



**King Saud University**  
**College of Computer and Information Sciences**  
**Department of Information Technology**

**CAP223 - Computer Architecture (3–0-1)**

**Semester II, Academic Year 2009-2010**

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**1. Course Description (catalog):**

This course will provide students with a thorough understanding of the computer architecture by designing a simple processor and memory system starting from basic logic gates. Topics include: digital logic: logic expressions, minimization, sum of product forms, fundamental building blocks (logic gates, flip-flops, decoders, encoder, multiplexer, arithmetic functions, counters, registers), register transfer notation, memory, bus and CPU (datapath and control unit) design.

**2. Prerequisites:**

CAP 221

**3. Textbook(s) and/or Other Required Materials:**

**Primary:**

Logic and Computer Design Fundamentals, By M. Morris Mano and Charles R. Kime  
4th edition or 3rd edition.

**Supplementary:**

- Computer Architecture, By M. Morris Mano
- Computer Organization and Architecture, By William Stallings

**4. Course Outcomes:** This course requires the student to demonstrate the following:

1. Identify major components and their interactions in computer architecture
2. Apply Boolean Algebra and Symbolic Logic to Circuit Design
3. Analyze, Design and Minimize Combinational Circuits using Karnaugh Maps
4. Utilize Flip Flops to Design Sequential Circuits.
5. Analyze and design sequential circuits.
6. Design Counters, Registers and other Circuits utilizing registers description.
7. Define basic memory systems.)
8. Design the data path of a computer.
9. Design the control unit of a computer.
10. Implement a simple instruction set computer with a control unit and a data path.
11. Design a simple computer (CPU and memory system) .

## 5. Topics Covered:

1. Combinational Logic Circuits: [Chapter 2](#)
2. Combinational Logic Design: [Chapter 3](#)
3. Arithmetic Functions: [Chapter 4](#)
4. Sequential Circuits: [Chapter 5](#)
5. Registers and Register Transfers: [Chapter 7](#)
6. Memory Basics: [Chapter 8](#)
7. Computer Design Basics: [Chapter 9](#)

## 6. Assessment Plan for the Course

	Percentage
Quizzes	15
Midterms	40
Assignments	5
Final	40
Total	100

## 7. Course Policies:

- The course consists of *all* topics covered in lectures, tutorials, assigned reading, etc.
- Cheating will not be tolerated in any form
- All exams are closed book.
- Assignments will not be accepted late.

For course slides, assignments, marks,.. see instructor web page at:

<http://faculty.ksu.edu.sa/feryal9>

For assignments, exam dates, announcements,.. see also course web page at:

<http://www.ksu-it.com/cap223/>

## Instructor, Department, Date:

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