lsinc1102

2025

Computer Hardware Principles

UCLouvain

The version you're consulting is not final. This course description may change. The final version will be published on 1st June.

5.00 credits	30.0 h + 30.0 h	Q2

⊗ **This learning unit is not open to incoming exchange students!**

Teacher(s)	Bonaventure Olivier ;
Language :	French
Place of the course	Charleroi
Main themes	The course aims to introduce students to the operating principles of computers to enable them to understand how their programs are executed on a simple computer. • Representation of information in binary form (integer and real numbers, characters, etc.) • Combinatorial logic (logic gates, construction of simple circuits) • Memory management (RAM, ROM, …) • Synchronous digital circuits and role of the clock • Construction of a simple microprocessor • Inputs-Outputs and storage devices • assembly language
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 • Describe the main components of a computer and their role • Explain how information and programs are represented in memory • Design a small logic circuit implementing a simple combinatorial function • Read and write simple assembly programs
Evaluation methods	First session The final grade is equally split: 50% for the "assembly part" 50% for the "electronics part". For the assembly part, the grade is calculated based on: • A written exam mid-semester • A continuous evaluation during lectures • Students obtaining 10/20 or more at the mid-semester exam will not have to do this part of the exam again. Others can redo this part in the end of the semester. The electronic part will be evaluated only with a final exam. Second session • Written exam only (the continuous evaluation does not count anymore), with 50% weight for each part. Bonus points are available for students actively participating in improving the pedagogical support. The use of generative AI tools is forbidden for redacting reports and generate source code in this course. Also, external information sources must be always cited, respecting bibiligraphical referencing norms.
Teaching methods	• Lecture • Exercise sessions • Mini-projects for building the main components of a computer
Content	• Representation of information in binary form (integer and real numbers, characters, etc.) • Combinatorial logic (logic gates, construction of simple circuits) • Memory management (RAM, ROM, …) • Synchronous digital circuits and role of the clock • Construction of a simple microprocessor • Inputs-Outputs and storage devices • assembly language

Inline resources	https://sites.uclouvain.be/LSINC1102/pfo/ https://moodle.uclouvain.be/course/view.php?id=4237 https://www.nand2tetris.org
Bibliography	The Elements of Computing Systems, By Noam Nisan and Shimon Schocken (MIT Press) Notes de cours, disponibles via https://sites.uclouvain.be/LSINC1102/pfo/
Faculty or entity in charge	SINC

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Computer Science	SINC1BA	5		🔍