

## Extended Syllabus

(2024 1<sup>ST</sup> Semester)

Course Title	컴퓨터아키텍처	Course Number	CSE4010
Credit	3학점	Enrollment Eligibility	3학년
Class Time	수13:30~14:45, 금13:30~14:45	Classroom	추후 공지

Instructor's Photo	Name: 김주호 (Juho Kim)	Homepage: cslab.sogang.ac.kr
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### I . Course Overview

1. Description							
<p>This course is linked courses of "Introduction of Digital circuit"</p> <p>The course covers understanding the overall structure of the system, hardware components and memory.</p>							
2. Prerequisites							
<p>Requires reconfirm following contents of prerequisite lecture "Introduction of Digital Circuit"</p> <ul style="list-style-type: none"><li>- Understanding the computer system's design via the logic circuit that the base of computer system and learning ability to analyze the working principle of real logic circuits.</li><li>- Design and combine the each logic circuit.</li><li>- Design digital logic circuit that meets the conditions and obtain the desired result with each logic circuit.</li></ul>							
3. Course Format (%)							
Lecture	Discussion	Experiment/Practicum	Field study	Presentations	Other		
100 %	%	%	%	%	%		
4. Evaluation (%)							
mid-term Exam	Final exam	Quizzes	Presentations	Projects	Assignments	Participation	Other
30 %	40 %	20 %	%	%	10 %	%	%

## II. Course Objectives

1. Through an understanding of the computer system's basic hardware components such as the CPU, memory, and I/O, acquire the structure and the configuration principle of the computer system to analysis computer architecture.
2. Learning ability to design a simple system structure such as CPU, memory, etc.
3. Learning practical problem solving methods through the analysis of hardware components
4. Developing international capabilities through an English presentation on the study of the latest trends in technology.

## III. Course Format

(\* In detail)

- Interaction lecture: Communicate with students
- Q&A and Discussions: Lecture to proceed freely with Q&A and discussions

## IV. Course Requirements and Grading Criteria

- Examination (3)  
Mid-term exam, Final exam, and Quiz
- Assignment
  1. Assignment (3)
  2. Solve exercise each chapter
  3. Show a calculation and solution process when solved exercises.

## V. Course Policies

### 1. Earnest attitude

In every lectures, students have to prepare and review thoroughly. Because the students, that talk, sleep in class and don't take class hard, can interrupt other students and ruin class climate, they must keep from those behavior.

### 2. Manners preservation

#### a. A relationship with professor

A relationship between professors and students is not defined as short-term and individual. Then, students should be careful in one's speech and behavior every time and interact others as a member of "Sogang university community" and "Educational specialist community".

#### b. A relationship with colleague

A relationship with other students in the class is not defined as short-term, temporary and emotional, and students should be careful in one's speech and behavior to be relationship that can encourage and evaluate each other positively.

## VI. Materials and References

- Computer Organization and Design, 2010, Patterson and Hennessy, Morgan Kaufmann Pub, 4th Edition
- Logic and Computer Design Fundamentals, 2008, M. Mano, Prentice Hall, 4th Edition

## VII. Course Schedule

(\* Subject to change)

Week 1	Learning Objectives	Computer Abstraction and Technology I
	Topics	The trend of computer technology and performance
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Computer Organization and Design, 2010, Patterson and Hennessy, Morgan Kaufmann Pub, 4th Edition
	Assignments	

