The C Programming Language

Hands-on course of 5 days - 35h
Ref.: LGC - Price 2024: CHF2 970 (excl. taxes)

HANDS-ON WORK
A Personal Computer with UNIX or Windows is available for each participant to immediately apply the new concepts.

THE PROGRAMME
last updated: 01/2018

1) Introduction to UNIX and C programing
- Introduction to C programing. History, the pre-processor, the compiler, the linker and the loader.
- Tracing tools, debugger, profilers and indexing tools.
- C language structure. The basic syntax. First program using printf (hello world).
- The main function. comments. Reserved keywords.
- The C preprocessor. Including headers. Macros and conditional compilation.
- Macros with variable numbers of arguments.

2) Basic C components and types
- Basic language components. C types, sizeof, cast. Assigning a value.
- Pointers and strings. Incomplete types.
- Formatted Input Output. Using printf and scanf to write to the screen and read from keyboard. Escape sequences.
- Arithmetic and logic. Arithmetic, bitwise, logical and Floating point operators.
- Compound assignment operators.

3) Flow control
- Selection statements : if/else and switch.
- iteration statements : for, while, do/while
- jump statements : goto, labels, label addressing. Continue and break statements.

4) Storage classes
- Storage classes : auto, static, extern, register.
- Storage qualifiers : volatile, const, restrict.
- Pointers et arrays : initialization of pointers and arrays. Multidimensional arrays.

5) C functions
- Function declarations. Argument passing. return directive.
- Scope of the variables. Function pointers.
- Declaring function prototypes.
- Advanced C function programing. Inline function tag. Nested functions. Variable number of arguments.

6) User defined types
- Structures definition. Initialization of structures.
- Accessing a structure members. Accessing a structure members with a pointer.
- Definition of unions. initialization of unions.
- Accessing a union members. Accessing a union members with a pointer.

TRAINER QUALIFICATIONS
The experts leading the training are specialists in the covered subjects. They have been approved by our instructional teams for both their professional knowledge and their teaching ability, for each course they teach. They have at least five to ten years of experience in their field and hold (or have held) decision-making positions in companies.

ASSESSMENT TERMS
The trainer evaluates each participant's academic progress throughout the training using multiple choice, scenarios, hands-on work and more.
Participants also complete a placement test before and after the course to measure the skills they've developed.

TEACHING AIDS AND TECHNICAL RESOURCES
• The main teaching aids and instructional methods used in the training are audiovisual aids, documentation and course material, hands-on application exercises and corrected exercises for practical training courses, case studies and coverage of real cases for training seminars.
• At the end of each course or seminar, ORSYS provides participants with a course evaluation questionnaire that is analysed by our instructional teams.
• A check-in sheet for each half-day of attendance is provided at the end of the training, along with a course completion certificate if the trainee attended the entire session.

TERMS AND DEADLINES
Registration must be completed 24 hours before the start of the training.

ACCESSIBILITY FOR PEOPLE WITH DISABILITIES
Do you need special accessibility accommodations? Contact Mrs. Fosse, Disability Manager, at psh-accueil@ORSYS.fr to review your request and its feasibility.

7) The standard C library

- The strings library functions. Signal, raise, kill are used to send or receive signals.
- C library propose a standard interface for file I/O.
- Buffered file access, formatted and unformatted I/O. Constants and variables.
- Non local goto. Using setjmp and longjmp with signals.
- Handling errors : errno, stderr and perror
.
- Security issues. Buffer overflows vulnerabilities. Threading problems and race conditions

DATES

REMOTE CLASS
2025 : 17 Feb, 02 Jun, 08 Sep, 17 Nov