Badji-Mokhtar University. Annaba
Faculty of Technology
Department of Computer Science

جـامـعـة بـاجـي مـخـتـار عـنـابـة
كـلـيـة التكنولوجيا
قسم العالم الآلي

SYLLABUS

Domain: Medical Sciences + Mathematics and Computer Science

Field: Medicine + Computer Science

Speciality: Medicine + Big Data

Semester: 1 **Year:** 2025-2026

Identification of the course

Title: Machine architecture (MAR)

Unit: UD1

Credit: 4 **Coefficient:** 2

Total weekly hourly volume: 1h30

- Lecture (number of hours per week): 1h30

- TD (number of hours per week):

- TP (number of hours per week):

Responsible for the course

Last Name, First Name, Grade: Khelifi Hakima, MCB

Email: khelifihakima22@yahoo.fr

Course Time and Location: Saturday 11:00-12:25 (online)

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Description of the course

Prerequisites: Elementary Mathematics

General Course Objective: The main objective of this course is to introduce the basic components of computer systems, including processors, memory, I/O devices, and storage.

Learning Objectives: Upon completion of this course, students will be able to:

- ✓ Understand the basic components of computer systems.
- ✓ Understand how data is represented in a computer system.
- ✓ Understand how logic gates are used to build digital circuits and how these circuits are represented and analyzed.

Content of the course

Chapter 1: General introduction
- Definitions.
- Architecture of a computer system.
- Machine language (binary code).
- Data storage units.
- Evolution of computers (history)

Chapter 2: Numbering systems
- Definition.
- System of base b (base 2, 8, 10 and 16)
- Conversions
- Fractional numbers conversion.
- Conversion from base p to base q.
- Binary addition and subtraction.

Chapter 3: Data representation
- Introduction
- Binary code (Natural, Gray, BCD)
- Data types
- Characters representation

Chapter 4: Boolean Algebra and Combinational circuits
- Definition
- Fundamental concepts: Boolean variable, Boolean function, Principle of duality
- Boolean postulates and theorems
- Truth table
- Logic gates
- Boolean operators and precedence
- Representation of Boolean Function
- Minimization of Boolean functions
- Design steps of a combinational circuit
- Study of some common combinational circuits: The half-adder, full adder…..

Assessment mode

Nature of the control	%
Exam	60
Continuous assessment	40
Total	**100%**

References and Bibliography

Title	Author	Publisher and year
Computer Organization and Design : The hardware/software interface, Morgan-Kaufmann (Fifth edition).	D A Patterson & J L Hennes	2013
Structured Computer Organization, Pearson (International edition).	A S Tanenbaum and T Austin,	2012
Computer Systems : A Programmer's Perspective, Pearson (Global edition).	R E Bryant & D R O'Hallaron,	2015
Computer Organization and Architecture 8TH EDITION	William Stallings. Prentice Hall,	2010

Course Schedule

Week	Course Title	Remark
1	General introduction	
2-3	Architecture of a computer system	
4	Machine language	
5	Numbering systems	
6	Conversions	
7	Binary addition and subtraction	
8-9	Binary code	
10	Data types	
11	Fundamental concepts: Boolean variable, Boolean function, Boolean postulates and theorems	
12	Truth table and Logic gates	
13-14	Design steps of a combinational circuit	

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List of students

N	First Name	Last Name	Email	Signature