

Welcome.

- why study this course:
 - theoretical elegance, insight on hardness of problems
 - ability to research in any area of algorithms
 - ability to recognize problems that arise, apply past techniques, and develop new ones
 - broad sense of “what is algorithms”. Not deep—other courses follow.
- Varieties of problems and algorithms
 - numerical analysis/linear algebra
 - number theoretic. drives cryptography
 - combinatorial—focus of this course.
 - * things involving permutations (sorting), graphs (shortest paths) and subsets (linear programming).
 - * many *optimization problems*—find the best possible solution
 - * almost always, finitely many solutions. brute force always works. we want something better.
 - * combinatorial optimization: major subarea, but not all we cover (vempala course)
 - aspects of all will arise in others
 - some problems/algorithms draw from multiple areas—eg comp. geom.
- course summary sheet
- I will teach fast. Slow me down with questions.
- Course is time consuming and hard.
 - Collaboration is essential but should not be overused.
 - A **strong** background in undergraduate algorithms is too
- Cheating policy on psets
- graders needed