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## Module [101]

# Fundamentals of C Programming

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### Module Overview

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This module will get you started developing in C language. The reading assignments will make sure that you get a basic introduction to C syntax and review elementary program design techniques which you already covered in your previous programming courses.

In addition to this, our focus will be to get you used to the various tools we will be using as well as teach you to make sense of the most common compiler errors you will encounter. Compiler errors are often difficult to interpret by novice programmers. That's something on which we'll work on during the entire offering. As a starter, we will make sure that, for each construct introduced in this first module, you have a good exposure to the most novice errors associated with it.

As usual, our learning activities will be divided in two groups. The "discovery week" will focus on the reading assignments and understanding the main Concepts. The "apply week" will help you put this newly acquired knowledge into practice and evaluate your understanding of the entire module through graded assessments. Refer to the Syllabus for more details.

## Learning Outcomes

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By the end of this module, you will gain the following knowledge:

### Programming Concepts

- What is a syntactical error vs. linkage error vs. Runtime error vs. Logical error?
- Program Design Strategies
- Compilers and their multi-steps processes
- Precedence of Arithmetic Operators
- Logical operators and conditional expressions

### Designing Programs

- Basic problem-solving techniques
- Top down stepwise refinement technique
- Using Conditional Statements
- Using Iterative Statements
- Counter-controlled and sentinel-controlled repetition

### Implementing Programs (in C)

- Using GCC compiler
- Elementary syntactical elements of C (comments, precompilation directive, keywords, standard C library functions)
- Increment / Decrement Operators
- If / else statement
- While statement
- For and do...while statements
- Break / continue statements
- Input / Output Statements
- Fundamental Data Types in C
- Arithmetic Operators in C
- Precedence of Arithmetic Operators in C

### Troubleshooting

- Common errors related to the above C statements
- Off by one loop errors
- Difference between assignments and equality comparisons in C (= vs. ==)
- Consequences of using an assignment instead of an equality comparison in a condition