

STA141

Introduction to Statistical Programming (Undergraduate)

This course is for undergraduate statistics majors and interested students from other departments. Students will learn how to organize computations to access, transform, explore, analyze data and produce results. The primary focus is on teaching the concepts and vocabulary of statistical/scientific computing, rather than providing a tutorial in a particular language. The goal is that the students would be able to work in an office, lab or as a research assistant to do essential computations and that they would be able to legitimately put computing skills on their resume.

While we teach the concepts of programming and the details of a programming language, we will take the opportunity to also teach statistical techniques such as the bootstrap, random number generation, various graphical techniques via examples and exercises. We will also explore statistical methods as we explore simulation.

No background in computer programming is required. We will work with the *R* and *SAS* languages primarily.

- Week 1. Overview of Statistical Computing
- Week 2. Introduction to *R*
- Week 3. Fundamental Data Structures in *R*
- Week 4. Programming in *R*
- Week 5. Visualization & Graphics
Modeling
- Week 6. Data Input/Output
- Week 7. Debugging
Optimization & Efficiency
- Week 8. Introduction to *SAS*
- Week 9. Writing *SAS* Commands
- Week 10. *SAS* Graphics and Programming