Topics for the Graduate Exam in Math 541A (Statistics A)

Distributions: Parametric models, families of discrete and continuous distributions, exponential families, multivariate normal distribution, derived distributions from normal samples including *t*, chi-squared, and *F*; mixtures.

Probability: Jensen, correlation, Holder, Markov and Chebyshev inequalities; order statistics, quartiles, percentiles, probability integral transformation and its inverse, modes of convergence, limit theorems, Slutsky theorems, delta method, variance stabilizing transformations.

Point estimation: method of moments, maximum likelihood, unbiased estimation, Bayes estimation, comparison of estimators, optimality, Fisher information, Cramer Rao inequality, asymptotic efficiency, sufficiency, completeness, Rao Blackwell and Lehman Scheffe theorems

References:

G. Casella and R.L. Berger, Statistical Inference
T.S. Ferguson, A Course in Large Sample Theory
E.L. Lehmann, Theory of Point Estimation