

LARGE SAMPLE THEORY

Statistics 611

Winter 2008

- Instructor:** Robert Keener
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- Office Hours: Monday, 11:30 am–12:30 pm; Tuesday, 11:00 am–12:00 noon;
Wednesday, 3:00–4:00 pm.
- Text:** Draft for a book I am writing.
- Optional Text:** *Testing Statistical Hypotheses, Third Edition*
E. L. Lehmann and Romano, Springer, 2005
- GSI:** Nengfeng Zhou
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- Office Hours: Thursday, 3:00–5:00 pm.
- Grading:** Homework: 20% (total)
Midterm Exam: 30%
Final Exam: 50%
(Monday, April 21, 4:00 pm to 6:00 pm)

SYLLABUS

1. Large Sample Theory (3)
Convergence in Probability; Convergence in Distribution; Maximum Likelihood Estimation; Medians and Percentiles; Asymptotic Relative Efficiency.
2. Estimating Equations and Maximum Likelihood (6)
Weak Law for Random Functions; Consistency of the MLE; Limiting Distribution for the MLE; Asymptotic Confidence Intervals; EM Algorithm; Limiting Distributions in Higher Dimensions; Robust M -Estimation of a Location Parameter.
3. Large Sample Theory for Likelihood Ratio Tests (6)
Generalized Likelihood Ratio Tests; Contiguity; Asymptotic Distribution of $2 \log \lambda$.
4. Nonparametric Regression (4)
Kernel Methods; Hilbert Spaces; Splines; Density Estimation.
5. Bayesian Inference (2)
Hierarchical Modeling; Applications.
6. Bootstrap Methods (4)
Bias Reduction; Confidence Intervals.