UCLouvain

linfo1140

2026

Principles of computer operation

5.00 credits	30.0 h + 30.0 h	Q2

Teacher(s)	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 :** • 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". **Assembly part** For the assembly part, the grade is calculated based on: • A written exam mid-semester • A continuous evaluation during lectures An INGInious test will be given mid-semester. This test will be similar to the final exam and will be exempting: students who have obtained more than 10/20 for the assembler part (combined permanent assessment and INGInious test) will be automatically exempted from the INGInious exam and will only take the “electronics” part in the exam session (see below). Students who are exempted following the INGInious test but who still wish to take the exam must submit a request by email to the professors before the end of the semester. If they retake the exam, the result of this test will be used for the final calculation. The grade for the exemption test will no longer be taken into account. **Electronic part** The electronic part will be evaluated only with a final exam. **Second session** Exam only : continuous assessment no longer counts in the second session. Each part of the course will be weighted at 50%. If one of the two parts (assembler or electronics) was passed in the first session (grade >=10/20), the student will automatically be exempt from the corresponding part. If they still wish to retake this part in the second session, they must submit a request by email to the professors before the start of the second session, and at least one week before the exam. If they retake this part of the exam, the result of the second session will be used for the final calculation. The June grade will no longer be taken into account. **Additional information** 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		🔍
Minor in Computer Sciences	MINSINF	5		🔍