Tamkang University Academic Year 112, 1st Semester Course Syllabus

Course Title	DATA STRUCTURES	Instructor	YU, KUO-CHUNG
Course Class	TKFXB2A DEPARTMENT OF ARTIFICIAL INTELLIGENCE, 2A	Details	◆ General Course ◆ Required ◆ One Semester
Relevance to SDGs	SDG9 Industry, Innovation, and Infrastructure		

Departmental Aim of Education

Ⅰ. Students may analyze problems in applied science based on the fundamental knowledge of programming, mathematics, and artificial intelligence.

Ⅱ. Students may plan and implement an AI system following the procedures of problem analysis, experiment testing, data visualizing, derivation and deduction.

Ⅲ. Educate the students to be AI engineers who may accomplish their missions indepedently and may collaborate with their colleagues in the workplace.

Ⅳ. Students may have basic skills and global competence for career diversification, and may keep lifelong learning.

Subject Departmental core competences

A. Professional analysis.(ratio:40.00)

B. Practical application.(ratio:30.00)

C. Professional attitude.(ratio:25.00)

D. Global Mobility.(ratio:5.00)

Subject Schoolwide essential virtues

1. A global perspective. (ratio:10.00)

2. Information literacy. (ratio:20.00)

3. A vision for the future. (ratio:10.00)

4. Moral integrity. (ratio:5.00)

5. Independent thinking. (ratio:30.00)

6. A cheerful attitude and healthy lifestyle. (ratio:10.00)

7. A spirit of teamwork and dedication. (ratio:10.00)

8. A sense of aesthetic appreciation. (ratio:5.00)

Course Introduction	This course provides a comprehensive and technically rigorous introduction to data structures such as arrays, stacks, queues, linked lists, trees and graphs and techniques such as sorting hashing that form the basis of all software. In addition, this course presents advanced or specialized data structures such as priority queues, efficient binary search trees, multiway search trees and digital search structures. This course also discusses topics such as weight biased leftist trees, pairing heaps, symmetric minmax heaps, interval heaps, topdown splay trees, B+ trees and suffix trees.

The correspondences between the course's instructional objectives and the cognitive, affective, and psychomotor objectives.

Differentiate the various objective methods among the cognitive, affective and psychomotor domains of the course's instructional objectives.

  I. Cognitive : Emphasis upon the study of various kinds of knowledge in the cognition of
        the course's veracity, conception, procedures, outcomes, etc.
 II.Affective : Emphasis upon the study of various kinds of knowledge in the course's appeal,
        morals, attitude, conviction, values, etc.
 III.Psychomotor: Emphasis upon the study of the course's physical activity and technical
        manipulation.

No.	Teaching Objectives	objective methods
1	Students can understand various kinds of data structure	Cognitive
2	Students can implement and apply data structure during programming	Psychomotor

The correspondences of teaching objectives : core competences, essential virtues, teaching methods, and assessment

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	A	25678	Lecture, Practicum	Testing, Study Assignments, Report(including oral and written)
2	ABCD	12345	Practicum	Testing, Study Assignments, Discussion(including classroom and online)

Course Schedule

Week	Date	Course Contents	Note
1	112/09/11 ~ 112/09/17	Basic Concepts	
2	112/09/18 ~ 112/09/24	Array and Structures	

3	112/09/25 ~ 112/10/01	Stack and Queues	
4	112/10/02 ~ 112/10/08	Linked Lists	
5	112/10/09 ~ 112/10/15	Linked Lists	
6	112/10/16 ~ 112/10/22	Trees	
7	112/10/23 ~ 112/10/29	Trees	
8	112/10/30 ~ 112/11/05	Graphs	
9	112/11/06 ~ 112/11/12	Midterm Exam Week	
10	112/11/13 ~ 112/11/19	Graph	
11	112/11/20 ~ 112/11/26	Sorting	
12	112/11/27 ~ 112/12/03	Sorting	
13	112/12/04 ~ 112/12/10	Hashing	
14	112/12/11 ~ 112/12/17	Priority Queues	
15	112/12/18 ~ 112/12/24	Efficient Binary Search Trees	
16	112/12/25 ~ 112/12/31	Multiway Search Trees	
17	113/01/01 ~ 113/01/07	Final Exam Week	
18	113/01/08 ~ 113/01/14	Tree, Graph, and Sorting Review	

Key capabilities	
Interdisciplinary	
Distinctive teaching	
Course Content	Computer programming or Computer language (students have hands-on experience in related projects)

Requirement	
Textbooks and Teaching Materials	Self-made teaching materials:Presentations Using teaching materials from other writers:Textbooks Name of teaching materials: Fundamentals of Data Structures in C 2nd Edition, Horowitz, Sahni, and Anderson-Freed, 開發圖書
References	無
Grading Policy	◆ Attendance： 5.0 % ◆ Mark of Usual：25.0 % ◆ Midterm Exam： 25.0 % ◆ Final Exam： 25.0 % ◆ Other〈實習課〉：20.0 %
Note	This syllabus may be uploaded at the website of Course Syllabus Management System at http://info.ais.tku.edu.tw/csp or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at http://www.acad.tku.edu.tw/CS/main.php . ※ **Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.**