CPE432: Computer Design

Course Introduction

Prof. Gheith Abandah
أ.د. غيث علي عبندة

Outline

- **Course Information**
- **Textbook and References**
- **Course Objectives and Outcomes**
- **Course Topics**
- **Policies**
- **Grading**
- **Important Dates**

Course Information

- Instructor: **Prof. Gheith Abandah**
- Email: **abandah@ju.edu.jo**
- Office: **CPE 406**
- Home page: **http://www.abandah.com/gheith**
- Facebook group:

  https://www.facebook.com/groups/549894571732525/

- Prerequisites: **CPE 335: Computer Organization**
- Office hours: **Mon through Thu: 11:00 – 12:00**

Textbook and References

- **Patterson and Hennessy, Computer Organization and Design: The Hardware/Software Interface, RISC-V ed., Morgan Kaufmann, Elsevier Inc., 2018.**
- References:
  - Hennessy and Patterson. Computer Architecture: A Quantitative Approach, 6th ed., Morgan Kaufmann, Elsevier Inc., 2017.
  - J. P. Shen and M. H. Lipasti. Modern Processor Design: Fundamentals of Superscalar Processors, Mc Graw Hill, 2005.
  - D. Culler and J.P. Singh with A. Gupta. Parallel Computer Architecture: A Hardware/Software Approach, Morgan Kaufmann, 1998.
  - J. Hayes. Computer Architecture and Organization, 3rd ed., McGraw-Hill, 1998.
- Course slides at: http://www.abandah.com/gheith/?page_id=2057

Course Objectives

- Introduce students to the technological changes in designing and building processors and computers.
- Introduce students to the advanced techniques used in modern processors including pipelining, branch prediction, dynamic and speculative execution, multiple issue, multithreading, and software optimizations.
- Introduce the students to the basic concepts and technologies used in designing memory and storage systems including cache, main memory, virtual memory, and secondary memory.
- Introduce the students to the various approaches in parallel processing including SIMD extensions, vector processors, GPUs, multicore processors, shared memory multiprocessors, clusters, and message-passing multicomputers.

Course Outcomes

- Understand and analyze the performance of single-processor architectures, as well as multiprocessor architectures [a].
- Understand and analyze the performance of memory hierarchy levels [a].
- Understand the technological improvements and the effect of these improvements on modern computers [h].
- Survey research papers that describe contemporary issues in computer design [i, j].

Course Topics

- Introduction
- Computer Technology and Performance (1.5–1.11)
- Processor: Instruction-Level Parallelism (4.6–4.11, 4.14–4.15)

Midterm Exam

- Memory Hierarchy (5.1–5.11, 5.13, 5.16–5.17)
- Parallel Processors (6.1–6.8, 6.10–6.14)

Final Exam

Policies

- Attendance is required
- All submitted work must be yours
- Cheating will not be tolerated
- Open-book exams
- Join the facebook group
- Check department announcements at: http://www.facebook.com/pages/Computer-Engineering-Department/369639656466107

Grading

- **Quizzes 1 & 2** **15%**
- **Research Project** **15%**
- **Midterm Exam** **30%**
- **Final Exam** **40%**

Important Dates

Mon 21 Jan, 2019	First Lecture
Mon 18 Feb, 2019	Quiz 1
Mon 18 Mar, 2019	Midterm Exam
Mon 15 Apr, 2019	Quiz 2
Mon 22 Apr, 2019	Project Report Due
Mon 29 Apr, 2019	Last Lecture
May 5 – 13, 2019	Final Exam Period