Statistical Methods Preliminary Exam Syllabus

Department of Mathematical Sciences

University of Cincinnati

(Updated October 2020)

Exponential families; sufficient statistics, convex loss functions, UMVA estimators, the information inequality, the multiparameter case and other extensions; Bayesian inference; asymptotic efficiency; efficient likelihood estimation; the Neyman-Pearson fundamental lemma; distributions with monotone likelihood ratio; a generalization of the fundamental lemma; two-sided hypotheses; least-favorable distributions; unbiasedness for hypothesis testing with one-parameter exponential families; similarity and completeness; UMP unbiased tests for multiparameter exponential families.

This material is covered in STAT 7031.

Texts:
Casella and Berger, *Statistical Inference* (2nd edition).
Lehmann and Casella, *Theory of Point Estimation*.
Lehmann, *Testing Statistical Hypotheses*.