Computer Architecture

Instructor: Prof. Chung-Ho Chen (陳中和)
Office: 92625 EE building, chchen@mail.ncku.edu.tw
Text: Computer architecture, A quantitative approach,
D. A. Patterson and J. L. Hennessy.
Web page: http://caslab.ee.ncku.edu.tw
Class Format

- Review
- Lecture
- Administrative Matters
- Lecture/Discussion
- LAB: Full System Designs
- *Discussion based on your readings of papers*
Course outline

- Chapter 1: Fundamentals, 50 p.
  - Fundamentals of computer design
- Chapter 2: Instruction level parallelism, 80 p.
  - ILP architectures
  - Dependencies
  - ILP study
  - Dynamic scheduling (Tomasulo’s algorithm)
  - Branch predictions
- Chapter 3: Limit of Instruction level parallelism, 40 p.
- Chapter 4: Multiprocessor and thread-level parallelism, 60 p.
Course outline (cont.)

- Chapter 5: Memory hierarchy design, 50 p.
- Chapter 6: Storage systems, 50 p.
  - Advanced topics in storage

- Special topics:
  - GPU, OpenCL
  - Processor testing and verification
  - ESL full systems
Grading

- 20% Project (Software-and-Hardware Full System Design and Simulation)
- 60% Examinations (3 Quizzes)
- 20% Class Participation and Paper reviews