants, variables and data-types.	2	2
3	Design and test a C program to swap 2 numbers using a third variable and without using a third variable	2	1
4	Design and test a C program to compute volume and surface area of a sphere.	2	1
5	Design and test a C program to convert temperature in Fahrenheit to Celsius and vice versa.	2	1
6	Design and test C programs to using enlisted operators: (1) Assignment (2) Arithmetic (3) Relational (4) Logical	2	2
7	Design and test at least 5 C programs using the enlisted operators: (1) Bitwise (2) Increment and Decrement (3) Conditional (4) Comma (5) size of	2	2
8	Design and test at least 2 C programs using decision making statements: (1) Simple if (2) if...else (3) Nested if (4) if...else ladder (5) switch (6) goto	3	2
9	Design and test at least 3 C programs using (1) for loop (2) while loop (3) do...while loop	3	2
10	Design and test a C program using break and continue statements	3	1
11	Design and test at least 5 pattern programs using loop structures	3	2
12	Design and test at least 5 C programs using (1) one dimensional array (2) two dimensional arrays.	4	2
13	Design and test at least 3 C programs using strings.	4	2
14	Design and test at least 3 C programs using pointers.	4	2
15	Design and test a C program using the concept of pointer to pointer.	4	1
16	Design and test at least 5 C programs using user defined functions	5	2
17	Design and test at least 3 C programs by applying the recursion concept.	5	2
18	Design and test a C program to test various inbuilt string functions.	5	1
19	Design and test a C program to demonstrate various inbuilt math functions	5	1
20	Design and test a C program to demonstrate storage classes	5	1
21	Design and test a C program to demonstrate usage of enum and typedef.	6	1



22	Design and test at least 3 C programs on structures and unions.	6	1
23	Design and test at least 2 C programs using file operations	6	1
		Total	34

### Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

### Reference Books:

[1] Programming with ANSI and Turbo C By Ashok N. Kamthane, Pearson Education, New Delhi; ISBN: 978-8131704370

[2] Programming in ANSI C By E. Balagurusamy, McGraw Hills Education, New Delhi; 2019; ISBN: 978-9351343202

[3] Let us 'C' By Yashavant Kanetkar, BPB Publication, New Delhi; 2020; ISBN: 978-9389845686

[4] Introduction to C Programming By Reema Thareja, Oxford University Press, New Delhi; 2018; ISBN: 978-0199492282

