

CC 312 – COMPUTER ORGANIZATION

CREDIT HOURS

3 Hours

CONTACT HOURS (Hours/week)

Lecture: 2; Tutorial: 2.

TEXT BOOK

Linda Null, Julia Lobur, “Computer Organization and Architecture ”, Jones & Bartlett Pub., latest edition.

COURSE DESCRIPTION

Computer interconnection structures - computer components - computer function interconnection structures - bus interconnection. - Internal and external memory - computer memory system overview - semiconductors main memory - cache memory - magnetic tape - optical memory - Input / Output - I/O modules - programmed I/O - interrupt-driven I/O - direct memory Access - Operating system - Operating systems overview – scheduling - memory management - The central processing unit - Computer Arithmetic - characteristics and functions of instruction sets - addressing modes - processor organization - the instruction cycle - instruction pipelining - Control unit Micro-operation - hardware implementation - Control Functions.

PREREQUISITE:

CC 216.

RELATION OF COURSE TO PROGRAM

Required

COURSE INSTRUCTION OUTCOMES

The student will be able to:

- Present the various digital components used in the organization and design of digital computers
- Explain the detailed steps that a designer must go through in order to design an elementary basic computer.
- Introduce the organization and architecture of the main units of a digital computer.

TOPICS COVERED

- Introduction to Computer Systems Organization & Architecture – part 1.
- Introduction to Computer Systems Organization & Architecture – part 2.
- Digital Components.
- Register Transfer Organization & Micro-operation – part 1.
- Register Transfer Organization & Micro-operation – part 2.
- Basic computer Organization and Design – part 1.
- Basic computer Organization and Design – part 2.
- Central Processing Unit – part 1.

- Central Processing Unit – part 2.
- Central Processing Unit – part 3.
- Memory Organization – part 1.
- Memory Organization – part 2.
- Memory Organization – part 3.
- Input-Output Organization – part 1.
- Input-Output Organization – part 2.

CONTRIBUTION OF COURSE TO MEET THE REQUIREMENTS OF CRITERION 5:

Professional component Content			
Math and Basic Sciences	Engineering Topics	General Education	Other
	✓		

RELATIONSHIP OF COURSE TO STUDENT OUTCOMES:

Student Outcomes		Course aspects
A	An ability to apply knowledge of mathematics, science, and engineering	a ₁ a ₂
B	An ability to design and conduct experiments, analyze and interpret data.	b ₁ b ₂ b ₃ b ₄
C	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economics, environmental, social, political, ethical, health, and safety, manufacturability, and sustainability	
D	An ability to function on multi-disciplinary teams.	
E	An ability to identify, formulate, and solve engineering problems	
F	An understanding of professional and ethical responsibility	
G	An ability to communicate effectively	
H	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and social content	
I	A recognition of the need for, and an ability to engage in life-long learning.	
J	A knowledge of contemporary issues within and outside the electrical engineering profession.	
k	An ability to use the techniques, skills, and modern engineering tools necessary for electrical engineering practice.	