ADVANCED COMPUTER ARCHITECTURE

(Professional Elective-IV)

COURSE CODE: 15CS1104

L	T	P	C
3	0	0	3

Pre-requisites: Computer Organization

COURSE OUTCOMES:

At the end of the course the student shall be able to

CO1: Explain the fundamentals of computer design and instruction set principles.

CO2: Measure instruction level parallelism (ILP) and Interpret VLIW approach.

CO3: Determine cache performance.

CO4: Summarize multiprocessor and thread Level Parallelism.

CO5: Analyze interconnection networks and clusters.

UNIT-I **(8-10 Lectures)**

Fundamentals of Computer design- Technology trends- cost measuring and reporting performance quantitative principles of computer design. Instruction set principles and examples- classifying instruction set- memory addressing- type and size of operands addressing modes for signal processing-operations in the instruction set- instructions for control flow- encoding an instruction set.-the role of compiler.

UNIT-II **(8-10 Lectures)**

Instruction level parallelism (ILP)- over coming data hazards- reducing branch costs –high performance instruction delivery- hardware based speculation- limitation of ILP. ILP software approach- compiler techniques- static branch protection - VLIW approach - H.W support for more ILP at compile time- H.W verses S.W Solutions.

UNIT-III **(8-10 Lectures)**

Memory hierarchy design- cache performance- reducing cache miss penalty and miss rate – virtual memory- protection and examples of VM.

UNIT-IV **(8-10 Lectures)**

Multiprocessors and thread level parallelism- symmetric shared memory architectures- distributed shared memory- Synchronization multithreading. Storage systems- Types – Buses - RAID- errors and failures- bench marking a storage device- designing a I/O system.

UNIT-V **(8-10 Lectures)**

Inter connection networks and clusters - interconnection network media – practical issues in inter connecting networks – examples cluster and designing a cluster.

TEXT BOOK:

John L. Hennessy & David A. Patterson Morgan Kufmann, "Computer Architecture A Quantitative Approach", 3rd Edition, An Imprint of Elsevier, 2011.

REFERENCES:

1. Kai Hwang and A.Briggs, "Computer Architecture and parallel Processin"g, 1st \ Edition , International Edition McGraw-Hill, 2004.
2. DezsoSima, Terence Fountain, Peter Kacsuk, "Advanced Computer Architectures", 1st Edition, Pearson, 2005.
3. David E. Culler, Jaswinder Pal singh, "Parallel Computer Architecture, A Hardware / Software APPROACH", 2nd Edition, Princeton, 2005.

WEB REFERENCES:

http://www.youtube.com/course? feature=edu&list = EC07FAB55C66 9A6CF0 & category = University % 2F Science % 2F Computer % 2520 Science % 2F Computer % 2520 Architecture.

***