Biostatistics

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Objective: Students can learn basic techniques of data analysis, probability theory and elementary statistical inference concepts and methods

Textbook: “The Practice of Statistics in the Life Sciences”
By Aaldi & Moore, W. H. Freeman and Company

Grading rule: the maximum of the following two formula
1. HW: 30%, Midterm: 30%, Final: 40%
2. HW: 20%, Midterm: 35%, Final: 45%

References:
“Statistical Methods in the Biological and Health Sciences”
by J. Susan Milton.
“A First Course in Probability” by S. Ross

Topics overview:
1. Data analysis
   - Plots
   - descriptive measures:
2. Probability theory - Set-based
   - General concepts
   - Applications in genetics
   - Applications in epidemiology
3. Probability and random variables
   - Discrete random variables (general, Binomial, Poisson)
   - Continuous random variables (general, uniform, exponential, normal)
4. From probability to statistics
   - random sample
   - properties of the sample mean (law of large number, central limit theorem, Chebyshev inequality)
5. Confidence interval for the population mean
6. Hypothesis testing