STAT422
List of topics for Exam 2

Chapter 7

- CLT
- The variance of a sum of independent rvs is the sum of the variances
- Sampling distribution of the sample mean for large sample sizes.
- To get a normal sample mean for small samples, what must be true?
- Sampling distribution of the sample variance when the data are normal.
- *t*-distribution, and *t* statistic.
- F distribution and F statistic.

Chapter 8

- bias, error in estimation, margin of error
- CIs for a mean or variance for large *n*
- CIs for a mean or variance for small *n*
- pooled sample variance across multiple populations
- CIs for a difference in means or proportions
- Interpretations of CIs

Chapter 9

- consistency
- sufficiency
- MOM estimation
- Likelihood
- Find MLEs
- Know how to "typically" find an MVUE from an MLE
- Cramer-Rao lower bound
- Know the 7 beautiful properties of MLEs including invariance, consistency, sufficiency, asymptotically efficient, and asymptotically normal

Chapter 16

- Know the differences between frequentist and Bayesian views and interpretations
- Find Posteriors
- Principles underlying the choice of a prior
- Find Bayesian mean and MAP estimators.
- Show that a Bayesian estimator is consistent.
- For the normal posterior of a population mean and the beta posterior for a population proportion covered in class, Bayesian means and MAPs can be unbiased yet consistent, with a smaller variance than the MVUE.
- Credible/probability intervals, calculation and interpretation.
- Know the posterior for a population proportion, using non-informative and conjugate priors
- Know the posterior for a population mean, when the variance either is known or unknown, using non-informative and conjugate priors