# KENYA METHODIST UNIVERSITY (Nairobi Campus)

**Trimester:** May –August 2022

**Course:** Computer Organization and Architecture

BBIT 112/ CISY 201/DBIT 210/DCIS 105

**Credits:** 3

**Lecturer:** Grace W Mwangi.

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**Course Purpose**

The course introduces the design concepts in computer systems, which helps the student to understand the different design options and their implications to the performance of a computer system.

**Course Objective**

At the end of the course, the student should be able to:

* To appreciate the machine level system architecture
* To appreciate the conceptual building blocks and their interconnection structure
* To appreciate how the conceptual building blocks of the system architecture are organized.
* Identify current and future developments in computer architecture.

**Course Outline and Schedule:**

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| --- | --- | --- |
| **Week** | **Topics** | **Detail** |
| 1 & 2 | Introduction to Computer Architecture and Computer Organization | * Definition * Differences between Computer Architecture and Computer Organization * Computer hierarchy levels |
| 3$4 | System architecture | * Concept of a programmable machine * Instruction cycle * Interconnections structures |
| 5 | Memory subsystem | * organization and technology * RAM * ROM * Hierarchical memory organization |
| 6 | Input /Output sub-system | * I/O organization * I/O module organization and functions * I/O module addressing and configuration * I/O programming and control techniques |
| 7 | Secondary /Mass storage subsystem | * Hard disc organization * Operational overview * Performance factors * RAID technology |
| 8 | CPU internal architecture | * Classical organization |
| 9 & 10 | CPU instruction set architecture  CPU Performance enhancement | * CISC * RISC * Pipelined, superscalar, vector processing architecture |
| 11 | CPU Performance enhancement | * Array processor architectures * MIMD architectures: SMP, Cluster and NUMA |

**Mode of Delivery:**

* Lectures.
* Problem based learning.
* Group based learning.
* Independent studies.

**Course Assessment.**

* Continuous Assessment 30 %
* End of Trimester Examination. 70 %

**Core Reading Material**

* William Stallings, W.: *Computer Organization and Architecture: Design for performance*; Pearson Education Inc. 2010