Week 2	Learning Objectives	Computer Abstraction and Technology II
	Topics	The trend of computer technology and performance
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Computer Organization and Design, 2010, Patterson and Hennessy, Morgan Kaufmann Pub, 4th Edition
Week 3	Assignments	
	Learning Objectives	Instructions: Language of the Computer I
	Topics	
	Class Work (Methods)	Lecture
Week 4	Materials (Required Readings)	Computer Organization and Design, 2010, Patterson and Hennessy, Morgan Kaufmann Pub, 4th Edition
	Assignments	
	Learning Objectives	Instructions: Language of the Computer II
	Topics	
Week 5	Class Work (Methods)	Lecture
	Materials (Required Readings)	Computer Organization and Design, 2010, Patterson and Hennessy, Morgan Kaufmann Pub, 4th Edition
	Assignments	
	Learning Objectives	Arithmetic for Computers I
Week 6	Topics	
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Computer Organization and Design, 2010, Patterson and Hennessy, Morgan Kaufmann Pub, 4th Edition
	Assignments	

	Assignments	
Week 6	Learning Objectives	Arithmetic for Computers II
	Topics	
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Computer Organization and Design, 2010, Patterson and Hennessy, Morgan Kaufmann Pub, 4th Edition
	Assignments	
Week 7	Learning Objectives	Arithmetic for Computers III
	Topics	
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Computer Organization and Design, 2010, Patterson and Hennessy, Morgan Kaufmann Pub, 4th Edition
	Assignments	
Week 8	Learning Objectives	Mid-Term Exam
	Topics	Mid-Term Exam
	Class Work (Methods)	Mid-Term Exam
	Materials (Required Readings)	Mid-Term Exam
	Assignments	Mid-Term Exam
Week 9	Learning Objectives	The Processor I
	Topics	The structure/operation of data path and control Unit in CPU

	<b>Class Work (Methods)</b>	Lecture
	<b>Materials (Required Readings)</b>	Computer Organization and Design, 2010, Patterson and Hennessy, Morgan Kaufmann Pub, 4th Edition
	<b>Assignments</b>	
Week 10	<b>Learning Objectives</b>	The Processor II
	<b>Topics</b>	The Pipelining processing of data path in CPU
	<b>Class Work (Methods)</b>	Lecture
	<b>Materials (Required Readings)</b>	Computer Organization and Design, 2010, Patterson and Hennessy, Morgan Kaufmann Pub, 4th Edition
	<b>Assignments</b>	
Week 11	<b>Learning Objectives</b>	The Processor III
	<b>Topics</b>	At pipelining, methods to solve the hazard
	<b>Class Work (Methods)</b>	Lecture
	<b>Materials (Required Readings)</b>	Computer Organization and Design, 2010, Patterson and Hennessy, Morgan Kaufmann Pub, 4th Edition
	<b>Assignments</b>	
Week 12	<b>Learning Objectives</b>	Large and Fast: Exploiting Memory Hierarchy I
	<b>Topics</b>	The locality and cache in memory hierarchy
	<b>Class Work (Methods)</b>	Lecture
	<b>Materials (Required Readings)</b>	Computer Organization and Design, 2010, Patterson and Hennessy, Morgan Kaufmann Pub, 4th Edition
	<b>Assignments</b>	

Week 13	Learning Objectives	Large and Fast: Exploiting Memory Hierarchy II
	Topics	The various structure and performance of cache
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Computer Organization and Design, 2010, Patterson and Hennessy, Morgan Kaufmann Pub, 4th Edition
	Assignments	
Week 14	Learning Objectives	Large and Fast: Exploiting Memory Hierarchy III
	Topics	Virtual memory
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Computer Organization and Design, 2010, Patterson and Hennessy, Morgan Kaufmann Pub, 4th Edition
	Assignments	
Week 15	Learning Objectives	Storage and Other I/O Topics
	Topics	Storage and IO device
	Class Work (Methods)	Lecture
	Materials (Required Readings)	Computer Organization and Design, 2010, Patterson and Hennessy, Morgan Kaufmann Pub, 4th Edition
	Assignments	
Week 16	Learning Objectives	Final exam
	Topics	Final exam
	Class Work (Methods)	Final exam

	Materials (Required Readings)	Final exam
	Assignments	Final exam

#### VIII. Special Accommodations

Please contact me for some helps if you have some physical problems in taking this course.