COMP4030/6030: Design and Analysis of Algorithms – Fall 2019
Instructor: Dr. Vinhthuy Phan (vphan@memphis.edu, 678-1535)

Time: TR 9:40AM – 11:05AM

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

Description: Asymptotic behavior of programs, basic paradigms in algorithm design; greedy, divide-andconquer, dynamic programming; analysis of efficiency and optimality of representative algorithms, including graph, pattern matching, numerical, randomized, and approximation algorithms; approaches to lower bound analysis; basic parallel algorithms.
PREREQUISITE: COMP 2700, or permission of instructor.

Course Outcomes:
1. Analyze and identify the running time of iterative functions.
2. Analyze and identify the running time of recursive functions.
3. Design and evaluate algorithms using the divide and conquer strategy on linear data structures.
4. Design and evaluate algorithms using the divide and conquer strategy on tree-like structures.
5. Design solutions to store repeated computation to improve the running time efficiency of algorithms.
6. Design solutions to enumerate all possible candidates to select the correct solution.

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.

Grading

	COMP 4030	**COMP 6030**
Assignments	25% (*)	25%
Exam 1	25%	25%
Exam 2	25%	25%
Exam 3	25%	25%

(*) Lowest score among assignments is dropped.

Topics:
1. **Correctness of algorithms**
2. **Analysis of running time**
3. **Divide/decrease and conquer**
4. **Dynamic programming**
5. **Greedy**
6. **Backtracking**
7. **Branch and bound**
8. **Graph algorithms**
9. **NP-hardness**

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/**