Description

Computer simulation is crucial in modern data science. It was first used in the Manhattan Project during WWII at the very dawn of electronic computers. Since then, computer simulation has become the the best way to predict to predict the outcome of many kinds of events, from galactic collisions to election results.

In this course, we students will learn to use computer simulations to predict the outcome of events involving human behavior, such as elections, wars, or sporting events. In so doing, we will cover many topics, including

- random number generation
- sampling and uncertainty
- probability distributions
- propagation of errors
- object-oriented programming (in Python)
- presenting findings to non-experts

The class will be “flipped”, such that the students will be expected to cover the background material (in the form of readings and videos) before class, and class time will be devoted to hands-on exercises that will be turned in for credit. For the final 3 weeks of class will be devoted to individual final projects of of the students’ own design.

Text / Readings

The material will be free and written by the instructor.

Assignments and Grading

The grading will be as follows:

60%: grade on class assignments

25%: attendance and class participation

15%: final project