

Course Information and Syllabus

The goal of this course is to acquaint the students with basic computer algorithms and their design principles and to cultivate the students' ability in designing and analyzing algorithms independently.

Instructor: Yih-Kuen Tsay (蔡益坤), NTU IM Dept., 3366-1189, tsay@im.ntu.edu.tw

Lectures: Monday 2:20–5:20PM, Room 102, Management II

Office Hours: Wednesday 1:30–2:30PM or by appointment, Room 1108, Management II

Textbooks:

1. *Introduction to Algorithms – A Creative Approach*, U. Manber, Addison-Wesley, 1989. [M]
2. *Introduction to Algorithms, Third Edition*, T.H. Cormen, C.E. Leiserson, R.L. Rivest, and C. Stein, MIT Press, 2009. [C]

Syllabus/Schedule: This course provides an introduction to the design and analysis of computer algorithms. A particular emphasis is given to **principles of mathematical induction** and their use in designing algorithms. The course will cover most of Manber's book plus supplementary material, including a few chapters of the book by Cormen *et al.*:

- Introduction [M: Ch. 1; C: Ch. 1,2] (.5 week: 2/22a)
- Mathematical Induction [M: Ch. 2; C: Ch. 4] (1.5 weeks: 2/22b, 3/1)
- Analysis of Algorithms [M: Ch. 3; C: Ch. 2,3,4] (1 week: 3/8)
- Design by Induction [M: Ch. 5] (2 weeks: 3/15, 3/22)
- Data Structures: A Supplement [M: Ch. 4; C: Ch. 6,13,21] (1 week: 3/29)
- Searching and Sorting [M: Ch. 6; C: Ch. 6,7,8,9] (1.5 weeks: 4/12, 4/26a)
- String Processing [M: Ch. 6; C: Ch. 32] (1.5 weeks: 4/26b, 5/3)
- Graph Algorithms [M: Ch. 7; C: Ch. 22,23,24,25,26] (3 weeks: 5/10, 5/17, 5/24)
- Selected Topics: Dynamic Programming and Mergeable Heaps [C: Ch. 15,19] (1 week: 5/31)
- NP-Completeness [M: Ch. 11; C: Ch. 34] (2 weeks: 6/7, 6/14)

Web Site: <http://im.ntu.edu.tw/~tsay/courses/algorithms/>

Grading: Homework 20%, Participation 10%, Midterm (4/19) 35%, Final (6/21) 35%

TA: Yi-Wen Chang (常怡文), 3366-1205, wen.firefly@gmail.com; Jen-Feng Shih (施任峰), 3366-1205, r98725050@ntu.edu.tw. TA sessions will be scheduled prior to some of the class meetings (tentatively on 3/22, 4/12, 5/17, and 6/7), between 1:20 and 2:10PM.