Computer Engineering Department, NIT Surat, INDIA

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B.Tech. II (CO) Semester - 3	L	T	P	C
CO201 : Computer Organization (CS-I)	3	1	2	5

COURSE OUTCOMES

After successful completion of this course, student will be able to
• Understand and describe the basics of various architectural units of the Computer System
• Apply the knowledge of combinational and sequential logical circuits to mimic simple computer architecture.
• Demonstrate the simulations for basic computer operations
• Recognize the importance of parallelism in computer architecture.

COURSE CONTENT

• **Introduction**	**(2 Hours)**
Number System and Representation of information, Arithmetic and Logical operation and hardware implementation, Software implementation of some complex operation.	**(3 Hours)**
Arithmetic and Logic Unit, Introduction to memory Unit, control unit and Instruction Set, Working with an ALU	**(3 Hours)**
Concepts of Machine level programming, Assembly level programming and High level programming	**(3 Hours)**
Various addressing modes and designing of an Instruction set	**(3 Hours)**
Concepts of subroutine and subroutine call, Use of stack for handling subroutine call and return	**(3 Hours)**
Introduction to CPU design, Instruction interpretation and execution	**(3 Hours)**
• **Memory**	**(06 Hours)**
Concepts of semiconductor memory, CPU-memory interaction, organization of memory modules, Cache memory and related mapping and replacement policies, Virtual memory.	
• **Input - Output**	**(08 Hours)**
Introduction to input/output processing, working with video display unit and keyboard and routine to control them, Programmed controlled I/O transfer, Interrupt controlled I/O transfer, DMA controller, Secondary storage and type of storage devices, Introduction to buses and connecting I/O, devices to CPU and memory.	
• **Introduction to ASIC, FPGA, VHDL, HDL concepts**	**(08 Hours)**
• **Tutorials will be based on the coverage of the above topics separately**	**(14 Hours)**
(Total Contact Time: 42 Hours + 14 Hours = 56 Hours)	

PRACTICALS

1. Design and simulation of CPU.
2. Simulation of Memory management techniques.
3. Simulation of I/O device management
4. Mini project based on CPU design using advanced tools.

BOOKS RECOMMENDED

1. John L. Hannessy, David A. Patterson - "Computer organization and Design", 3/E, Morgan Kaufmaan, reprint -2003
2. Tanenbaum - "Structured Computer Organization", 6/E, PHI EEE, reprint 1995
3. Stallings,"Computer Organization & Architecture : Designing For Performance", 6/E, PHI, 2002
4. Hamacher - "Computer Organization", 5/E, McGraw-Hill, 2001
5. Morris Mano - "Computer Systems Architecture", 3/E, PHI, reprint 1997