

# Topics Covered for the Final Exam, Fall 2017

STAT 4705

## Chapter 2: Probability

- Sample Spaces, Events, Mutually Exclusive Events (Section 2.1 & 2.2)
- Counting Sample Points: Principle Rule of Counting, Permutations, Combinations (Section 2.3)
- Probability of an Event (Section 2.4)
- Addition Rule (Section 2.5)
- Conditional Probability (Section 2.6)
- Multiplication Rule, Independent Events (Section 2.7)

## Chapter 3: Random Variables and Probability Distributions

- Random Variable (R.V.), Discrete R.V., Continuous R.V. (Section 3.1)
- Discrete pdf & cdf (Section 3.2)
- Continuous pdf & cdf (Section 3.3)
- Joint pdf, marginal pdf, conditional pdf, Statistical Independence (Section 3.4)

## Chapter 4: Mathematical expectation

- Mean/Expected Value of a R.V. (Section 4.1)
- Variance and Covariance of a R.V. (Section 4.2)
- Means and Variances of Linear Combination of R.V.s (Section 4.3)

## Chapter 5: Some discrete probability distributions

- Geometric Distribution (Section 5.5)
- Binomial Distribution (Section 5.3)
- Multinomial Distribution (Section 5.3)
- Hypergeometric Distribution (Section 5.4)
- Poisson Distribution (Section 5.6)

## Chapter 6: Some Continuous probability distributions

- Uniform Distribution (Section 6.1)
- Normal Distribution (Section 6.2-6.4), Normal approximation to the Binomial (Section 6.5)
- Exponential Distribution (Section 6.6-6.7)
- Chi-Squared Distribution (Section 6.8)
- T Distribution (Section 8.7)
- F Distribution (Section 8.8)

## Chapter 8: Fundamental sampling distributions and data descriptions

- Random Sampling (Section 8.1 & Section 1.3)
- Graphical Representation of the Data: Histogram, Stem-and-leaf plot, Boxplot (Section 8.3 & Section 1.8)
- Sampling Distributions (Section 8.5-8.8)

## Chapter 9: One- and two- Sample estimation problems

- Introduction of Statistical Inference: Point Estimation vs. Interval Estimation (Section 9.1-9.3)
- Case 1&2: One sample estimation of the mean when is known or unknown (Section 9.4)
- Case 3&4: Two sample estimation of the difference between two means when are known or unknown but (Section 9.8)
- Case 5: One sample estimation of the proportion (Section 9.10)
- Case 6: Two sample estimation of the difference between two proportions (Section 9.11)

## Notes

- Final exam is cumulative
- Topics not in the final exam
  - Bayes' Rule (Section 2.8)
  - Chebyshev's Theorem (Section 4.4)
  - Discrete Uniform Distribution (Section 5.2)
  - Gamma Distribution (Section 6.6-6.7)
  - Descriptive Statistics (Section 8.2 & Section 1.4 & Section 1.5)
  - Case 7: One sample estimation of the variance (Section 9.12)