

**MSDS 567**  
**Statistical Models and Computing**  
**Spring 2020**

This course is about advanced statistical models and computing methods essential for applications in data science. The topics include advance topics in linear regression, causal inference, logistic regression, discrete choice models, generalized linear models, mixed effects models, bootstrap, EM-algorithm, Bayesian analysis and MCMC method.

**Instructors:** Sijian Wang, Ph.D.  
Associate Professor, Departments of Statistics  
[sijian.wang@stat.rutgers.edu](mailto:sijian.wang@stat.rutgers.edu)

**Office Location:** Hill Center 490, Busch Campus

**Office Hours:** 2-3pm Tuesday or by appointment.

**TA:** Yimeng Shi, [ys565@rutgers.edu](mailto:ys565@rutgers.edu), Hill Center 551  
Office hour: 5-6pm Wednesday or by appointment

**Recommended Textbooks (NOT required):**

*Causal Inference for Statistics, Social, and Biomedical Sciences, An Introduction*, Guido Imbens and Donald Rubin, Cambridge University Press.

*Introduction to Categorical Data Analysis, 3<sup>rd</sup> Edition*, Alan Agresti, Wiley.

*Computational Statistics, 2<sup>nd</sup> Edition*, Geof H. Givens, Jennifer A. Hoeting, Wiley;

*An Introduction to Statistical Learning: with Applications in R*, Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani, Springer;

*Bayesian Data Analysis, 3<sup>rd</sup> Edition*, Andrew Gelman, John B. Carlin, Hal S. Stern and David, B. Rubin, Chapman & Hall;

*Analysis of Longitudinal Data, 2<sup>nd</sup> Edition*, Peter Diggle, Patrick Heagerty, Kung-Yee Liang and Scott Zeger, Oxford University Press;

*An Introduction to R*, <https://cran.r-project.org/doc/manuals/R-intro.pdf>.

**Grading:** Homework: 30%; Midterm: 30%; Final: 40%.