

Computer Science 124

- Algorithms and Data Structures
 - The CORE for all other classes.
- Question: How do we solve problems efficiently?
 - What does efficient even mean?
 - What resources are important?
- Connecting theory and practice.
 - What can we prove, mathematically, about performance?
 - How does this translate – or not – into reality?
 - Problem sets AND programming assignments.
 - What can we do with problems that are too hard to prove anything useful about?

Computer Science 124 : Topics

- An Algorithmic Toolkit
 - Graph Algorithms
 - Greedy Algorithms
 - Divide and Conquer
 - Dynamic Programming
 - Linear Programming
 - Modeling
 - Reductions!

Computer Science 124 : New Ideas

- Using randomization
 - Flipping coins can help you solve problems.
- Approximation algorithms
 - You don't always need to get the right answer.
- Heuristic algorithms
 - Good ideas we can't prove much about.

Computer Science 124 :

Who Should Take It

- CS 124 is all about developing techniques for solving problems.
- This is what CS is all about!
 - Take a problem.
 - Model it.
 - See if a solution already exists.
 - Or if a solution for a similar problem can be tweaked.
 - Or if some general technique applies.
 - Or....
- Everyone who wants to use computers to solve problems should take the course!
 - Good preparation for job interviews – or graduate school!
- I hope to see you there!