linfo1140
2024

Electronic basics of computing

UCLouvain

| 5.00 credits | 30.0 h + 30.0 h | Q2 |

Teacher(s)	Andraud Martin (compensates Bonaventure Olivier) ;Bonaventure Olivier ;Van den Schrieck Virginie (compensates Bonaventure Olivier) ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	This course assumes that the ability to deal with simple problems via mathematical equations is acquired. This approach will be expanded here to problems related to electricity and electronics. Basic notions in physics (such as the existence of forces, the notion of energy) are also supposed to be known as taught in secondary school.
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	• Lectures • Exercices on the ingenious platform
Content	This course aims to introduce to students the working principles of computers, to allow them to understand how their programs are executed on simple computing machines. • Representing information in a binary form • Combinatorial logic • Memory • Digital circuits, role of clocking • Building a simple microprocessor • Assembly language

Inline resources	https://moodle.uclouvain.be/course/view.php?id=4333
Bibliography	The Elements of Computing Systems, Noam Nisan and Shimon Schocken (MIT Press) Notes du cours de Principes de fonctionnement des ordinateurs
Faculty or entity in charge	INFO

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Computer Science	SINF1BA	5		🔍