
STAT 205 SYLLABUS

Course: Elementary Statistics for Biological and Life Sciences (Spring 2017)
Instructor: Haigang Liu | haigang@email.sc.edu | Office Hours: By appointment

CLASS MEETINGS

Tuesdays & Thursdays from 11:40 am – 12:55 pm in WMBB 127.

TA OFFICE HOURS

Lili Tong | Wednesday 11 am – 2 pm, Friday 12 – 3 pm | LeConte 200 D | lili@email.sc.edu
* *Lili Tong is also your homework grader.*

DESCRIPTION

3 credits; prerequisite is Math 111 or higher. This course gives students in biology, ecology, public health, pharmacy, nursing and other life sciences a non-calculus based introduction to the application of modern statistical methods including descriptive and inferential statistics. Statistics is a *foundational research tool* within the biological and life sciences. Topics include descriptive statistics, probability, and inference for statistical models including: one and two sample problems for continuous and discrete data, 2×2 tables (independence; comparing odds ratios, relative risks, and differences in proportions; diagnostic testing), one-way ANOVA, linear and logistic regression, and survival analysis.

LEARNING OBJECTIVES

After completion of the course, the successful student will be able to

- (a) understand & interpret common graphical displays and summary statistics from data,
- (b) apply the rules of probability to solve basic problems,
- (c) understand aspects of one and two sample problems, including confidence intervals, hypothesis testing, sample size calculation, power, and checking assumptions,
- (d) understand basic ideas underlying one-way analysis of variance,
- (e) understand aspects of the simple linear regression model: least squares estimation, the normal-errors model, confidence interval and hypothesis tests for slope β_1 ,
- (f) understand the logistic regression model and its use for analyzing Bernoulli outcomes with a continuous predictor,
- (g) understand aspects of 2×2 contingency tables: relative risk, odds ratio, difference in proportions, case-control studies, independence, sensitivity, specificity, and prevalence, predictive values positive and negative, Simpson's paradox and the Cochran-Mantel-Haenszel test,

- (h) have a basic understanding of related ideas including receiver operator characteristic (ROC) curves, disease rates, incidence versus prevalence, and survival curves, and
- (i) be able to carry out common statistical methods in the computing package R.

REQUIRED TEXTBOOK

Lecture Book: *Statistics: Statistics for the Life Sciences* (4th ed.), by Samuels, M.L., Witmer, J.A., and Schaffner, A. Addison Wesley, 2011.

COMPUTING

Statistical analyses will be carried out via R, free software for statistical computing and graphics. If you have your own Windows-based machine or a Macintosh, you can install R now from <http://cran.r-project.org/>. You will also need a scientific calculator for exams.

HOMEWORK AND EXAMS

Homework assignments will be posted on the course website weekly/biweekly, except exam weeks. I cannot over-stress how important these assignments are to learning the material. No Late homework. Two in-class exams will be given, midterm and final, currently scheduled for Thursday, March 2nd (midterm) and Tuesday, May, 2nd (final).

GRADING

Each of the exams is worth 25%, your homework is worth 50%. Grades: 90%-100% A, 85%-89% B+, 80%-84% B, 75%-79% C+, 70%-74% C, 65%-69% D+, 60%-64% D, under 60% F.

TUTOR CENTER

You are encouraged to visit the Student Success Center (SSC) for peer tutoring for STAT 205, if needed. Website: <http://www.sc.edu/success/peertutoring.html>.

HONOR CODE AND STUDENT CONDUCT

See the Carolinian Creed in the Carolina Community: Student Handbook & Policy Guide.

STUDENT DISABILITY SERVICES

If you qualify for accommodations because of a disability, please submit a letter from the Office of Student Disability Services *prior to the first exam* so that your needs may be addressed. The Office of Student Disability Services determines accommodations based on documented disabilities. You may contact them at 803-777-6142, LeConte 112A, or <http://www.sa.sc.edu/sds>.