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| **Course Code** | **Course Name** | Hours per Week | | | Total |
| **L** | **T** | **P** | Credits |
| CS3CO02 | Computer Architecture & Organization | 3 | 1 | 2 | 5 |

**Unit- I:**

Difference Between Computer Organization and Computer Architecture, Computer Types, Functional Units, Basic Operational Concepts: Bus Structures, Generation of computer, Introduction to computer operation with a simple 8bit -instruction computer illustrating assembly and machine language. Register Transfer language. Register Transfer Bus and memory transfers, Arithmetic Microoperations, logic micro operations, shift micro operations, Arithmetic logic shift unit.

**Unit-II:**

Instruction codes, Registers, Buses, Design of computer Instructions, Timing and control, Instruction Cycle, Memory-Reference Instructions, Input-Output Interrupt, Design of Basic Computer, Accumulator logic. Programming the basic Computer-Machine Language, Assembly Language, Assembler. Address Sequencing, Microprogram Instructions Format, Addressing Modes.

**Unit- III:**

Computer Arithmetic- Addition and Subtraction with signed magnitude, Multiplication and Division Algorithms, Divide Overflow Booth Multiplication Algorithm, Hardware implementation for signed -Magnitude and hardware algorithms.

**UNIT-IV:**

Input -Output Organization. Input-Output Interface, Synchronous vs Asynchronous Data Transfer, Modes of Transfer- Interrupt and its Priority, DMA. Memory Hierarchy- Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management Hardware.

**Unit-V**

Flynn’s Classification, RISC and CISC Processor, Pipelining and Vector Processing, Parallel Processing, Array processor, Multiprocessor Architectures Organization, Multi-core Architectures, Inter-processor Communication, System-on-Chips.

**Text Books:**

1. Computer System Architecture-M.Morris Mano- Pearson Education III Edition.
2. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, Computer Organization, McGraw-Hill.
3. William Stallings, Computer Organization and Architecture – Designing for Performance, Pearson Education.

**Problem and Assignments Book:**

1. Nicholas Carter and Raj Kamal, Computer Architecture and Organization, 2nd Edition, Schaum Outlines, Tata McGraw-Hill Ed., Second Edition.

**Reference Books:**

1. John P.Hayes, Computer Architecture and Organization, McGraw Hill, 3rd Edition.
2. David A.Patterson and John L.Hennessy, Computer Organization and Design: The hardware software interface, Morgan Kaufmann, 3rd Edition.

**Web Resources**

* <http://www.cs.mcgill.ca/~mhawke1/cs208/02a-ComputerStructureNotes.pdf>
* <http://www.stat.auckland.ac.nz/~dscott/782/Computers.pdf>
* www-csag.ucsd.edu/teaching/cse141-w00/lectures/Introduction.pdf –
* [www.cise.ufl.edu/~prabhat/Teaching/cda5155-su09/lecture.html](http://www.cise.ufl.edu/~prabhat/Teaching/cda5155-su09/lecture.html)
* www.ecl.incheon.ac.kr/courses/ca6/ca00.syllabus.pdf