WEEK #1: May 22-24
Course Introduction. Historical Perspective.

Computer design fundamentals; principle of quantitative analysis; instruction set architectures.

Pipelining: review of basic concepts; Case study: the RISC-V ISA.

WEEK #2: May 29-31
Pipelining: implementation issues; multi-cycle operations.

Instruction-Level Parallelism: dynamic scheduling; scoreboard.


WEEK #3: June 5-7
Memory-Hierarchy Design: virtual memory; Case study: Intel Pentium 4 vs. AMD Opteron.


Instruction-Level Parallelism: branch prediction and speculation. Case study: Alpha 21264.

WEEK #4: June 12-14

The Crisis of Traditional Processor Architectures.


WEEK #5: June 19-21
Parallel Architectures: memory consistency model & cache coherency.

Parallel Architectures: data-level parallelism and vector processors.

Parallel Architectures: graphics processing units. Case study: NVIDIA GPUs.

WEEK #6: June 26-28
Multi-Core Architectures: embedded and mobile computing. Case Studies: ARM-based architectures.


Perspective: “The Emergence of Heterogeneous Systems-on-Chip: Opportunities and Challenges.”

FINAL EXAM: time & location to be announced.