



**Department of Computer Science & Engineering**  
National Institute of Technology, Jamshedpur  
(An institution of national importance under MHRD, Govt. of India)

**SPRING SEMESTER (B.Tech 4<sup>th</sup> Sem.) 2019 – 2020**

**Course Handout**

<b>Course No. :</b>	<b>CS1405</b>
<b>Course Title :</b>	<b>Computer Organization and Architecture (3-1-0)</b>
<b>Credit :</b>	<b>4</b>
<b>Instructor-In-Charge :</b>	<b>Dr. Ritesh Kumar</b>

**COURSE OBJECTIVE:**

Computer Organization is study of the system from software point of view and gives overall description of the system and working principles without going into much detail. In other words, it is mainly about the programmer's or user point of view.

Computer Architecture is study of the system from hardware point of view and emphasis on how the system is implemented. Basically, throws light on the designer's point of view.

<b>S. No.</b>	<b>Topics</b>	<b>No. of Lectures</b>
1	Concepts and Terminology: Digital computer components Hardware & Software and their dual nature, Role of Operating Systems (OS).	1-5
2	The ALU: ALU organization, Integer representation, Serial and Parallel Adders, 1s and 2s complement arithmetic, Multiplication of signed binary numbers, floating point number arithmetic, Overflow detection, Status flags.	6-15
3	Memory Unit: Memory classification, Bipolar and MOS storage cells. Organization of RAM, address decoding, Registers and stack, ROM and PROM-basic cell. Organization and erasing schemes, Magnetic memories-recording formats and methods. Disk and tape Units. Concept of memory map. Timing diagrams, T-States, Timing diagram Controlling arithmetic and logic instructions. Instruction sequencing with examples. Introduction to Micro- programming, Variations in Micro-programming configuration	16-30
4	General Organization: Instruction work formats, Addressing modes registers, Von-Neumann concept, interconnecting system components, Interfacing buses, Timing diagrams, Examples from popular machines.	31-40

***Text books/References :***

- 1 Hayes J. P., "Computer Architecture & Organisation", McGraw Hill,
- 2 Hamacher, "Computer Organisation",
- 3 Computer Organization and System Software, EXCEL BOOKS
- 4 Chaudhuri P. Pal, "Computer Organisation & Design", PHI,
- 5 Computer Organization & Architecture, Ghosh & Pal, TMH

**EVALUATION SCHEME:**

<b>EC No.</b>	<b>Evaluation Component</b>	<b>Duration</b>	<b>Weightage</b>
1	Mid Sem	2 Hrs.	30%
2	End Sem	3 Hrs.	50%
3	Surprise Quizzes/Assignments		20%

***Instructor In-Charge***  
**(CS1405)**