



Programming Fundamentals for Engineers 0702113

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Course Outline and Policy

Objectives & Intended Learning Outcomes: Students should be able to:

- Understand and Analyze a problem statement and then develop an algorithm to solve the problem under consideration, using program development techniques (flow-charting, algorithms and pseudo-code);
- Understand the concepts of Structured & Procedural Programming;
- Code the program in C language, test it using proper data, debug it (fix errors if any), and document it;
- Understand basic Object Oriented Programming concepts and their implementations in C++;
- Use charting tools including MS Visio & UML for C++.

Course Contents:

- **Reviewing C Fundamentals:** Writing simple programs, compiling, debugging, and linking.
- **Problem Solving:** Flowcharting, Basic Algorithms, & Pseudo Coding;
- **Formatted Input / Output:** printf, and scanf.
- **Basic Types & Expressions:** Arithmetic operators, assignment operators, increments and decrements, evaluations.
- **Selection Statements:** One-way, Two Way, & Multiple-Way selections (Boolean values, if statement, else, switch, and break statements).
- **Loops:** while, do loop, for loop, exiting from a loop.
- **Arrays:** one-dimensional arrays, and multi-dimensional arrays
- **Functions:** calling, declarations, arguments, termination, and recursive functions.
- **Program Organization:** local and global variables, blocks, scopes.
- **Pointers.**
- **Pointers and Arrays.**
- **Strings:** Literals, string variables, reading and writing strings, C String library, arrays of strings.
- **Structures:** Introduction, struct.
- **Files** (If time allows).
- **Introduction to OOP:** Classes, objects, attributes, constructors, destructors, properties, methods, other OOP concepts.

Important Notes:

- Don't miss lectures, and be on time.
- Homework should be expected at the end of each lecture in soft and hard copies.
- A quiz should be predicted each lecture.
- Honor Code: Don't ever share code with others!

Assessments:

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| • Term 1 | 20% |
| • Term 2 | 20% |
| • Laboratory, Assignments, Quizzes, & Project | 20% |
| • Final | 40% |

Online Material & Contact Info:

- **Course website:** www.e4t.net/c
- **Email:** c-prog@e4t.net

References:

- C Programming: A Modern Approach, K. N. King, Georgia State University, ISBN 0-393-96945-2.
- C How to Program, Paul Deitel (Author), Harvey M. Deitel, Prentice Hall; 6th Edition, 2009, ISBN: 0136123562.
- Programming in C, A Complete Introduction to the C Programming Language, 3rd Edition, Stephen Kochan, ISBN 978-0672326660.
- Problem Solving Using C: Structured Programming Techniques, Uckan, Yuksel, McGraw-Hill, ISBN 0075619369.