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Computer Programming Using C — Complete Syllabus

BTEUP Diploma in Computer Science & Engineering • 3rd Semester • Session 2026-27
Subject 3.7 (Practicum) • Total 100 Marks • 3 Credits • L 1 - P 4

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
3.7	Computer Programming Using C	Practicum	1 - 4	3	Practical 60	Practical 40 (3 hrs)	100
C Programming Total				3	60	40	100

What This Subject Aims To Do

To enable students to develop structured solutions to problems and implement them using computers — first formulating a solution as a well-defined sequence of actions, then expressing it in a programming language. By the end you should be able to: demonstrate knowledge of C programming concepts; develop simple programs using basic constructs; develop programs using conditional and looping concepts; understand multi-dimensional arrays and strings; and design modular C programs with reusable functions and pointers for better readability and maintainability.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Introduction to Problem Solving	2	20%

2	Operators & Expression	3	20%
3	Conditional & Looping Statements	3	20%
4	Arrays & String	3	20%
5	Function & Pointer	3	20%

Unit 1 — Introduction to Problem Solving (2 Periods, 20%)

Topics: Computational way of thinking; flowchart and algorithm; variable, constant and representation; data types; keywords; identifier.

In simple words: Before writing code, learn to think step by step: break a problem into actions, draw it as a flowchart, and name your data properly.

Unit 2 — Operators & Expression (3 Periods, 20%)

Topics: Arithmetic, relational, logical and bitwise operators; input and output; expressions; data type casting.

In simple words: The symbols that do the work in a program — maths, comparisons, logic — and how values change type.

Unit 3 — Conditional & Looping Statements (3 Periods, 20%)

Topics: if, if-else, if-else ladder, switch-case, break and continue; loops — for, while, do-while and nested loops.

In simple words: How a program makes decisions and repeats work: the two ideas behind almost every program you will ever write.

Unit 4 — Arrays & String (3 Periods, 20%)

Topics: Introduction to arrays; array declaration; length of array; manipulating array elements; single and multi-dimensional arrays; arrays of characters; introduction to strings; string declaration and definition; string functions (strlen, strcpy, strcmp).

In simple words: How to store many values together — lists, tables (matrices) and text — and the ready-made functions for handling strings.

Unit 5 — Function & Pointer (3 Periods, 20%)

Topics: Introduction to functions; global and local variables; function declaration, call and return; types of functions; standard functions; introduction to pointers; parameters and parameter passing; call by value / reference; recursive function; I/O and formatting.

In simple words: How to split a big program into small reusable pieces, and pointers — the concept that lets a function change data outside itself, and that every later language builds on.

Practical Work

- Installation of a C compiler; familiarisation with the programming environment and its options/menus.
- Draw a flowchart using MS Word or any other editor / online tool (e.g. Draw.io).
- Programs using I/O statements and various operators: print your name; arithmetic and logical operators; swap two numbers with and without a third variable.
- Programs using expression evaluation and precedence: unary and ternary operators; post- and pre-increment operators.
- Programs using decision making and branching: odd/even check; prime number check; largest of three numbers.
- Programs using loops: factorial; table of a number; prime numbers from 1 to 100; Fibonacci series up to n; different star patterns.
- Programs using n-dimensional arrays: print a 3×3 matrix; transpose of a 3×3 matrix; addition of two matrices.
- Programs using string functions: length of a string; concatenation of two strings; palindrome check for a string/number.
- Programs using parameter passing: user-defined function to add two numbers; call by value; call by reference.
- Programs using recursion: factorial using recursion.
- Programs using pointers: print the address of a variable using a pointer; swap the contents of two variables using a pointer.

Reference Books (as listed in the syllabus)

- Let Us C — Yashavant Kanetkar
- Problem Solving and Programming in C — R. S. Salaria, Khanna Publishing House
- C Programming: Absolute Beginner's Guide — Dean Miller & Greg Perry
- The C Programming Language — Kernighan & Ritchie, Prentice Hall of India
- Programming in ANSI C — E. Balagurusamy, Tata McGraw-Hill
- C Programming & Data Structures — B. A. Forouzan & R. F. Gilberg, CENGAGE Learning
- Outline of Programming with C — Byron Gottfried, Schaum, McGraw-Hill

Source: BTEUP 2nd Year curriculum (folder2627), approved in C.D.C. meeting held on 16.07.2026. Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text.

Please confirm with your own polytechnic for any local changes.

