

PH 142: INTRODUCTION TO PROBABILITY AND STATISTICS

Instructor: Steve Selvin, Professor of Biostatistics
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Course format: Three hours of lecture (MWF 8-9AM) and two hours of discussion/lab per week

Prerequisites: High school algebra

Course requirements: Ten homework assignments, one midterm and a final examination.

Text: *Biostatistics: How It Works* by Steve Selvin, Pearson Education (Prentice-Hall) 2004.

Topics covered include descriptive statistics, probability, probability distributions, point and interval estimation, hypothesis testing, chi-square, correlation and regression with biomedical applications.

WEEK 1. Descriptive statistics -- ungrouped data
descriptive statistics (Chapter 1)

WEEK 2. Descriptive statistics -- grouped data
displaying data (Chapter 1)

WEEK 3. Probability -- definitions and theorems
basic probability (Chapter 2)
probability laws (Chapter 2)

WEEK 4. Probability -- sampling with replacement (Chapter 2)

WEEK 5. Random variables -- expectation and variance
random variables (Chapter 3)
population expectation and variances (Chapter 3)

WEEK 6. Probability distributions -- discrete
binomial (Chapter 4)

WEEK 7. Probability distributions -- continuous
normal distribution (calculations) (Chapter 4)

WEEK 8. Statistical inference – interval estimation
confidence intervals for a mean, for a proportion (Chapter 5)

WEEK 9. Statistical inference – one-sample hypothesis tests
hypothesis tests (Chapter 5)
power of tests (Chapter 5)

WEEK 10. Statistical inference – two sample confidence intervals and hypothesis tests (Chapter 6)

WEEK 11. Chi-square tests: two way classification
two-way tables (Chapter 7)

WEEK 12. Chi-square tests: goodness of fit (Chapter 7)

WEEK 13. Linear regression: least squares estimates of a line
estimating a line, introduction (Chapter 8)

WEEK 14. Inference on regression parameters
linear regression (inference) (Chapter 8)

WEEK 15. Correlation coefficients (Chapter 9)