

## Tamkang University Academic Year 108, 1st Semester Course Syllabus

Course Title	ADVANCED COMPUTER ALGORITHMS	Instructor	LIN HWEI-JEN
Course Class	TEIBM1A MASTER'S PROGRAM, DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION ENGINEERING (ENGLISH- TAUGHT PROGRAM), 1A	Details	<ul style="list-style-type: none"> <li>◆ General Course</li> <li>◆ Required</li> <li>◆ One Semester</li> </ul>
Departmental Aim of Education			
I. Cultivate the ability to conduct independent research and problem solving. II. Strengthen creativity and research capacity. III. Build profound professional knowledge in computer science and information engineering. IV. Engage in self-directed lifelong learning.			
Subject Departmental core competences			
A. Independent problem solving ability.(ratio:10.00) B. Independent innovative thinking ability.(ratio:10.00) D. Research & development (R&D) ability in information engineering.(ratio:80.00)			
Subject Schoolwide essential virtues			
2. Information literacy. (ratio:100.00)			
Course Introduction	This course teaches techniques for the design and analysis of efficient algorithms, emphasizing methods useful in practice. Topics covered include: asymptotic notation; sorting; search trees, heaps, and hashing; divide-and-conquer; dynamic programming; greedy algorithms; and graph algorithms.		

**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	1. Students will understand the content and concept of Algorithms.	Cognitive
2	2. Students will learn how to develop fundamental skills in designing and analyzing algorithms	Cognitive
3	3. Students will learn how to synthesize efficient algorithms in common engineering design situations.	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	AD	2	Lecture	Testing, Study Assignments
2	A	2	Lecture	Testing, Study Assignments
3	A	2	Lecture	Testing, Study Assignments

**Course Schedule**

Week	Date	Course Contents	Note
1	108/09/09 ~ 108/09/15	Introduction	
2	108/09/16 ~ 108/09/22	Insertion sort, Running time	
3	108/09/23 ~ 108/09/29	Growth of functions	
4	108/09/30 ~ 108/10/06	Divide-and-Conquer	
5	108/10/07 ~ 108/10/13	Probabilistic Analysis and Randomized Algorithms	
6	108/10/14 ~ 108/10/20	Heapsort	
7	108/10/21 ~ 108/10/27	Quicksort	
8	108/10/28 ~ 108/11/03	Sorting in Linear Time	

9	108/11/04 ~ 108/11/10	Review	
10	108/11/11 ~ 108/11/17	Midterm Exam Week	
11	108/11/18 ~ 108/11/24	Median and Order Statistics	
12	108/11/25 ~ 108/12/01	Hash Tables	
13	108/12/02 ~ 108/12/08	Binary Search Trees	
14	108/12/09 ~ 108/12/15	Red-Black Trees	
15	108/12/16 ~ 108/12/22	Augmenting Data Structures	
16	108/12/23 ~ 108/12/29	Dynamic Programming	
17	108/12/30 ~ 109/01/05	Review	
18	109/01/06 ~ 109/01/12	Final Exam Week	
Requirement	Cell phones must be turned off in class. Using a notebook in class is not allowed.		
Teaching Facility	Computer, Projector		
Textbooks and Teaching Materials	"Introduction to Algorithms" (3rd.) by Thomas Cormen		
References			
Number of Assignment(s)	8 (Filled in by assignment instructor only)		
Grading Policy	◆ Attendance : 5.0 %   ◆ Mark of Usual : 20.0 %   ◆ Midterm Exam : 30.0 % ◆ Final Exam : 30.0 % ◆ Other 〈Homework〉 : 15.0 %		
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>		