

## Data Structures and Practice

Course Name	Course type (credit/hours)		Required course(4/5)		Course code	F044
	Target students Division/major/grade		Software and Computer Engineering/Sophomore		Opening semester	2019 1ST SEMESTER
	Class time and classroom		Mon 1(PaI333) Mon 2(PaI333)Wed 10:30~12:00 (PaI309)Fri 10:30~12:00 (PaI309)		English Grade	A(100%English)
Reference to this course	Prerequisite courses		C programming			
	Related basic courses					
	Recommended concurrent courses					
	Related advanced courses					
Instructor	Name (title/division)		PAUL RAJIB(Assistant Professor, Software and Computer Engineering)			
	Office Room Number	팔달관 1011	Office phone Number		e-mail	
	Office hours	by appointment		Homepage address	http://www.kyungsikhan.com/	
Teaching Assistant	Name (title/division)					
	Office Room Number		Office phone Number		e-mail	

### 1. Introduction

This course covers basic data structures and algorithms in Computer Science. Efficient data structures are key for designing efficient algorithms and obtaining maintainable software design. The Internet today provides access to many programs and code fragments. However, by simply using them, you will not learn the fundamental knowledge useful in your career. Through this course, you will be able to understand the data structures and algorithms and know how to apply them to your work as opposed to mechanically copying code fragments.

The course covers the analysis, design, and implementation of data structures including arrays, stacks, queues, linked lists, binary trees, heaps, balanced trees, graphs, sorting, and hashing. Course work involves quizzes and programming assignments.

### 2. Course Objectives

Upon successful completion of this course, you will be able to design and implement Abstract Data Types to write computer programs that use fundamental data structures and algorithms.

### 3. Class types and activities

This course provides lectures and programming exercises. Students will complete weekly or bi-weekly homework assignments.

### 4. Teaching Method

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|--|---|
| <input checked="" type="checkbox"/> lecture                          | <input type="checkbox"/> discussion and debate                    |
| <input type="checkbox"/> team project(presentation and case studies) | <input checked="" type="checkbox"/> experiments(role-playing,etc) |
| <input type="checkbox"/> designing and production                    | <input type="checkbox"/> on-site learning(on-site training)       |
| <input type="checkbox"/> others                                      |   |

### 5. Support Systems in Use

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|--|---|---|
| <input checked="" type="checkbox"/> AjouBb               | <input type="checkbox"/> automatic recording system | <input type="checkbox"/> web-based assignment |
| <input type="checkbox"/> cyber lecture                   | <input type="checkbox"/> online content             |   |
| <input type="checkbox"/> class behavior analyzing system | <input type="checkbox"/> others                     |   |

### 6. Teaching Tools

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|--|---|---|
| <input type="checkbox"/> PBL(Problem Based Learning) | <input type="checkbox"/> CBL(Case Based Learning) | <input type="checkbox"/> TBL(Team Based Learning)           |
| <input type="checkbox"/> UR(Undergraduate Research)  | <input type="checkbox"/> FL(Flipped Learning)     | <input type="checkbox"/> DSAL(Data Science Active Learning) |
| <input type="checkbox"/> others                      |   |   |

### 7. Knowledge and ability required for taking this course

Students are expected to be familiar with C.

## 8. Method of Evaluation

Evaluation Item	The Number of Times	Evaluation Proportion	Remarks
Attendance		5	
midterm exam	1	35	
final exam	1	40	
quiz	8	20	
presentation			
discussion			
homework			
etc			
study hours			

## 9. Textbook and supplementary material

Main/Sub	Title (Web-site)	Writer	Publisher	Publication year
Main	Fundamentals of Data Structures in C, 2nd Edition	Ellis Horowitz, Sartaj Sahni, and Susan Anderson-Freed	Silicon Press	2007

## 10. Class system and Class shedule

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### < Class Schedule >

\* language : K-korean, E-English

Weeks	Topics	language	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
1	Algorithm specification and performance analysis	K/E	PAUL RAJIB			
2	Arrays: polynomial, sparse matrix, string	K/E	PAUL RAJIB			
3	Recursion	K/E	PAUL RAJIB			
4	Stacks and queues	K/E	PAUL RAJIB			

## < Class Schedule >

\* language : K-korean, E-English

Weeks	Topics	language	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
5	Lists: polynomials, sparse matrix	K/E	PAUL RAJIB			
6	Trees: binary trees	K/E	PAUL RAJIB			
7	Mid term	K/E	PAUL RAJIB			
8	Trees: heaps and binary search tree	K/E	PAUL RAJIB			
9	Graphs: search and minimum cost spanning tree	K/E	PAUL RAJIB			
10	Graphs: shortest paths and transitive closure, activity on network	K/E	PAUL RAJIB			
11	Graphs: shortest paths and transitive closure, activity on network	K/E	PAUL RAJIB			
12	Sorting	K/E	PAUL RAJIB			
13	Sorting	K/E	PAUL RAJIB			
14	Hashing	K/E	PAUL RAJIB			
15	Search structures: AVL trees, B-trees, 2-3 trees	K/E	PAUL RAJIB			
16	Final exam	K/E	PAUL RAJIB			

## 11. Other items of notification

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