

COMP 7713/8713: Advanced Topics in Algorithms

Instructor: Vinhthuy Phan

Time: 9:10AM - 10:10AM. Location: PSY 230.

Description: selected topics in algorithms including NP-completeness, approximation algorithms and randomized algorithms. Prerequisite: COMP 7712.

References:

- (WS) “The Design of Approximation Algorithms”, by Williamson and Schmoys, 2011.
- (DPV) “Algorithms”, by Dasgupta, Papadimitriou and Varizani, 2006.
- (JS) “Algorithms”, by Johnsonbaugh and Schaefer, 2003.

Topics:

Topic	Reading
Induction. Running time complexity and the Master’s theorem. Technique I: self reduction. Technique II: transformation, LP Complexity hierarchy: P, NP, NP Completeness Coping with NP completeness Approximating Set Cover Deterministic rounding Random sampling and randomized rounding of linear programs Randomized rounding of semidefinite programs The Primal-Dual method	DPV 7 DPV 8. JS 10.1-10.4 DPV 9.1-9.2. JS 11.1-11.4 WS 1 WS 4.1-4.4 WS 5.1-5.6 WS 6.1-6.2 WS 7.1-7.5

Grading:

	COMP 7713	COMP 8713
Midterm & Final exams	40%	40%
Assignment	30%	30%
Scribing	20%	20%
Participation	15%	5%
Leading discussion		10%