ECAM
BRUSSELS ENGINEERING SCHOOL

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I5020 Computer Security

Competencies List

This document provides the list of basic and advanced competencies, with a precise description, that can be acquired through the *I5020 Computer Security* course.

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...
Computer Security Principle	
CS001	understand the CIA triad and use it to explain the key objectives of computer security.
CS002	define and explain the basic security concepts and the relations between them.
CS003	identify weaknesses in a computer system or infrastructure and propose solutions.
Cryptography	
CS101	make connections between cryptographic tools and the CIA triad.
CS102	compare symmetric and asymmetric encryption schemes.
CS103	write a program that encrypts data with the suitable libraries.
Secured Design	
CS201	understand software protections that can be installed on a computer system.
CS202	discuss about the differences and importance of authentication and access control.
CS203	identify security risks related to operating systems, network, database, cloud and IoT and propose solutions to decrease them.
Secured Programming	
CS301	write robust code that checks precisely all the external data (environment, file, form...).
CS302	write robust code that resists to SQL, PHP injections and XSS attack.
GP301	write robust code with good error management.
Security Audit	
CS401	identify vulnerabilities in a system and propose countermeasures for them.
CS402	capture network traffic with WireShark to perform basic analyses.
CS403	discuss about the risks that a company assets are exposed to and propose solutions to decrease them.

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...
Computer Security Principle	
CS004	make links between attacks and threat consequences with the CIA triad.
CS005	identify residual risks that come from a countermeasure.
Cryptography	
CS104	encrypt and decrypt messages with “historical” ciphers.
CS105	describe formally a given cryptosystem and manually encryt/decrypt messages formally.
CS106	identify the suitable cryptographic tool for a given security issue.
Secured Design	
CS204	discuss about general design principles for protection mechanisms.
CS205	write an application that stores passwords securely.
CS206	explain techniques that can be used to protect a system against malware.
Secured Programming	
CS303	apply code design principles in developed software.
CS304	program, configure and launch a secured HTTPS server.
Security Audit	
CS404	perform a basic external security audit of a website with open source tools.
CS405	analyse a news article about a computer security problem with a security model.
CS406	perform an advanced audit of a website with an open source linux distribution.