Instructor: Dr. Oleg A. Prokopyev
Email: prokopyev@engr.pitt.edu
Lectures: T/Th 4:45-6:00 PM, Benedum 543
Office: Posvar 4175
Office hours: By appointment (please contact me by e-mail)
Course website: http://courseweb.pitt.edu

Textbooks: We will primarily use
Some topics will be covered from research papers and from

Course description: We will study various network-based optimization problems and related algorithms. Specifically, the following topics will be covered:
1) Intro to networks and graph theory, intro to algorithmic design and analysis (including polynomial solvability, NP-completeness and approximability)
2) Classical network flows and related problems on graphs, including shortest-path, maximum flows, minimum-cost flows, assignments and matchings, minimum spanning tree
3) Examples of “hard” combinatorial optimization problems on graphs, e.g., maximum clique (independent set) problem, clique relaxations
4) Elements of network analysis: measures and metrics (e.g., centrality), random graph models, social networks, large-scale structure of networks
5) Additional topics (we will discuss examples of the research work in the area and some related applications based on recently published papers)

Prerequisites: Knowledge of the C or C++ programming languages. This is not a programming course, but in order to discuss algorithms it is also necessary to have some programming proficiency.

Grading: There will be regular homework assignments and two exams (mid-term and final). Several homeworks will include some coding problems along with computational experiments. The final exam will have two parts (equally weighted): in-class and take-home. The mid-term will be in-class. Additional details will be provided. Tentative weighting is 35% homework, 25% mid-term and 40% final (20% each part).

Attendance: Attendance is not required but the students are responsible for the announcements made in the class.