

**EC6009 ADVANCED COMPUTER ARCHITECTURE**

**L T P C 3 0 0 3**

**UNIT I FUNDAMENTALS OF COMPUTER DESIGN 9**

Review of Fundamentals of CPU, Memory and IO – Trends in technology, power, energy and cost, Dependability - Performance Evaluation

**UNIT II INSTRUCTION LEVEL PARALLELISM 9**

ILP concepts – Pipelining overview - Compiler Techniques for Exposing ILP – Dynamic Branch Prediction – Dynamic Scheduling – Multiple instruction Issue – Hardware Based Speculation – Static scheduling - Multi-threading - Limitations of ILP – Case Studies.

**UNIT III DATA-LEVEL PARALLELISM 9**

Vector architecture – SIMD extensions – Graphics Processing units – Loop level parallelism.

**UNIT IV THREAD LEVEL PARALLELISM**

Symmetric and Distributed Shared Memory Architectures – Performance Issues –Synchronization – Models of Memory Consistency – Case studies: Intel i7 Processor, SMT & CMP Processors

**UNIT V MEMORY AND I/O 9**

Cache Performance – Reducing Cache Miss Penalty and Miss Rate – Reducing Hit Time – Main Memory and Performance – Memory Technology. Types of Storage Devices – Buses – RAID – Reliability, Availability and Dependability – I/O Performance Measures.

**TEXT BOOK:**

1. John L Hennessey and David A Patterson, "Computer Architecture A Quantitative Approach", Morgan Kaufmann/ Elsevier, Fifth Edition, 2012.

**REFERENCES:**

1. Kai Hwang and Faye Briggs, "Computer Architecture and Parallel Processing", Mc Graw-Hill International Edition, 2000.

2. Sima D, Fountain T and Kacsuk P,"Advanced Computer Architectures: A Design Space Approach", Addison Wesley, 2000