

## Tamkang University Academic Year 104, 2nd Semester Course Syllabus

Course Title	ALGORITHMS	Instructor	FU-YI HUNG
Course Class	TQIDB2A DIVISION OF APPLIED INFORMATICS, DEPARTMENT OF INNOVATIVE INFORMATION AND TECHNOLOGY (ENGLISH- TAUGHT PROGRAM), 2A	Details	<ul style="list-style-type: none"> <li>◆ Required</li> <li>◆ One Semester</li> <li>◆ 3 Credits</li> </ul>
Departmental Aim of Education			
Cultivate professional talents in developing and applying information system in various fields.			
Departmental core competences			
<ul style="list-style-type: none"> <li>A. Capability of computer program coding, process planning, and problem solving</li> <li>B. Capability of applying basic mathematics and information technology related mathematics</li> <li>C. Capability of applying knowledge of internet structure and protocol in communication system</li> <li>D. Capability of developing information system</li> <li>E. Capability of integrating information system</li> </ul>			
Course Introduction	<p>This course provides an introduction to the design and analysis of algorithms. 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.</p>		

**The Relevance among Teaching Objectives, Objective Levels and Departmental core competences**

I. Objective Levels (select applicable ones) :

- (i) Cognitive Domain : C1-Remembering, C2-Understanding, C3-Applying,  
C4-Analyzing, C5-Evaluating, C6-Creating
- (ii) Psychomotor Domain : P1-Imitation, P2-Mechanism, P3-Independent Operation,  
P4-Linked Operation, P5-Automation, P6-Origination
- (iii) Affective Domain : A1-Receiving, A2-Responding, A3-Valuing,  
A4-Organizing, A5-Characterizing, A6-Implementing

II. The Relevance among Teaching Objectives, Objective Levels and Departmental core competences :

- (i) Determine the objective level(s) in any one of the three learning domains (cognitive, psychomotor, and affective) corresponding to the teaching objective. Each objective should correspond to the objective level(s) of ONLY ONE of the three domains.
- (ii) If more than one objective levels are applicable for each learning domain, select the highest one only. (For example, if the objective levels for Cognitive Domain include C3, C5, and C6, select C6 only and fill it in the boxes below. The same rule applies to Psychomotor Domain and Affective Domain.)
- (iii) Determine the Departmental core competences that correspond to each teaching objective. Each objective may correspond to one or more Departmental core competences at a time. (For example, if one objective corresponds to three Departmental core competences: A, AD, and BEF, list all of the three in the box.)

No.	Teaching Objectives	Relevance	
		Objective Levels	Departmental core competences
1	To understand the fundamental properties of algorithms	C2	A
2	To implement algorithms to solve practical problems by software design	C3	A
3	To analyze the efficiency of algorithms	C4	A

**Teaching Objectives, Teaching Methods and Assessment**

No.	Teaching Objectives	Teaching Methods	Assessment
1	To understand the fundamental properties of algorithms	Lecture	Written test
2	To implement algorithms to solve practical problems by software design	Lecture	Written test
3	To analyze the efficiency of algorithms	Lecture	Written test

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This course has been designed to cultivate the following essential qualities in TKU students

Essential Qualities of TKU Students	Description
◇ A global perspective	Helping students develop a broader perspective from which to understand international affairs and global development.
◇ Information literacy	Becoming adept at using information technology and learning the proper way to process information.
◆ A vision for the future	Understanding self-growth, social change, and technological development so as to gain the skills necessary to bring about one's future vision.
◇ Moral integrity	Learning how to interact with others, practicing empathy and caring for others, and constructing moral principles with which to solve ethical problems.
◆ Independent thinking	Encouraging students to keenly observe and seek out the source of their problems, and to think logically and critically.
◇ A cheerful attitude and healthy lifestyle	Raising an awareness of the fine balance between one's body and soul and the environment; helping students live a meaningful life.
◇ A spirit of teamwork and dedication	Improving one's ability to communicate and cooperate so as to integrate resources, collaborate with others, and solve problems.
◇ A sense of aesthetic appreciation	Equipping students with the ability to sense and appreciate aesthetic beauty, to express themselves clearly, and to enjoy the creative process.

#### Course Schedule

Week	Date	Subject/Topics	Note
1	105/02/15 ~ 105/02/21	Introduction	
2	105/02/22 ~ 105/02/28	Fundamentals of the Analysis of Algorithm Efficiency	
3	105/02/29 ~ 105/03/06	Fundamentals of the Analysis of Algorithm Efficiency	
4	105/03/07 ~ 105/03/13	Fundamentals of the Analysis of Algorithm Efficiency	
5	105/03/14 ~ 105/03/20	Brute Force	
6	105/03/21 ~ 105/03/27	Brute Force	
7	105/03/28 ~ 105/04/03	Divide-and-Conquer	
8	105/04/04 ~ 105/04/10	Divide-and-Conquer	
9	105/04/11 ~ 105/04/17	Decrease-and-Conquer	
10	105/04/18 ~ 105/04/24	Midterm Exam Week	
11	105/04/25 ~ 105/05/01	Decrease-and-Conquer	
12	105/05/02 ~ 105/05/08	Transform-and-Conquer	

13	105/05/09 ~ 105/05/15	Transform-and-Conquer	
14	105/05/16 ~ 105/05/22	Dynamic Programming	
15	105/05/23 ~ 105/05/29	Dynamic Programming	
16	105/05/30 ~ 105/06/05	Greedy Technique	
17	105/06/06 ~ 105/06/12	Greedy Technique	
18	105/06/13 ~ 105/06/19	Final Exam Week	
Requirement	Cheating or plagiarism will result in a failing grade in the course. 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		
Textbook(s)	Introduction to the Design and Analysis of Algorithms, by Anany V. Levitin, Pearson Education Inc., 2nd Edition, 2007		
Reference(s)	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 : 30.0 %    ◆ Midterm Exam : 35.0 % ◆ Final Exam :    35.0 % ◆ 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> . <b>※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</b>		