

COMP4030/6030: Design and Analysis of Algorithms – Spring 2017
Instructor: Dr. Vinhthuy Phan (vphan@memphis.edu, 678-1535)

Time: TR 9:40AM – 11:05AM

Location: Dunn Hall 119

Office Hours: Monday 10AM or by appointment, Dunn Hall 309

Description: the course introduces fundamental algorithms design techniques such as divide and conquer, dynamic programming, greedy. **Prerequisite:** COMP 2700

Learning Outcomes:

- Demonstrate an ability to break down a problem into smaller components.
- Demonstrate an ability to identify techniques and models to achieve the solution.
- Demonstrate an ability to evaluate different implementations with respect to running time and memory usage.

Recommended textbooks:

- “Algorithms”, by Dasgupta and Papadimitriou (PDF is available for free online)
- “Foundations of Algorithms”, by Neapolitan, 5th edition.
- “Introduction to the Design and Analysis of Algorithms”, by Levitin, 3rd edition.
- “Algorithm Design”, by Kleinberg and Tardos

Evaluation:	4030	6030	
In-class exercises	5%	5%	(determined by brownies points)
Assignment	15%	15%	
Exams	85%	85%	(best 3 out of 4 exams)

Topics:

1. Basic techniques
 - a. Correctness of algorithms
 - b. Analysis of running time
2. Self reduction techniques
 - a. Divide/decrease and conquer
 - b. Dynamic programming
 - c. Greedy
 - d. Backtracking
 - e. Branch and bound
3. Transformation techniques
 - a. Lower bound of comparison-based sorting
 - b. Linear programming
 - c. NP-hardness

Exams: there will be 4 exams (including the final exam, which will be on Thursday, May 2, 10:30AM – 12:30PM)

Plagiarism or cheating behavior in any form is unethical and detrimental to proper education and **will not be tolerated**. All work submitted by a student (projects, programming assignments, lab assignments, quizzes, tests, etc.) is expected to be a student's own work. The plagiarism is incurred when any part of anybody else's work is passed as your own (no proper credit is listed to the sources in your own work) so the reader is led to believe it is therefore your own effort. Students are allowed and encouraged to discuss with each other and look up resources in the literature (including the internet) on their assignments, but **appropriate references must be included for the materials consulted**, and appropriate citations made when the material is taken verbatim.

If plagiarism or cheating occurs, the student will receive a failing grade on the assignment and (at the instructor's discretion) a failing grade in the course. The course instructor may also decide to forward the incident to the University Judicial Affairs Office for further disciplinary action. For further information on U of M code of student conduct and academic discipline procedures, please refer to: <http://www.people.memphis.edu/~jaffairs/>