COURSE STRUCTURE OF B. TECH IN COMPUTER SCIENCE & ENGINEERING, HIT

Subject Name: Computer Organization					
Paper Code: CSEN 2203					
Contact Hours per week	**L**	**T**	**P**	**Total**	**Credit Points**
	3	**1**	**0**	**4**	**4**

Module No-1: Basics of Computer Organization: (10L)

Basic organization of the stored program computer and operation sequence for execution of a program, Von Neumann & Harvard Architecture. RISC vs. CISC based architecture. (4L)

Fetch, decode and execute cycle, Concept of registers and storage, Instruction format, Instruction sets and addressing modes. (6L)

Module No-2: Basics of ALU Design: (10L)

Binary number representation; Fixed and Floating point representation of numbers. (2L)

Adders: Serial and Parallel adders, Ripple Carry / Carry Lookahead / Carry Save; (4L)

Multipliers & Divider Circuits: Multiplication of signed binary numbers Booth Multipliers; (4L)

Module No-3: Basics of Control Unit Design and Pipelining: (12L)

Design of a control unit: Data path design. (8L)
Single Cycle Datapath for : ALU design / Data Movement Instructions / Control Unit Design;
Multi cycle microarchitecture; concept of states and transitions;
Hardwired and Microprogrammed control. The state machine;
Horizontal and Vertical micro instruction, Microprogrammed control design techniques;

Pipelining: (4L)
Basic concepts, Instruction and arithmetic pipeline; Elementary concepts of hazards in pipeline and techniques for their removal.

Module No-4: Memory and I/O Organization: (10L)
Memory system overview, Cache memory organizations, Techniques for reducing cache misses, Hierarchical memory technology: Inclusion, Coherence and locality properties, Virtual Memory, Memory mapped IO. (6L)

Introduction to I/O interfaces. Interrupts, Interrupt hardware, Enabling and
Disabling interrupts, Concept of handshaking, Polled I/O, Priorities, Daisy Chaining. Vectored interrupts; Direct memory access, DMA controller. Instruction sequencing with examples. (4L)

COURSE STRUCTURE OF B. TECH IN COMPUTER SCIENCE & ENGINEERING, HIT

Text Books:

1. Computer Organization, 5th Edition, Carl Hamacher, Zvonko Vranesic, Safwat Zaky, MGH
2. Computer System Architecture, 3rd Edition, Morris M. Mano, Pearson
3. Computer Organization and Design: The Hardware/Software interface, David A. Patterson and John L. Hennessy, 3rd Edition, Elsevier, 2005.
4. NPTEL materials on Computer Organization.