ADVANCED COMPUTER ARCHITECTURE
(ELECTIVE-II)

Course Code: 13CS1104

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Course Educational Objectives:

The objective of this course is to provide an exposure to current and emerging trends in Computer Architectures, focusing on performance and the hardware/software interface. The emphasis is on studying and analyzing fundamental issues in architecture design and their impact on performance.

Course Outcomes:

The Student will be able to:

- Understand the advanced concepts of computer architecture.
- Expose the major differentials of RISC and CISC architectural characteristics.
- Investigating modern design structures of Pipelined and Multiprocessors systems.

UNIT-I (12 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 (12 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 (12 Lectures)

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

UNIT-IV (12 Lectures)

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

UNIT-V (12 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