

# Biostatistics

Topics for the Midterm: 2017

The lecture notes are a helpful source of topics but here is a comprehensive list.

All sections and chapters refer to the Navidi textbook.

1. Python Programming
  - (a) Basic programming skills, loops, if, lists and arrays
  - (b) Plotting histograms and line graphs (no need to know decorative options, eg colors etc), just plot and hist
  - (c) Using the random and numpy module to generate uniform and normal distributions
  - (d) Compute percentiles and probability plots
  - (e) **NOT** computing binomial etc probabilities.
2. Summary Statistics (Chap 1)
  - (a) Mean, Mode, Median, Standard deviation, variance, population and sample.
  - (b) Quartiles and Percentiles
  - (c) Plots: Bar, Histograms, line, scatter, boxplots
3. Probability (Chap 2)
  - (a) Events and Sample Space
  - (b) Axioms of probability
  - (c) Mutually exclusive events
  - (d) General addition and multiplication rule for probabilities.
  - (e) Complement
  - (f) Counting: Permutations and Combinations
  - (g) **NOT** Conditional probability or Bayes Theorem
4. Random Variables(Chap 2)

- (a) Discrete and Continuous Variables
- (b) Probability Mass Functions
- (c) Cumulative Distribution Function
- (d) **NOT** Chebyshev's Inequality
- (e) Linear functions of random variables
- (f) **NOT** jointly Distributed random variables (sec 2.6 in Navidi)
- (g) **NOT** Chapter 3 in Navidi

5. Distributions (Chap 4)

- (a) Bernoulli Distribution
- (b) Binomial Distribution
- (c) Poisson Distribution
- (d) **NOT** section 4.4 (Other discrete distr)
- (e) Normal Distribution including z scores
- (f) **NOT** section 4.6 (Lognormal)
- (g) Exponential Distribution
- (h) Uniform Distribution (**NOT** Gamma or Weibull distribution)
- (i) **NOT** section 4.9 (Principles of point estimation)
- (j) Probability plots - see lecture slides (section 4.10)
- (k) Central limit theorem (section 4.11, **NOT** continuity correction)
- (l) Simulation, section 4.12 (only what we did in class)

6. Confidence Limits (Chap 5)

- (a) Large populations, section 5.1
- (b) Proportions, section 5.2
- (c) Small populations, section 5.3
- (d) Difference between two means, large populations, section 5.4
- (e) **NOT** 5.5 difference between two proportions
- (f) Difference between two means, small populations, section 5.6
- (g) **NOT** Paired Data
- (h) Simulation, section 5.8, what we did in class.