高等统计学 (Advanced Theory of Statistics) 00112640

课程中文简介
这是一门主要给概率统计及相关专业具有适当知识基础的硕士和博士研究生开的关于统计理论的核心课程。主要内容包括统计模型，估计，假设检验，渐近理论。

课程英文简介
This is a core course in statistical theory for beginning graduate students in statistics, probability, or related fields where a sound understanding of statistical principles is essential.

先修课程
概率论、数理统计、测度论

参考书：
Mathematical Statistics by J. Shao

1. Mathematical Statistics: Basic Ideas and Selected Topics, Vol. I (2nd ed.), by P. J. Bickel and K. A. Doksum
2. Theory of Point Estimation (2nd ed.), by E. L. Lehmann and G. Casella
3. Testing Statistical Hypotheses (3rd ed.), by E. L. Lehmann and J. P. Romano 4. Advanced Mathematical Statistics (Chinese), by X. Chen

成绩评定办法
Homework 20%, midterm 30%, final 50%.

Homework assignments are due every other Monday starting Week 3.

There will be a midterm exam and a final exam, both closed book. The final will be comprehensive, with an emphasis on materials covered since the midterm.

教学方式
课堂讲授为主，结合课堂讨论

内容提要
Statisitical models
Exponential families
Statistial decision theory
Sufficient statistics
Complete statistics
Criteria of estimation

Unbiased estimation
Information inequality; Method of moments
Bayes actions and estimators
Minimax estimators
Maximum likelihood
MLEs in generalized linear models; Superefficiency
Asymptotic efficiency of MLEs; One-step MLEs
Hypothesis testing; The Neyman–Pearson lemma
Uniformly most powerful tests; UMP unbiased tests
Likelihood ratio tests; Bayes tests
Asymptotic tests; χ2-tests
*Construction of confidence sets
*Optimality of confidence sets; Bayesian credible sets
*Asymptotic confidence sets; Prediction sets; Simultaneous confidence intervals