



## Syllabus 2017 Computer and Mathematical Sciences

### Computer Architecture

Japanese

#### Basic information

held this year:	yes
instructor(s)	Prof. Hiroaki Kobayashi
room	GSIS-middle
schedule	The latter period (Tuesday) 10:30-12:00
begins on:	10/03

#### Objectives and outline

The term "computer architecture" means the concept of designing computers and is also its philosophy. This course begins with the basic principles of computers, and then talks about instruction-level parallel processing, vector processing, parallel computing systems, and their control mechanisms. Supercomputing techniques such as vector systems and accelerators are also reviewed. See the class web page <http://www.cal.is.tohoku.ac.jp/class/architecture/> for more details. (Contact instructors to have an access ID).

#### Class plan

- 1 Introduction to Computer Architecture
- 2 Instruction Set Principles and Examples
- 3 Pipelining
- 4 Instruction-Level Parallelism and Its Exploitation I
- 5 Instruction-Level Parallelism and Its Exploitation II
- 6 Instruction-Level Parallelism and Its Exploitation III
- 7 Memory Hierarchy I
- 8 Memory Hierarchy II
- 9 Multicores, Multiprocessors, and Clusters I
- 10 Multicores, Multiprocessors, and Clusters II
- 11 Vector Processors
- 12 Graphics Processor I
- 13 Graphics Processor II
- 14 Graphics Processor III

#### Evaluation

Evaluated based on the results of two or three home assignments as mid-term and final exams

#### Textbook(s)

- 1 Computer Architecture: A Quantitative Approach, 5th Edition
  - \* John L. Hennessy and David A. Patterson
  - \* Morgan Kaufmann, 2011
  - \* ISBN:9780123838728
- 2 Computer Organization and Design: The Hardware/Software Interface, 4th Edition
  - \* John L. Hennessy and David A. Patterson
  - \* Morgan Kaufmann, 2008
  - \* ISBN:978-0123744937/ISBN10:0123744938

#### Web site

<http://www.cal.is.tohoku.ac.jp/class/architecture/>

■ Office hours

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4:00—5:30pm, every Tuesday (An appointment in advance by e-mail or phone is needed)

■ Other information

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