Syllabus 2017 Human-Social Information Sciences

Computer Science Fundamentals

Japanese

Basic information

held this year:	yes
instructor(s)	Pandu Rangan Chandrasekaran
room	
schedule	The latter period
begins on:	An intensive lecture

Objectives and outline

Fundamentals of computer science including discrete mathematics,data structure, and algorithm are taught in English. In addition,discussions and problem-solving activity with the lecturer are carried out.

Each day, two sessions of lectures and one session of free discussion.
The topics are (A) Combinatorics and Counting (B) Sets relations, Functions and Partial orders.
In (A) I will discuss basic counting principle, permutations and combinations, bijection and combinatorial proof,
well-ordering principle and pigeonhole principle, generating functions, principles of inclusion and exclusion, applications to discrete probability, analysis of algorithms and basic information theory.
In (B), general properties of sets, axioms, paradoxes, relations, equivalence relations, partial orders, partitions, Dilworth decomposition theorem, closures and transitive closure, etc.
I will workout lots of examples at all levels and even introduce some advanced problem solving.
Among 10 sessions. I will use 7 sessions for Combinatorics and 3 sessions for Sets, Relations and Functions.
In the free discussion hours, I can conduct tutorials and problem solving sessions and workout more problems.
I will do this in an interactive more so that they learn the art of problem solving through discussions and case studies.

Class plan

Evaluation

I will give 5 problem sheets each having two parts. Part I and Part II. All participants must submit solutions
to part I in 48 hours. There are marks for the submitted solutions. For Part II, they must know the solution
but they need not submit the solution.
I will conduct an exam on combinatorics on 4th day, 3rd session. On sets relations etc on 5th day 3rd session.
The combinatorics exam will have questions from class room discussions 40% Part I 40% and Part II 20%.
The sets relations exam will have questions from class room discussions 50% and Part I 50%.
Part I will have simple question that would involve direct application of concepts.
Part II will have slightly advanced problems.

Textbook(s)

Web site

Schedule:
http://www.is.tohoku.ac.jp/media/files/_u/event/file/csf161129.pdf

Office hours

Other information

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