Subject (English)	Fundamentals of Information Science I		Semester	Spring* Quarter Subject	Day/Slot	(1) Mon./3rd 13:00-14:30 (2) Thur./3rd 13:00-14:30
科目名 (日本語)	情報科学基礎Ⅰ					
Course Code	TB15204	Course Numbering	TMA-MEE320		Period	Apr.8 – Jun. 6, 2019*
Instructor (Post)	Hiroaki Kobayashi (Prof.)	*This is a **Quarter Subject**. Make sure not to conflict with other courses.			Campus	Aobayama
					Building	Mechanical Eng. Build. No.2
Faculty	Department of Mechanical and Aerospace Engineering		Credits	2	Class Room	Room 213
Class subject	As the learning goal, students have acquired the knowledge of circuit design and organization of modern computer systems.					

Object and summary of class

After the quick review of computer systems development in the history, the course gives the mathematical foundation for computer system design. Based on the mathematical foundation, the design methodology of basic circuits such as combinational circuits and sequential circuits is given. And then, the course describes how a computer system is constructed by using several basic combinational and sequential circuits, and discusses its functionality to carry out arithmetic and logic operations. In addition, the format of a machine language to direct operations to the computer system and its interpretation to generate control signals will be presented.

Keywords	Boolean Algebra, Circuit Design, Computer Organization

Goal of study

In this course, students should be able to:
(1) know the concept of today's computers based on the history of computers development,
(2) learn data representation for computers and the mathematical foundation of computer arithmetic, and
(3) understand the concrete structure and functionality of modern computer systems through their basic components of arithmetic unit, memory and control unit as building blocks in terms of hardware and software.

Contents and progress schedule of class

No	Date	Topics
1	4/8	Course Introduction, and History and Fundamentals of Computers
2	4/11	Number Representation: Binary Digit (Part I)
3	4/15	Number Representation: Binary Digit (Part II)
4	4/18	Boolean Algebra (Part I)
5	4/22	Boolean Algebra (Part II)
6	4/25	Combinational Logic and it Applications (Part I)
7	5/9	Combinational Logic and it Applications (Part II)
8	5/13	Sequential Logic: Basics (Part I)
9	5/16	Sequential Logic: Basics (Part II)
10	5/20	Sequential Logic: Applications (Part I)
11	5/23	Site Visit to Supercomputer Center of Tohoku University
12	5/27	Sequential Logic: Applications (Part II)
13	5/30	Organization of Computer Systems
14	6/3	Control Mechanism of Computer Systems
15	6/6	Final Examination

Preparation	-Nothing Special
Record and evaluation method	- Students will be evaluated based on: class attendance, homework assignments, reports and the final exam.
Textbook and references	David A Patterson and John L. Hennessy, Computer Organization & Design: The Hardware/Software Interface (5th Ed.), Morgan Kaufmann, ISBN 9780124077263.
Self study	homework to be given
In addition	Students are strongly recommended to take *Fundamentals of Computer Science II