

# COMPUTER ARCHITECTURE

Jo, Heeseung

# Class materials

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<http://cslab.cbnu.ac.kr>

- <http://software.cbnu.ac.kr> > 학과소개 > 교수진소개 > 조회승

## Instructor

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# Course description

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Computer architectures have been drastically evolved since early 1980. Pipelining, cache, and branch prediction have been major features in modern microprocessor design. They are invented for high performance processors first, and then equipped in PC processors we are using every day.

## Topics & Materials

Digital logic design - 데이터 표현

Digital logic design - 논리회로 기초

Digital logic design - 조합논리회로

Digital logic design - 순차논리소자

Computer Abstractions and Technology

Instructions Language of the Computer

Arithmetic for Computers

The Processor1

The Processor2

Memory Hierarchy 1

Memory Hierarchy 2

Storage and Other IO Topics

# Prerequisites

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## Prerequisites

- Mathematics in high school
- Introduction to computer systems
- Digital logic design

You should be familiar with the followings:

- Basic computer organization
- Computer hardware
- C programming skills

# Timetable

## 시간표

2024년 일반 1학기, 성명 : 조희승

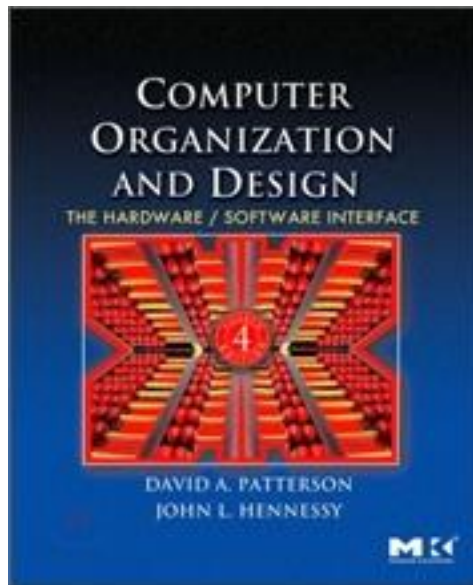
출력일시 : 2024-02-27 11:44:26

교시	월	화	수(50)	목	금(50)
0교시 08:00 ~ 08:50					
1교시 09:00 ~ 09:50					시 오픈소스 전문포괄채트 5119002-01 조희승 34-1-204(21-204) 1교시
2교시 10:00 ~ 10:50					시 오픈소스 전문포괄채트 5119002-01 조희승 34-1-204(21-204) 2교시
3교시 11:00 ~ 11:50					시 오픈소스 전문포괄채트 5119002-01 조희승 34-1-204(21-204) 3교시
4교시 12:00 ~ 12:50					시 오픈소스 전문포괄채트 5119002-01 조희승 34-1-204(21-204) 4교시
5교시 13:00 ~ 13:50		운영체제 5118020-01 조희승 34-1-106(21-106) 5교시			
6교시 14:00 ~ 14:50					
7교시 15:00 ~ 15:50			컴퓨터구조 5118007-01 조희승 34-1-106(21-106) 7교시		
8교시 16:00 ~ 16:50	운영체제 5118020-01 조희승 34-1-106(21-106) 8교시	컴퓨터구조 5118007-01 조희승 34-1-106(21-106) 8교시			운영체제 5118020-02 조희승 34-1-104(21-104) 8교시
9교시 17:00 ~ 17:50	운영체제 5118020-01 조희승 34-1-106(21-106) 9교시	컴퓨터구조 5118007-01 조희승 34-1-106(21-106) 9교시	운영체제 5118020-02 조희승 34-1-104(21-104) 9교시		운영체제 5118020-02 조희승 34-1-104(21-104) 9교시
10교시 18:00 ~ 18:50					

# Textbook

## Computer Organization and Design – The Hardware/Software Interface

- David A. Patterson and John L. Hennessy, Morgan Kaufmann Publishers
- [MIPS version](#) (Not ARM version)



# Reference

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동작 원리 중심의 논리회로와 컴퓨터 구조

- 전중남, 배움터

한 눈에 보이는 컴퓨터구조

- 전중남, 생능출판사

Computer Systems: A Programmer's Perspective

- Randal E. Bryant and David R. O'Hallaron,, Prentice Hall Inc.

