

Innovative Teaching – Course Redesign project (ITCR)

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CS 46A/B: Introduction to Computer Science

Basic skills and concepts of computer programming in an object-oriented approach using Java. Classes, methods and argument passing, control structures, iteration. Basic graphical user interface programming. Problem solving, class discovery and stepwise refinement. Programming and documentation style. Stacks and queues, recursion, lists, dynamic arrays, binary search trees. Iteration over collections. Hashing. Searching, elementary sorting. Big-O notation. Standard collection classes. Weekly hands-on activity.

Brief description of the course and its place in the curriculum

CS 46A and CS 46B are the foundational courses in the Computer Science curriculum, covering basic programming and data structures. Most students are our majors, but roughly 30% are majors in other departments in need of programming skills for their work.

Summary of course re-design activities

CS 46A/B has been converted to a large lecture with small group labs. This would not have been possible without leveraging special features of Canvas, our learning management system. More specifically, I will make use of Canvas’s application programming interface (API) in order to:

- (1) give students clear information about their class performance and about what they can do to improve;
- (2) enable professors to identify and easily notify at-risk students early in the course, and to monitor the efficacy of their mentoring; and
- (3) improve the grading interface so that automatically graded programming assignments are entered into the course grade-book, freeing the graders to give students feedback on the quality of their code.

