CSCE 5283, Graph and Combinatorial Algorithms

Catalog Description:
A study of algorithms for graphs and combinatorics with special attention to computer implementation and runtime efficiency. Prerequisite: Graduate standing or instructor consent.

Additional and Orthogonal Subjects: Basic graph theory (terminology and definition, classification, property), basic computational complexity theory (NP-completeness, NP-hardness, problem reduction), algorithm design and analysis techniques (divide and conquer, greedy, dynamic programming, network flow, linear programming, branch and bound, backtracking, heuristics, time and space complexities), and applications.

Textbook:
Graph Algorithms
Shimon Even Edited by Guy Even

Reference Book:
Graph Theory and its Applications2nd edition.
Jonathan L. Gross and Jay Yallen

Course learning outcomes: The objectives of the course are to introduce basic graph theory, computational complexity theory, graph algorithms and their applications, and combinatorial optimization. The ability to formulate problems precisely, to model problems using graphs, to develop algorithms that are needed at a high level of abstraction, the ability to devise alternative implementations of an algorithm, and the ability to synthesize a correct algorithm and to analyze its computational complexity are emphasized.

Prerequisites:
1. Fundamental programming language concepts and skills and the ability to program a high level programming languages (C, C++, or Java, etc.).
2. Basic Data structures and algorithm analysis.

Topics:
1. Graph theory.
2. Graph algorithms and their applications.
3. Combinatorial optimization.
5. Algorithm design and analysis.

Instructor: Wing Ning Li
Contact: JBHT 525; Tel: 575-7264 ; wingning@uark.edu; HomePage: comp.uark.edu/~wingning/
Office hours: Everyday 1:30-2:30 and MWF 4:30-5:00 or by appointment for special situations.
Grading: Assignments 25% Projects 25% Exams 40% class participation 10%

100%-90% A
89%-80% B
79%-70% C
69%-60% D
Below 60% F

Make-up policy: Make-up will be allowed only for students having medical problems or for any weather condition that results in the closing of local schools.

Weather Policy: Call 575-6197 (dept. office) to check if this class will be canceled due to weather while the university remains open (the closing of the university cancels all classes).
Academic Integrity: Students who violate University standards of academic integrity (page 35 of the catalog of studies) are subject to disciplinary sanctions, including failure in the course and suspension from the University. Since dishonesty in any form harms the individual, other students and the University, policies concerning academic dishonesty will be strictly enforced.

Provide all references (other than the textbook and lecture notes) that you consulted in deriving your solutions for the homework and project assignments.

Scheduled Final: December 11 (Tuesday) 3:15-5:15