Computer Architecture - A Quantitative Approach

- John L. Hennessy and David A. Patterson, Morgan Kaufmann Publishers.

# Grading

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## Grading ratio (Subject to change)

- Exams: 75%
- Homework: 15%
- Etc: 10%

## No cheating

- Sharing or copying of solutions
- Of course, cooperation on exams, homework, and projects
- Definitely F



# Attendance policy

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Do not be late!

- You should be present when I take class attendance

You can miss the class up to "three" times without any penalty

- More than 3 times, then D

Reserved seat in class

- We will use reserved seat in this class for this semester
- Your seat will be reserved at the next class

# Computer architecture

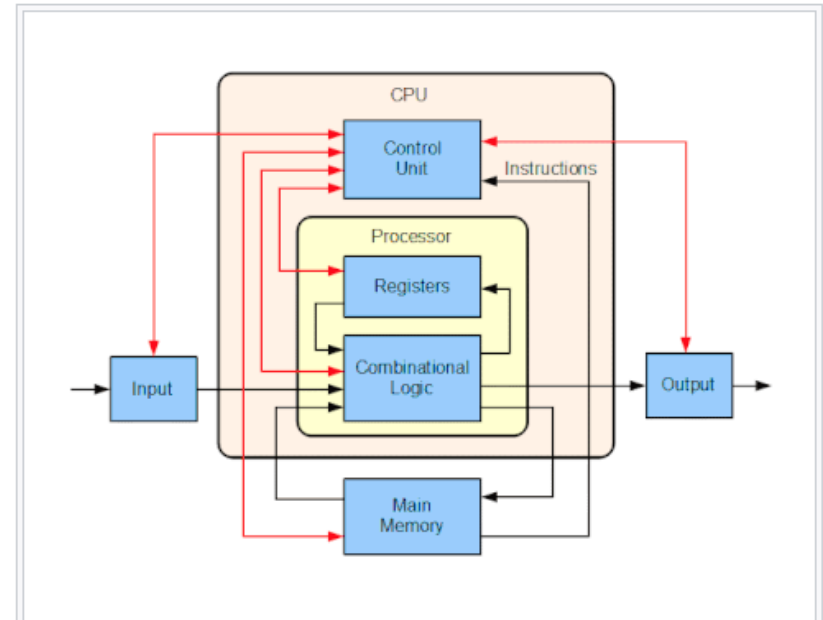
## Computer architecture

From Wikipedia, the free encyclopedia

In **computer engineering**, **computer architecture** is a set of rules and methods that describe the functionality, organization, and implementation of computer systems. Some definitions of architecture define it as describing the capabilities and programming model of a computer but not a particular implementation.<sup>[1]</sup> In other definitions computer architecture involves **instruction set architecture** design, **microarchitecture** design, **logic design**, and **implementation**.<sup>[2]</sup>

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- Subcategories
- Roles
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  - 3.2 Instruction set architecture
  - 3.3 Computer organization
  - 3.4 Implementation
- Design goals
  - 4.1 Performance
  - 4.2 Power efficiency
  - 4.3 Shifts in market demand
- See also
- References
- Sources
- External links



Block diagram of a basic computer with uniprocessor CPU. Black lines indicate data flow, whereas red lines indicate control flow. Arrows indicate the direction of flow.

## History [edit]

The first documented computer architecture was in the correspondence between **Charles Babbage** and **Ada Lovelace**, describing the **analytical engine**. When building the computer **Z1** in 1936, **Konrad Zuse** described in two patent applications for his future projects that machine instructions could be stored in the same storage used for data, i.e., the **stored-program** concept.<sup>[3][4]</sup> Two other early and important examples are:

- **John von Neumann's** 1945 paper, **First Draft of a Report on the EDVAC**, which described an organization of logical elements;<sup>[5]</sup> and