CS-303: COMPUTER ARCHITECTURE AND ORGANIZATION

Teaching Scheme			Credits	Marks			Duration End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	0	0	3	40	60	100	3 hrs

COURSE CONTENT:

UNIT	CONTENT	No. of Hrs.
I	**Basics of Digital Electronics:** Codes, logic gates, flip flops, registers, counters, multiplexer, demultiplexer, decoder, and encoder. **Register Transfer and Micro operations:** Register transfer language, register transfer, bus & memory transfer, logic micro operations, shift micro operation. **Computer Arithmetic:** Unsigned, signed and floating point data representation, addition, subtraction, multiplication and division algorithms. booths multiplication algorithm.	10
II	**Basic Computer Organization:** Instruction codes, computer instructions, timing & control, instruction cycles, memory reference instruction, input/output & interrupts, complete computer description & design of basic computer. **Control Unit:** Hardwired vs. micro programmed control unit. **Central Processing Unit:** General register organization, stack organization, instruction format, addressing modes, data transfer & manipulation, program control, RISC, CISC.	10
III	**Input-Output Organization:** Peripheral devices, I/O interface, Modes of data transfer: Programmed I/O, Interrupt-Initiated I/O, DMA transfer, I/O processor. Serial Communication. **Memory Unit:** Memory hierarchy, processor vs. memory speed, main memory, auxiliary memories, high-speed memories, cache memory, associative memory, virtual memory, and memory management hardware.	10
IV	**Introduction to Parallel Processing:** Flyn's classification, pipelining, arithmetic pipeline, instruction pipeline, characteristics of multiprocessors, interconnection structures, interprocessor arbitration, interprocessor communication & synchronization. Performance evaluation SPEC marks LINPACK Whetstone Dhrystone etc., transaction processing benchmarks. **Case Studies:** Case studies of some contemporary advanced architecture for	9

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	processors of families like Intel, AMD, IBM etc./Seminar on state-of the-art technology.	

Text Books:

1. Mano, Morris M., Computer System Architecture, Prentice Hall
2. Hayes, J.P., Computer Architecture and Organization, McGraw Hill

Reference Books:

1. Hennessy, J.L., Patterson, D.A, and Goldberg, D., Computer Architecture A Quantitative Approach, Pearson Education Asia
2. Leigh, W.E. and Ali, D.L., System Architecture: software and hardware concepts, South Wester Publishing Co.