

## ALGORITHMS

**Course#:** EE4033; 901/39000. **Class#:** 02.

**Time/Location:** Thursdays 14:20~17:10/EEII-146.

**Instructor:** Iris Hui-Ru Jiang (huirujiang@ntu.edu.tw).

**URL:** [https://ceiba.ntu.edu.tw/1061EE4033\\_02](https://ceiba.ntu.edu.tw/1061EE4033_02).

**Office:** BL-629. Tel: 3366-4690.

**Office Hours:** Thursdays 13:30~14:00; other times by appointment.

**Teaching Assistant:** Yu-Sheng Lu (yslu@eda.ee.ntu.edu.tw); BL-406; Tel: 33663700 # 6406; Office Hours: Mondays 13:30~14:30.

**Prerequisites:** Two out of the following four courses: 1) Data structures, 2) Discrete mathematics, 3) Computer programming in C, 4) Computer programming in C++. (**C/C++ programming skill is a must.**)

**Required Text:** J. Kleinberg and E. Tardos, Algorithm Design, Addison Wesley, 2006 (Cornell)

**Reference Books:**

- S. Dasgupta, C. H. Papadimitriou, and U. V. Vazirani, Algorithms, McGraw-Hill, 2007 (UC Berkeley)
- T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, Introduction to Algorithms, 3rd Ed., McGraw Hill/MIT Press, 2009 (Bible! MIT)

**Course Objectives:** 1) Study unifying principles and concepts of algorithm design. 2) Polish your critical thinking and problem-solving technique.

**Course Contents:** Topics include

- Overview and Introduction (4 hrs)
- Basics of algorithm analysis (3 hrs)
- Graphs (6 hrs)
- Greedy algorithms (7 hrs)
- Divide and conquer (4 hrs)
- Dynamic programming (6 hrs)
- Network flow (3 hrs)
- NP completeness (3 hrs)
- Amortized analysis (3 hrs)
- Linear programming (3 hrs)
- Advanced topics (6 hrs)

**Grading:**

- Homework assignments: 10%
- Projects (two mini-projects: 20% + term project (presentation and program due January 11): 20%)
- Two in-class tests (Midterm on November 16: 25% + Final on January 4: 25%)
- Adjustment: +-5% for each item

**Attention:** The grades on homework, projects, and tests are considered final **one week** after they have been handed back, so you should bring any questions to the grader's attention promptly. The final grade is not negotiable except instructor's mistakes.

**Homework:** Students may discuss the homework problems with one another but must write up their solutions separately. Homework must be handed in at the **beginning** of the class on which it is due. Late homework will not be accepted afterwards.

**Project:** All submissions of mini-projects and term project will be subject to duplication checking; those with  $\geq 40\%$  similarity will be penalized. Late submission will incur a penalty of 1/86400 of the total score per second after the deadline (the penalty will be computed based on the submission time).

Term project requires students to form 2-person teams, give presentations and submit programs on January 4; a 1-page project proposal is due on November 9.

**On-Line Resources:** Lecture notes, homeworks/tests, grading information, and other course-related materials are available at NTU CEIBA [https://ceiba.ntu.edu.tw/1061EE4033\\_02](https://ceiba.ntu.edu.tw/1061EE4033_02).

**Academic Honesty:** Plagiarism is strongly prohibited. Oral discussion about homework is not considered cheating. Copying someone else's homework/test or part of a homework/test is cheating. When cheating is discovered, all students involved will receive no credit for the homework/test, possibly an F grade for the course.