Course Name : Algorithms

Course Detail	Credit / Hour	3 / 45 hours
	Class Time	NA
	Live/Recorded	Recorded
	Language	English
Instructor	Name	Sael Lee
	Email	sael@ajou.ac.kr
	Office hours	NA

1. Introduction

This course deals with principles and techniques for design and analysis of computer algorithms. The topics covered are mathematical induction, asymptotic analysis of algorithm efficiency, and algorithm design techniques including divide-and-conquer, dynamic programming, greedy method, branch-and-bound, backtracking, and iterative improvements. Elements of computational complexity theory, mostly on NP-completeness, is introduced and it is also discussed how to cope with computationally intractable problems.

2. Course Objectives

The goal of this course is to enable students to recognize, analyze, and solve algorithmic problems. At the end of the course, students should be able apply core algorithmic problems that underlie many programming tasks, identify and use appropriate algorithmic techniques to solve those problems, and analyze and compare the performance of algorithmic solutions.

3. Class types and activities

Mostly lectures.

Assignments consist of exercise problems on algorithm efficiency analysis, algorithm designs, and algorithm correctness. Students are supposed to invest considerable amount of time to understand course material and to solve assigment problems.

4. Teaching Method / Support System in Use / Teaching tools

Lecture
Ajou Bb

5. Knowledge and ability required for taking this course

Computer Programming (C++, Java, or Python)
Data Structures

6. Method of Evaluation

Evaluation Item	Evaluation Proportion	Remarks
Final	100 %	

7. Textbook and supplementary material

Main/Sub	Title (Website)	Writer	Publisher	Publication year
Main	Foundations of Algorithms, 5th edition	Richard Neapolitan	Jones & Bartlett	2015
Sub	The Algorithm Design Manual	Steven S. Skiena	Springer	2008

8. Class Schedule

Day	Topic	Remarks
1	Introduction	
2	Analysis of algorithm efficiency	
3	Analysis of algorithm efficiency	
4	Divide-and-Conquer	
5	Divide-and-Conquer	
6	Sorting and Searching	
7	Dynamic Programming	
8	Dynamic Programming	
9	Greedy Approaches	
10	Greedy Approaches	
11	Graph Algorithms	
12	Backtracking	

13	Backtracking	
14	Branch-and-Bound	
15	Intractable Problems/NP-hard Problems	