CS 6104: *Systems Biology and Drug Discovery*

http://www.cs.vt.edu/˜murali/teaching/sbdd/sbdd.html

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Are you curious to find out how the latest research is shaping our understanding of how human diseases are caused, progress, and may be cured or prevented? This course will introduce students to systems biology, a rapidly-growing field that tries to understand the behaviour and function of a living cell as a system of interconnected components. Systems approaches promise to influence drug development in several areas such as disease diagnostics, biomarker and target identification, and predicting the mechanism of action and toxicity of a drug. A key aspect of systems biology is integrating the analysis of diverse types of large-scale biological data, necessating the development of novel computational techniques.

Lectures and presentations of papers from the literature by groups of students will drive the course. Challenging semester-long inter-disciplinary group projects on cutting-edge research problems form a major component of the course. We will discuss the latest research in topics such as

- disease classification using DNA microarrays

- RNA interference to probe gene function

- structure-based drug design

- associating SNPs and haplotypes with diseases, and

- chemogenomics

using ideas and techniques from many areas of computer science. A significant portion of the class will de devoted to understanding the latest biotechnological and experimental advances in these areas.

The course is geared toward graduate students in computer science, mathematics, statistics and the life sciences who are interested in bioinformatics or use bioinformatic tools in their research. Undergraduates are welcome too, with permission from the instructor. See http://people.cs.vt.edu/˜murali/teaching/csb/csb.html for a similar course offered in Fall 2003.