

# CS 6724: Developing Computational Thinking in Middle School Curricula

## INTRODUCTION

This class will assign a few small teams of seniors in computer science and other disciplines to identify and prototype a few examples of computational thinking. “Computational thinking” is a loosely-defined collection of problem solving approaches. Some aspects of computational thinking are:

- Analyzing and logically organizing data
- Data modeling, data abstractions, and simulations
- Formulating problems such that computers may assist
- Identifying, testing, and implementing possible solutions
- Automating solutions via algorithmic thinking
- Generalizing and applying this process to other problems

The investigators on this project believe that there are opportunities to apply computational thinking in different subject areas of middle school education. We seek a few good students who are willing to explore this.

## COURSE DESCRIPTION

This class is a special graduate seminar. This is a project-based class in software engineering, focusing on problem finding and requirements development. Students will work directly with middle school teachers to identify, specify, and prototype a few examples of computational thinking that are appropriate for middle school students. The project will have multiple faculty members who are working on the project advising and directing the students. In addition, a few seniors recruited from computer science will be enrolled in a 4984 senior capstone class to provide design and implementation support.

There will be a single 3 hour class meeting each week, possibly in the early evening.

Students enrolled in the project can expect to take multiple trips to Henrico County to observe classrooms and interact with teachers. Travel will be organized and reimbursed by the project.