

Course Syllabi

1. TICS-00053 COMPUTER ORGANIZATION AND ARCHITECTURE

2. 96 credits hours.

3. Bibliography

- Computer Organization and Design: the hardware/software interface, Patterson, David A., and John L. Hennessy, 2004

4. Specific Course Information

- a. This subject introduces the principles of computer organization and the basic concepts of architecture. The interaction between hardware and computer software is studied on various levels. Content includes logic and digital arithmetic, representation of data and instructions at machine level, and design of processors with emphasis on the organization of data and control paths. Topics on programming in assembly language, memory hierarchy, segmentation, and performance.
- b. Prerequisites:
 - TICS-00051 MICROPROCESSORS

5. Learning Objectives of the Course

- a. To know the basic principles about the organization and architecture of a computer with emphasis on the design of the processor, and the interaction between hardware and software on various levels.
 - To identify the components of a computer and its interconnections.
 - To recognize the design and basic components of the Central CPU Process Unit: the Arithmetic-Logic Unit ALU and the Control Unit.
 - To understand the representation of data and instructions at machine level.
 - To understand representation Numbers and arithmetic for computers.
 - Describe the functional organization of the data path and control of a processor and performance improvements.
 - Describe the organization and architecture of the memory system.
- b. Learning Outcomes
 - Perform simple programs using a set of instructions.
 - Distinguish the hierarchy of memory and its implications of reading and writing.
 - Identify the functioning of the basic components of the computer.
 - Know the features of a set of processor instructions.
 - Interprets the internal structure and function of the processor.
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 - Identify the functioning of the basic components of the computer.
 - Distinguish the hierarchy of memory and its implications of reading and writing.
 - Interprets the internal structure and function of the processor.
 - Know the features of a set of processor instructions.
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 - Distinguish the hierarchy of memory and its implications of reading and writing.

6. Course Topics

- Abstractions and technologies of computers
- Instructions: computer language
- Arithmetic for computers

- The processor
- Improved performance through segmentation
- Memory