Kainan University Department of __Information Management__

Syllabus for _Algorithms_____ _____

semester fall   year 2007

Course Code No.	Course Title	Instructor	Subject	Level of Course	Credits	Hours per Week
201032900 20040010	Chinese:演算法 English:Algorithms	Tsung Dow Huang	☐ required ☑ elective	Year: 3, 4 Class:	3	3
	Course Prerequisites		Programming Design (201010300, 201010301-201010302), Data Structures(201021600)			

Teaching Goals and Content	This course is designed to introduce the concept and analysis of algorithms for the students of MIS major. This is a whole English course, instruction and the text will be in English, the exercises and examines will be in English however some limited Chinese explanation will be provided to help students who have difficulty.
Teaching Methods	✔ lectures ☐ practical training ☐ discussion ☐ question-and-answer ☐ other (details _____)
Grading and Evaluation Criteria	midterm ___30_% final ____30_% class participation ____20_% other ___20__% (details _Homework and projects_)
Textbooks	(author, title, edition, publisher, place of publication, year of publication, pages covered)
	Text book Title-Introduction to the design and analysis of algorithms 2nd Edition Author-Anany Levitin Publisher Pearson International Edition

Course Description (including outline and course schedule):

Algorithm

Text: Title-Introduction to the design and analysis of algorithms

    2nd Edition

    Author-Anany Levitin

    Publisher Pearson International Edition

This course is designed to introduce the concept and analysis of algorithms for the students of MIS major.   This is a whole English course, instruction and the text will be in English, the exercises and examines will be in English however some limited Chinese explanation will be provided to help students who have difficulty.   We will cover the following topics:

(1).   Fundamentals of algorithmic problem-solving, problem types and important data structures(Week 1).

(2).   Fundamentals of algorithm analysis, analysis framework, order of growth, asymptotic notations, recursive and non-recursive algorithms, Fibonacci numbers(Week 2).

(3).   Brute force, bubble sort, sequential search, exhaustive search(Week 3),

(4).   Divide-and-conquer, merge sort, quick sort, binary sort, binary tree traversals(Week 4, 5).

(5).   Decrease-and-conquer, insert sort, generating combinatorial objects(Week 6, 7).

Mid-term Examination

(6).   Transform-and-conquer, Gaussian elimination, balanced search tree, heaps and heap sort, Honer's rule(Week 8).

(7).   Space and time tradeoff, hashing, B-tree(Week 9).

(8).   Dynamic programming, computing a binomial coefficient, Warshall's and Floyd's algorithm, knapsack problem(Week 10).

(9).   Greedy Technique, Prim's algorithm, Kruskal's algorithm, Dijkstra's algorithm, Huffman tree(Week 11,12).

(10).   Limitation of algorithm power, lower bound arguments, decision tree, P, NP, NP complete problems(Week 13).

(11).   Coping with the limitations of algorithm power, backtracking, branch-and-bound, approximation algorithm for NP-hard problems(Week 14)

(12).   Genetic algorithms – an introduction(Week 15)

Project Due and Final Examination

Grading policy

    Mid-term ----30%

    Final term ----30%

    Homework ---20%

    ther ----------20%

Instructions:

1.   Teachers should fill out this form before the semester begins. After it has been verified by the curriculum committee, the original should be given to the office of curriculum planning and a copy to the head of the department to which the course belongs. In addition, the teacher should explain this syllabus to students at the beginning of a semester.

2.   This form was approved by the curriculum committee on April 23, 2002.

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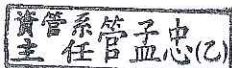
signature of the convener of the curriculum committee   signature of the teacher