**Computational Thought**
(FRSEM-UA 385; call # )
Instructor: Dennis E. Shasha
Tentatively: Tuesday/Thursday 3:30-4:45

Prerequisites: AP calculus, discrete mathematics, or programming experience

Computational technology and methods lie at the core of modern science, commerce, entertainment, and, regrettably, war. There are very powerful ideas underlying the field that have roots in mathematics, linguistics, engineering, and even philosophy. Some of its greatest inventions were born in cafés or as responses to a puzzle. Some recent algorithmic methods come from studying ants and evolution. This course introduces computational thinking as it builds on logic, linguistics, heuristics, artificial intelligence, and biological computing. The learning style will combine straight lecture, interactive discussions of puzzles and games, and short computer programs (in the programming language Python). Students will make a few presentations during the semester about topics such as the solutions to computationally motivated puzzles, the relative power of linguistic descriptions, and their very own simulations of a Rogerian psychiatrist. The goal is for students to learn to think about computation from multiple perspectives and to synthesize those perspectives when faced with unsolved challenges.

DENNIS E. SHASHA is Professor of Computer Science. His fields of research include computational biology, technologically enhanced privacy, and pattern matching. On the way to becoming a computer scientist, he studied linguistics, engineering, and philosophy. You can find some of his puzzles on the *Scientific American* website: [www.sciam.com](http://www.sciam.com/).