

E301B C Programming

Competencies List

This document provides the list of basic and advanced competencies, with a precise description, that can be acquired through the *E301B C Programming* activity.

Basic Competencies

Basic competencies are specific to a teaching unit or activity and a 100% mastery level for all of them is required to succeed the teaching unit or activity (10/20).

Code	The learner is able to...
Programming	
CP001	correctly use the syntax of C programming.
CP002	use pointers and the address (&) and dereference (*) operators.
CP003	use procedures and functions from the C standard library given their specification.
Using GCC	
CP101	write, compile and execute a single source file C program with the command line.
CP102	understand and use the <code>#include</code> and <code>#define</code> (for constants) preprocessor directives.
Memory representation and structure	
CP201	understand and compare different ways to represent integer and real numbers and how operations are made.
CP202	understand how memory is organised to support the execution of a program.
Code architecture and quality	
CP301	define prototypes for procedure and function and structure the code to use them.
CP302	handle rigorously the errors when calling procedure and function.
Debugging	
CP401	understand basic GCC compiler errors and warnings and fix the code accordingly.
CP402	understand what are stack and buffer overflow, identify and fix such bugs.

Advanced Competencies

Advanced competencies could be transversal to several teaching units or activities and increasing the mastery level of any of them is global to all the teaching units and activities where it is declared.

Code	The learner is able to...
Programming	
CP004	define and manipulate structures and define a new type with <code>typedef</code> .
CP005	read and write text and binary files.
Using GCC	
CP103	define and use macros with the <code>#define</code> preprocessor directive.
CP104	compile several object files and link them together to get an executable file.
Memory representation and structure	
CP203	understand the relation between arrays and pointers concepts and notation equivalence.
CP204	define and use a list implemented by a chained structure with C.
Code architecture and quality	
CP303	define header files and implement them.
CP304	write a code without any warnings when compiling with <code>-Wall</code> .
GP301	write robust code with good error management.