

Masters of Data Science
MATH 6383 – Probability and Statistics II
Spring 2019

Course Information

- Friday 1:00 – 3:00 pm
- SEC 206
- Online: Blackboard through UH Access

Instructors

- Dr. Wenjiang Fu, PGH 684, fuw@math.uh.edu, (713)743-7297
- Dr. Cathy Poliak, Fleming 11c, cathy@math.uh.edu, (713)743-7644
- Office hours: TBD

Course Description

Emphasis on more advanced statistical theory and techniques in modelling data of various types, including continuous, binary, counts and others. The selected topics will include basic probability distributions, likelihood function and parameter estimation, hypothesis testing, regression models for continuous and categorical response variables, variable selection methods, model selection, large sample theory, shrinkage models, ANOVA and some recent advances.

Topics Covered

- Review of probability distributions.
- More on multivariate distributions, conditional distributions, conditional expectation and conditional variance.
- Sampling techniques (geometry, random samples, bootstrap samples, for mean and variance, etc. finite population correction in John Rice Book Ch 7).
- Review of estimation and inference (estimation, moments and maximum likelihood methods, confidence intervals, and hypothesis testing)
- Multivariate distributions (MVN, and hypothesis testing, Hotelling's T2 test, etc).
- Modeling and testing (Generalized linear models – GLM, logistic and loglinear models, consistent and efficient estimation, etc.)

Reference Texts

- John A. Rice : Mathematical Statistics and Data Analysis, 3rd edition, Brooks / Cole, 2007. ISBN-13: 978-0-534-39942-9.
- P. McCullagh and J.A. Nelder: Generalized Linear Models, 2nd ed. 1999 Chapman Hall/CRC. ISBN: 978-0412317606
- Raymond H. Myers, Douglas C. Montgomery, G. Geoffrey Vining, Timothy J. Robinson, Generalized Linear Models: with Applications in Engineering and the Sciences, 2nd ed. Wiley, 2010. ISBN: 978-0-470-45463-3.

Assessment

The course grade will be based on the following.

- 10% In class discussion
- 30% Homework assignments
- 40% Two midterms
- 20% Final project