# Tamkang University Academic Year 111, 2nd Semester Course Syllabus

| Course Title | DATA STRUCTURES | Instructor | KAO CHIUN HOW |
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| Course Class | TLSAM1A<br>MASTER'S PROGRAM IN DATA SCIENCE,<br>DEPARTMENT OF STATISTICS, 1A | Details | ◆ General Course<br>◆ Selective<br>◆ One Semester |
| Relevance to SDGs | SDG4  Quality education<br>SDG9  Industry, Innovation, and Infrastructure | | |

## Departmental Aim of Education

Cultivate cross-field data science analyst who integrate statistics and information science to provide effective decision-making methods and strategies in different professional fields, thereby creating the greatest application value of data.

## Subject Departmental core competences

A. Data analysis ability.(ratio:30.00)

B. Information application ability.(ratio:30.00)

C. Logical reasoning ability.(ratio:20.00)

D. Ability to integrate knowledge in various fields.(ratio:20.00)

## Subject Schoolwide essential virtues

1. A global perspective. (ratio:15.00)

2. Information literacy. (ratio:30.00)

3. A vision for the future. (ratio:5.00)

4. Moral integrity. (ratio:5.00)

5. Independent thinking. (ratio:15.00)

6. A cheerful attitude and healthy lifestyle. (ratio:5.00)

7. A spirit of teamwork and dedication. (ratio:20.00)

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

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| Course Introduction | This course offers a study of data structures, including stacks, recursion, queues, lists, trees, graphs, sorting and searching. Students taken this course can understand the data structure and designing logic in the developed programs or softwares. |

**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 | To understand stacks, recursion, queues and link lists. | Cognitive |
| 2 | To understand the advanced data structures as trees and graphs. | Cognitive |
| 3 | To understand the sorting and searching algorithms. | Cognitive |

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

| No. | Core Competences | Essential Virtues | Teaching Methods | Assessment |
|---|---|---|---|---|
| 1 | ABCD | 12345678 | Lecture | Testing, Study Assignments |
| 2 | ABCD | 12345678 | Lecture | Testing, Study Assignments |
| 3 | ABCD | 12345678 | Lecture | Testing, Study Assignments |

Course Schedule

| Week | Date | Course Contents | Note |
|---|---|---|---|
| 1 | 112/02/13 ~ 112/02/19 | Introduction | |
| 2 | 112/02/20 ~ 112/02/26 | Preliminaries & Basic Concepts | |

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| 3 | 112/02/27～112/03/05 | Complexity and Performance | |
| 4 | 112/03/06～112/03/12 | Linked Lists | |
| 5 | 112/03/13～112/03/19 | Linked Lists | |
| 6 | 112/03/20～112/03/26 | Linked Lists | |
| 7 | 112/03/27～112/04/02 | Trees | |
| 8 | 112/04/03～112/04/09 | Trees | |
| 9 | 112/04/10～112/04/16 | Trees | |
| 10 | 112/04/17～112/04/23 | Midterm Exam Week | |
| 11 | 112/04/24～112/04/30 | Graphs | |
| 12 | 112/05/01～112/05/07 | Graphs | |
| 13 | 112/05/08～112/05/14 | Graphs | |
| 14 | 112/05/15～112/05/21 | Sorting | |
| 15 | 112/05/22～112/05/28 | Sorting | |
| 16 | 112/05/29～112/06/04 | Searching | |
| 17 | 112/06/05～112/06/11 | Searching | |
| 18 | 112/06/12～112/06/18 | Final Exam Week | |

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| Requirement | |
| Teaching Facility | Computer, Projector |
| Textbooks and Teaching Materials | |
| References | Fundamentals of Data Structures in C, Horowitz, 松崗代理 Data Structure & Algorithm in Java, Fifth Edition, Michaei T. Goodrich, 新月代理 |
| Number of Assignment(s) | 2　　(Filled in by assignment instructor only) |
| Grading Policy | ◆ Attendance： 10.0 %　◆ Mark of Usual：20.0 %　◆ Midterm Exam： 30.0 %<br>◆ Final Exam： 40.0 %<br>◆ Other〈　〉：　　% |

| 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 . |
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