

## シラバス参照

科目名/Subject	【JYPE】Basic Computer Science
科目群/Categories	Engineering
曜日・講時/Day/Period	Friday 4th (14:40-16:10)
開講年度/Year	2023
セメスター/Semester	Fall Semester
単位数/Credit(s)	2
担当教員(所属) /Instructor (Position)	TAKEHIRO ITO (Prof.)
対象/Eligibility	JYPE
使用言語/Language	English
備考/Notes	

授業題目 /Class Subject	Basic Computer Science
授業の 目的と 概要 /Objectives and Summary of Class	This course provides an 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): algorithm theory, bioinformatics, communication network, and computability theory.
学修の 到達目標 /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.
	(The order of the four parts is subject to change.)
	01. Introduction of this course
	[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: 02. What is algorithm? Power of "efficient" algorithms 03. How to evaluate algorithms 04. Basic techniques for algorithms
	[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: 05. Encode and decode biosystems 06. Gene network 07. Genetic diversity and adaptive evolution 08. Research approaches using biological big data
授業内容 ・方法と 進度予定 /Contents and Class Schedule	[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: 09. Basic technologies for communication networks 10. UAV network 11. Wireless mesh network 12. Device to Device (D2D) network
	[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. 13. Turing Machines: how to program them, why to study them, and how any programmer can benefit from knowing them 14. Post Systems 15. Markov Algorithms
成績評価 方法 /Evaluation Method	Evaluation is performed comprehensively based on exercises during the lecture time, reports, attendance to the lectures, etc. Details will be announced by each professor.
教科書 および 参考書 /Textbook	

and  
references

関連  
URL  
/URL

All the information of this class can be found in Google Classroom. Class code: k2zst6u

授業時間外  
学修  
/Preparation  
and Review

Students are required to thoroughly review the topics covered in class. In addition, professors will provide related topics and keywords for independent study.

その他  
/In addition

更新日付 2023/03/10 20:52

1単位の授業科目は、45時間の学修を必要とする内容をもって構成することを標準としています。1単位の修得に必要な学修時間の目安は、「講義・演習」については15～30時間に授業および授業時間外学修(予習・復習など)30～15時間、「実験、実習及び実技」については30～45時間の授業および授業時間外学修(予習・復習など)15～0時間です。

One-credit courses require 45 hours of study. In lecture and exercise-based classes, one credit consists of 15-30 hours of class time and 30-15 hours of preparation and review outside of class. In laboratory, practical skill classes, one credit consists of 30-45 hours of class time and 15-0 hours of preparation and review outside of class.