

## Tamkang University Academic Year 109, 2nd Semester Course Syllabus

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|--|---|------------|--|
| Course Title   | ALGORITHMS  | Instructor | FU-YI HUNG   |
| Course Class   | TQICB2A<br>DIVISION OF SOFTWARE ENGINEERING,<br>DEPARTMENT OF INNOVATIVE INFORMATION<br>AND TECHNOLOGY (ENGLISH-TAUGHT<br>PROGRAM), 2A  | Details    | <ul style="list-style-type: none"> <li>◆ General Course</li> <li>◆ Required</li> <li>◆ One Semester</li> </ul> |
| Relevance to SDGs  | SDG9 Industry, Innovation, and Infrastructure   |            |  |
| <b>Departmental Aim of Education</b>   |   |            |  |
| Cultivate professional talents in developing and applying information system in various fields.  |   |            |  |
| <b>Subject Departmental core competences</b>   |   |            |  |
| A. Capability of computer program coding, process planning, and problem solving(ratio:100.00)  |   |            |  |
| <b>Subject Schoolwide essential virtues</b>  |   |            |  |
| 2. Information literacy. (ratio:70.00)<br><br>5. Independent thinking. (ratio:10.00)<br><br>7. A spirit of teamwork and dedication. (ratio:10.00)<br><br>8. A sense of aesthetic appreciation. (ratio:10.00) |   |            |  |
| <b>Course Introduction</b>   | This course provides an introduction to the design and analysis of algorithms.<br>Course topics include: Fundamentals of the Analysis of Algorithm Efficiency, Divide-and-Conquer, Decrease-and-Conquer, Transform-and-Conquer, Space and Time Tradeoffs, Dynamic Programming, Greedy Technique, Iterative Improvement. |            |  |
|  |   |            |  |

**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 the fundamental properties of algorithms                 | Cognitive         |
| 2   | To implement algorithms to solve practical problems by software design | Cognitive         |
| 3   | To analyze the efficiency of algorithms                                | Cognitive         |

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

| No. | Core Competences | Essential Virtues | Teaching Methods | Assessment |
|-----|------------------|-------------------|------------------|------------|
| 1   | A                | 2578              | Lecture          | Testing    |
| 2   | A                | 2578              | Lecture          | Testing    |
| 3   | A                | 2578              | Lecture          | Testing    |

**Course Schedule**

| Week | Date                     | Course Contents                                      | Note |
|------|--------------------------|--|------|
| 1    | 110/02/22 ~<br>110/02/28 | Introduction   |      |
| 2    | 110/03/01 ~<br>110/03/07 | Fundamentals of the Analysis of Algorithm Efficiency |      |
| 3    | 110/03/08 ~<br>110/03/14 | Fundamentals of the Analysis of Algorithm Efficiency |      |
| 4    | 110/03/15 ~<br>110/03/21 | Fundamentals of the Analysis of Algorithm Efficiency |      |
| 5    | 110/03/22 ~<br>110/03/28 | Brute Force  |      |
| 6    | 110/03/29 ~<br>110/04/04 | Brute Force  |      |
| 7    | 110/04/05 ~<br>110/04/11 | Divide-and-Conquer                                   |      |
| 8    | 110/04/12 ~<br>110/04/18 | Divide-and-Conquer                                   |      |
| 9    | 110/04/19 ~<br>110/04/25 | Divide-and-Conquer                                   |      |

|                                  |  |                       |  |
|----------------------------------|--|-----------------------|--|
| 10                               | 110/04/26 ~<br>110/05/02   | Midterm Exam Week     |  |
| 11                               | 110/05/03 ~<br>110/05/09   | Decrease-and-Conquer  |  |
| 12                               | 110/05/10 ~<br>110/05/16   | Transform-and-Conquer |  |
| 13                               | 110/05/17 ~<br>110/05/23   | Transform-and-Conquer |  |
| 14                               | 110/05/24 ~<br>110/05/30   | Dynamic Programming   |  |
| 15                               | 110/05/31 ~<br>110/06/06   | Dynamic Programming   |  |
| 16                               | 110/06/07 ~<br>110/06/13   | Greedy Technique      |  |
| 17                               | 110/06/14 ~<br>110/06/20   | Greedy Technique      |  |
| 18                               | 110/06/21 ~<br>110/06/27   | Final Exam Week       |  |
| Requirement                      | Cheating or plagiarism will result in a failing grade in the course.<br>作弊或抄襲者學期成績為零分，並且依照校規懲處。  |                       |  |
| Teaching Facility                | Computer, Projector  |                       |  |
| Textbooks and Teaching Materials | Introduction to the Design and Analysis of Algorithms, by Anany V. Levitin, Pearson Education Inc., 2nd Edition, 2007  |                       |  |
| References                       | Introduction to Algorithms, by T. H. Cormen, C. E. Leiserson, R. L. Rivest and C. Stein, McGraw-Hill, 3rd edition, 2009  |                       |  |
| Number of Assignment(s)          | (Filled in by assignment instructor only)  |                       |  |
| Grading Policy                   | ◆ Attendance :            %    ◆ Mark of Usual : 40.0 %    ◆ Midterm Exam : 30.0 %<br>◆ Final Exam :    30.0 %<br>◆ Other <   > :            %   |                       |  |
| Note                             | This syllabus may be uploaded at the website of Course Syllabus Management System at <a href="http://info.ais.tku.edu.tw/csp">http://info.ais.tku.edu.tw/csp</a> or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at <a href="http://www.acad.tku.edu.tw/CS/main.php">http://www.acad.tku.edu.tw/CS/main.php</a> .<br><b>※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</b> |                       |  |