Guidelines to the Final Exam

Topics included in the exam:

Probability: Sample space, Rules of probability, conditional probability, Independent Events, Bayes’ Theorem.

Probability distributions and Densities: Continuous random variables, probability density functions, Bivariate distributions, Marginal distributions, Conditional distributions.

Mathematical Expectation: Expected value of a random variable, moments, Chebychev’s theorem, moment generating functions, moments of linear combinations of random variables, conditional expectations.

Special probability distributions: Bernoulli, Binomial, geometric, Poisson

Special probability densities: Uniform, Gamma, exponential, Chi-square, Beta, Normal distribution, Bivariate normal distribution.

Functions of Random variables: Distribution function technique, transformation technique: one variable, several variables-, moment generating function technique.

Limiting distributions: Convergence in distribution, Limiting moment generation function, central limit theorem

Sampling distributions: The distribution of the sample mean, Chi-square distribution, t distribution, F distribution, order statistics.

Estimation Theory: Method of moments, maximum likelihood techniques, Bayesian Estimation, Unbiased estimators, Efficiency, Consistency, sufficiency.

Interval Estimation: Estimation of means, the estimation of proportions, the estimation of variance, difference between means, difference between population proportions

Hypothesis testing: Theory: Testing a statistical hypothesis, The Neyman-Pearson Lemma, power of the test, most powerful tests, Likelihood ratio test, rxc tables, goodness of fit tests.

Regression Analysis: simple linear regression, non-linear regression

ABOUT THE FINAL EXAM:
Closed book, classical
Date: February 28, Saturday
Time: 11:00-13:00 HS 1199
Duration is 115 min.
Formula sheet will be given. You won’t need a calculator or statistical tables!