

Innovative Teaching – Course Redesign project (ITCR)

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CS 146: Data Structures and Algorithms

Implementations of advanced tree structures, priority queues, heaps, directed and undirected graphs. Advanced searching and sorting (radix sort, heapsort, mergesort, and quicksort). Design and analysis of data structures and algorithms. Divide-and-conquer, greedy, and dynamic programming algorithm design techniques.

Brief description of the course and its place in the curriculum

CS 146 is considered to be one of our department's main bottleneck courses.

It is one of the first courses our transfer students take, perhaps the first course for our non-transfers which has several (4) prerequisite courses, and it is a prerequisite course for most of our upper-division courses.

Summary of course re-design activities

The course has traditionally been taught with standard lectures during class, and homework as well as programming assignments for at-home work.

I plan to flip up to half of the course content, recording lectures for students to watch at home, thus allowing them time to complete programming assignments in class.

Given the challenging nature of the material of this course, this new format should provide students with more, and more useful, opportunities to delve into the material more deeply and to seek assistance as needed. It should also provide better opportunities to the instructor to monitor student mastery of course materials and to intervene effectively and in a timely manner when students struggle.

