CSC2421S Instructors: A. Borodin and C. Rackoff
Text: "Approximation Algorithms" by Vijay Vazirani

CSC2421 is a research oriented graduate course. We expect that students will be familiar with standard complexity issues of NP-hardness as well as being familiar with some basic results in algorithm design and analysis (e.g. having the equivalent of our undergraduate CSC364 course).

The course will consist of three related themes: general algorithmic techniques and approximation ratios for some fundamental optimization problems (e.g. scheduling problems, set cover, vertex cover, maxsat, facility location) , limitations of certain techniques, and results pertaining to the theory of approximation algorithms.

Here is a very tentative list of topics:

1. General algorithmic techniques
   - Greedy
   - Dynamic programming
   - Local Search
   - Linear Programming (LP) and rounding
   - LP primal dual
2. Limitations on certain techniques
   - Priority algorithms as a model of greedy algorithms
   - Local optima in local search
   - Integrality gaps
3. The theory of approximation algorithms
   - MAXSNP and MAXSNP completeness
   - The classes PLS and GLO
   - PCP proofs and hardness of approximation