CS 6550: Design and Analysis of Algorithms
Theory Ph.D. Level
20-09-02: Syllabus

Lectures: Tue, Thu 1:35-2:55, Mason 311.
Instructor: Milena Mihail, 404-385-0617, mihail@cc.gatech.edu
Office Hours: Tue 3:00-4:00 238 CoC, or by appointment.
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   Office Hours: TBA

General Description: Paradigms, problems and methods in the design and analysis of algorithms, together with applications in today’s technology. Problems include: traditional sorting and searching together with some modern considerations in massive data, fundamental graph algorithms for matchings and flows with some current networking applications, linear and integer programming. Methods include classical approaches, such as divide and conquer, dynamic programming, the primal-dual method for mathematical programming, algebras of matrices and polynomials, as well as more current uses of randomization, and state of the art approximation techniques. We shall also cover some number theoretic and cryptographic algorithmic primitives. The emphasis is in the mathematical modeling, the algorithm design, and the formal analysis.


Grading: Weekly or biweekly homeworks: 40%, no collaboration.
   You may use outside references, but you should mention them.
   Late policy: minus 10% for each day.
   Midterm and Final Exam, 20% each, take-home, no collaboration.
   You may use outside references, but you should mention them.
   Midterm and Final Quiz (60-90 mins, closed book, in class), 10% each.
   Midterm Quiz is Tuesday, September 24.
   Plan to spend 15-20 hours weekly on this course.

Prerequisites: The class will run at the Ph.D. theory level. It is suitable for ACO students, Ph.D. students whose research requires substantial formal methods, and advanced undergrads who major in mathematics or theoretical computer science.