MANIPAL UNIVERSITY JAIPUR

School of Computing and Information Technology

Department of Computer Science and Engineering
Course Hand-out

Computer Organisation and Architecture| CS 1301 | 4 Credits

Session: 2015-2016 | Faculty: Umashankar Rawat

Course Outcomes: At the end of the course, students will be able to

[1301.1]. Describe the interconnection between various functional units of a computer system and able to assess the performance of a computer.

[1301.2]. Describe various data representations and analyse the design of fast arithmetic circuits.

[1301.3]. Formulate assembly language programs for a given high level language construct and therefore develop employability skills.

[1301.4]. Describe various parts of a system memory hierarchy and caching techniques.

[1301.5]. Evaluate the performance of CPU, memory and I/O operations.

[1301.6]. Build the required skills to read and research the current literature in computer architecture.

A.   SYLLABUS

Basic Structure of computers: Computer types, functional units, basic operational concepts, bus structures, software, performance; **Machine Instructions and programs**: Numbers, arithmetic operations and characters, Memory locations and addresses; Memory operations, Addressing modes; **Arithmetic**: Addition and subtraction of signed numbers, Adders, ALU design, Bit slice processor, Multiplication of positive numbers Signed operand multiplication, Fast multiplication, Integer division, Floating point numbers and operations; **Memory Systems**: Introduction, Basic concepts, Design methods; RAM memories, Read only memories, Speed size and cost, Cache memories, Performance considerations, Virtual memories, Memory, Management Requirements, Secondary storage; **Input / Output organization**: Accessing I/O devices, Interrupts, Direct memory access, Buses, Interface circuits; **Introduction to Parallel Processing:** Flynn Classification, Multi-Core Architecture, Pipelining.

B.   TEXT BOOKS

i.   T1. C. Hamacher, Z. Vranesic, S. Zaky, "Computer Organization", Tata McGraw Hill (TMH), 5th Edition, 2002.

ii. T2. M. Morris Mano, "Computer System Architecture", Pearson, 3rd Edition Revised, 2017.