STAT510: MATHEMATICAL STATISTICS I
SPRING 2019

Instructor: Xiaohui Chen (email: xhchen@illinois.edu). Office: 104A Illini Hall.

Class: Tuesday and Thursday 8:00am-9:20am, 245 Altgeld Hall.

Office hours: Tuesday 1:30pm-3:00pm or by appointment, 104A Illini Hall.

Course TA: Zihe Liu (email: ziheliu2@illinois.edu).

TA office hours: Wednesday 3:00pm-5:00pm. 104 Illini Hall.

http://www.istics.net/pdfs/mathstat.pdf

Topics: This is an introductory level of mathematical statistics at the master level. Tentative topics are listed below. (Chapter 2-11 and 15-19 in the textbook.)

Distribution theory: transformation of random variables, moment generating functions, conditional distributions, multivariate normal distribution;
Point estimation: method of moments, maximum likelihood, Bayes methods, EM algorithm, MCMC;
Hypothesis testing: likelihood ratio test, Bayesian tests, confidence intervals, nonparametric tests;
Model selection: AIC, BIC, penalized methods;
Asymptotics: law of large numbers, central limit theorem, continuous mapping, Slutsky's theorem, Delta-method.

Homework: Approximately 8 homework assignments posted on Compass 2g (https://compass2g.illinois.edu). Homework will be submitted to the drop box STAT510 in the Illini Hall by the due date and time. No late homework is accepted for grading and missed homework will be a zero mark.

Exams: There will be one midterm exam (in class) and one comprehensive final exam. The exam date and time will be announced during the class progress.
**Exam policy:** A missing midterm exam will result a zero mark. If you are unable to make the exam, you must contact the instructor at least **one week** before the exam. All excuse must be made for a legitimate reason (e.g. illness with a doctor's note). There will be **NO MAKE-UP** midterm exams. However, grading weight for a missing midterm exam based on a legitimate reason will be imputed by your final exam score.

**Grading:**

Homework: 50%
Midterm exam: 20%
Final exam: 30%

For example, if the homework score is 95, the midterm exam score is 85, and the final exam score is 80 (all out of 100), then the course score is $0.5 \times 95 + 0.2 \times 85 + 0.3 \times 80 = 88.5$.

Grading scale on the course scores is:

- 97 to 100: A+
- 93 to 96.9: A
- 90 to 92.9: A-
- 87 to 89.9: B+
- 83 to 86.9: B
- 80 to 82.9: B-
- 77 to 79.9: C+
- 73 to 76.9: C
- 70 to 72.9: C-
- 67 to 69.9: D+
- 63 to 66.9: D
- 60 to 62.9: D
- Below 60: F