Course Description

Prerequisites: An undergraduate course in Computer Organization, Introduction to Computer architecture, or equivalent.

This course is intended to cover modern computer system designs and architectures. The first part of the course will focus on principles of computer design and cost/performance factors; instruction set design and implementation, RISC instruction sets; control unit and pipeline design; floating-point arithmetic; memory hierarchy designs, caches, memory interleaving, virtual memory; I/O device interconnections to CPUs and main memory.

The second part of the course will cover advanced computer architectures. These include parallel system designs, interconnection networks for processors and memories; optimization of pipeline operations; superscalar architectures.

Grading: Exam 1: 30%

Exam 2: 30%

Exact dates to be announced by instructor later.

Exam 3: 40%

Homework (Textbook readings and readings of articles from the technical literature, and assigned problems some of which are similar to exam problems)

Required/Recommended Textbooks

Principal References:


### Course Outline

1. Principles of computer design; cost/performance of design options;

2. Processor design: instruction set design and implementation; pipelining; floating-point arithmetic;

3. Memory-Hierarchy design: caches; main memory design (e.g., interleaving); virtual memory; performance analysis;

4. Input/Output design: I/O performance measures, types of I/O devices, I/O device connection to CPU/Main Memory;

5. Parallel system design

6. Interconnection networks for processors and memories

7. Pipeline optimizations, superscalar processor architectures.

### Code of Academic Integrity

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity of the Student Honor Council, please visit [http://shc.umd.edu/SHC/HonorPledgeInformation.aspx](http://shc.umd.edu/SHC/HonorPledgeInformation.aspx).