Subject (English)	Basic Computer Science			Semester	Fall	Day/Slot	Fri. / 4th 14:40-16:10
科目名 (日本語)	情報科学基礎						
Course Code	VJ254F83	Course Numbering	TMA-MEE206			Period	Oct. 4, 2019 – Jan.31, 2020
Instructor (Post)	Takehiro ITO (Assoc. Prof.) Yuichi KAWAMOTO (Assoc. Prof.) Oleg KISELYOV (Assist. Prof.) Takeshi OBAYASHI (Assoc. Prof.)					Campus	Aobayama
						Building	Electrical, Information and Physics Building No.1
Faculty	School of Engineering			Credits	2	Class Room	Lecture Room 2A

Class subject	Basic Computer Science

Object and summary of class

This course provides a quick overview of four research fields of computer science to bridge fundamental theories of computer science with the cutting-edge research in our department. The course consists of four parts (given by four professors): computability theory, algorithm theory, bioinformatics, and communication network.

Keywords	computability theory, algorithm theory, bioinformatics, communication network

Goal of study

Students will come to understand the association between the fundamental knowledge about computer science and the research activities. The emphasis will be on giving a broad overview of the research areas in computer science.

Contents and progress schedule of class

No.	Date	Instructor	Contents
1	10/4	Takeshi OBAYASHI	Introduction of this course
2	10/11	Oleg KISELYOV	**Computability Theory** What is computation? What does it mean to compute? Are undecidable problems really unsolvable? What good is asking these questions? Concretely, this part is to give, however brief, a hands-on experience with computational models. The goal is to understand why there are so many models, what each model is for, what theoretical questions it is meant to elucidate -- and, more importantly, how a practical programmer may benefit from knowing them.
3	10/25		
4	11/1		
5	11/8	Takehiro ITO	**Algorithm Theory** Algorithms now play a very important role for the reliability and efficiency in several social systems. In this part, we focus on design and analysis of algorithms from the viewpoint of theoretical computer science. The main topics are as follows: - What is algorithm? - Power of "efficient" algorithms - How to evaluate algorithms - Basic techniques for algorithms
6	11/15		
7	11/22		
8	11/29	Takeshi OBAYASHI	**Bioinformatics** Living organism is a sophisticated system to decide appropriate outputs in fluctuating environment. In this part, we focus on the biological system to deeply understand general property of intelligent systems. The main topics are as follows: - Encode and decode biosystems - Gene network - Genetic diversity and adaptive evolution - Research approaches using biological big data
9	12/6		
10	12/13		
11	12/20		
12	1/10	Yuichi KAWAMOTO	**Communication Network** Communication network infrastructure needs to be resilient to natural disasters. In this part, we focus on the information and communication technology for disaster response and recovery. The main topics are as follows: - Basic technologies for communication networks - UAV network - Wireless mesh network - Device to Device (D2D) network
13	1/17		
14	1/24		
15	1/31		

Preparation	Nothing special
Record and evaluation method	Attendance to the lectures, reports, etc. Details will be announced by each professor.
Textbook and references	Textbook and references will be introduced by each professor.
Self study	Nothing special
In addition	The schedule of class above is subject to change.