Extended Syllabus

Course Title	Data Structures	Semester	Spring 2024
Credit	3	Course Number	CSE3080 / AIE3050
Class Time	Tu,Th 12:00-13:15	Enrollment Eligibility	2-4학년

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(업데이트: 24.2.26)
※ 자료구조 추가 수강 허가를 요청하는 메일이 많이 오고 있어서 일일이 답장을 못 할 수 있으니 이해를 부탁드립니다. 자료구조 3분반의 증원은 다음과 같이 할 예정이니, 수강신청에 참고해주시기 바랍니다.
(1) 학번 0, 3, 6, 8번: 이분들은 3분반의 수강인원을 증원할 예정이니 수강신청 변경기간에 수강신청을 하시면 되겠습니다.
(2) 그 외 학번: 7학기 이상이면서, 본인 분반에 다른 필수 교과목이 겹쳐서 들을 수 없는 분은 수강허가서와 시간표(본인 분반이 필수 과목과 겹치는 부분을 표시)를 가지고 오셔서 첫 수업 시간에 제게 제출해주시기 바랍니다. 조교가 검토한 후에 수강 허가를 해 드리겠습니다.

이 두 가지 경우만 하더라도 인원이 매우 많아서 더 이상의 수강 허가는 어려운 점을 이해해 주시기 바랍니다. 해당하지 않는 분들은 1, 2분반으로 수강신청을 해주시거나 다음 학기에 수강해주시면 감사하겠습니다.

Ⅰ. Course Overview

1. Description

The main objective of this course is to learn the design, analysis, implementation, and theory of data structures. Throughout the course we will look at elementary data structures such as lists, stacks, queues, and trees, and how they are implemented using a programming language. Also, we will use these data structures to solve a variety of computational problems and analyze their efficiency.

2. Prerequisites

CSE2035 (C Programming) or equivalent. The students are expected to have some experience in basic C programming.

3. Course Format (%)

Lecture	Discussion	Experiment/Practicum	Field study	Presentations	Other
70%	%	30%	%	%	%

4. Evaluation (%)

mid-term Exam	Final exam	Quizzes	Presentations	Projects	Assignments	Participation	Other
30%	30%	%	%	%	30%	10%	%

Ⅱ. Course Objectives

Knowledge:

(1) Understanding why data structures are important in solving computational problems

(2) Understanding frequently used elementary data structures such as lists, stacks, queues and trees

(3) Understanding how data structures are used in algorithms to solve problems

Skill:

(1) Implementing data structures and algorithms using a programming language (such as C)

(2) Designing efficient algorithms

Attitude:

(1) Designing algorithms and mathematically analyzing their efficiency

(2) Problem solving by designing algorithms and selecting the best data structures

Ⅲ. Course Format

(* In detail)

- Lectures
- Programming assignments
- Supplementary labs may be provided to help students with the assignments

Ⅳ. Course Requirements and Grading Criteria

- Programming assignments will be given based on the theory learned in class.
- The students should use C language to accomplish the given requirements.
- Additional requirements may be given such as documenting the code and writing report documents.

Ⅴ. Course Policies

- Students may not copy others' work. Copying will result in a score of 0.
- For programming assignments, we run a software that evaluates similarity between the codes. If the similarity score is high, the TAs will look at the code and decide whether they are actually copied work or not.

- Discussing ideas with others is encouraged.

VI. Materials and References

- Textbook: Ellis Horowitz et al., Fundamentals of Data Structures in C, 2nd edition, Silicon Press, 2007.
- Supplementary book: Thomas Cormen et al., Introduction to Algorithms, 3rd edition, MIT Press, 2009.

Ⅶ. Course Schedule

(* Subject to change)

Week 1	**Learning Objectives**	intro to data structures
	Topics	course objectives, algorithm specification
	Class Work (Methods)	lecture
	Materials (Required Readings)	chapter 1
	Assignments	Assignments will be announced in class.
Week 2	**Learning Objectives**	intro to data structures
	Topics	data abstraction, complexity
	Class Work (Methods)	lecture
	Materials (Required Readings)	chapter 1
	Assignments	Assignments will be announced in class.
Week 3	**Learning Objectives**	arrays
	Topics	implementing and manipulating arrays
	Class Work (Methods)	lecture
	Materials (Required Readings)	chapter 2
	Assignments	Assignments will be announced in class.

Week 4	**Learning Objectives**	arrays
	Topics	algorithms using arrays
	Class Work (Methods)	lecture
	Materials (Required Readings)	chapter 2
	Assignments	Assignments will be announced in class.
Week 5	**Learning Objectives**	stacks & queues
	Topics	implementing and operating stacks and queues
	Class Work (Methods)	lecture
	Materials (Required Readings)	chapter 3
	Assignments	Assignments will be announced in class.
Week 6	**Learning Objectives**	stacks & queues
	Topics	algorithms using stacks
	Class Work (Methods)	lecture
	Materials (Required Readings)	chapter 3
	Assignments	Assignments will be announced in class.
Week 7	**Learning Objectives**	stacks & queues
	Topics	algorithms using stacks
	Class Work (Methods)	lecture
	Materials (Required Readings)	chapter 3
	Assignments	Assignments will be announced in class.

Week 8	**Learning Objectives**	
	Topics	Midterm exam
	Class Work (Methods)	
	Materials (Required Readings)	
	Assignments	
Week 9	**Learning Objectives**	linked lists
	Topics	implementing linked lists
	Class Work (Methods)	lecture
	Materials (Required Readings)	chapter 4
	Assignments	Assignments will be announced in class.
Week 10	**Learning Objectives**	linked lists
	Topics	problem solving using linked lists
	Class Work (Methods)	lecture
	Materials (Required Readings)	chapter 4
	Assignments	Assignments will be announced in class.
Week 11	**Learning Objectives**	linked lists
	Topics	problem solving using linked lists
	Class Work (Methods)	lecture
	Materials (Required Readings)	chapter 4
	Assignments	Assignments will be announced in class.

Week 12	**Learning Objectives**	trees
	Topics	implementing trees, using binary trees
	Class Work (Methods)	lecture
	Materials (Required Readings)	chapter 5
	Assignments	Assignments will be announced in class.
Week 13	**Learning Objectives**	trees
	Topics	heaps, binary search trees, decision trees
	Class Work (Methods)	lecture
	Materials (Required Readings)	chapter 5
	Assignments	Assignments will be announced in class.
Week 14	**Learning Objectives**	graphs
	Topics	graph representation, graph searching
	Class Work (Methods)	lecture
	Materials (Required Readings)	chapter 6
	Assignments	Assignments will be announced in class.
Week 15	**Learning Objectives**	graphs
	Topics	minimum spanning trees, shortest path algorithms
	Class Work (Methods)	lecture
	Materials (Required Readings)	chapter 6
	Assignments	Assignments will be announced in class.

Week 16	Learning Objectives	
	Topics	Final exam
	Class Work (Methods)	
	Materials (Required Readings)	
	Assignments	

Ⅷ. Special Accommodations

None.

IX. Aid for the Challenged Students

If you need special aid in taking this course, send an email to the instructor.