



UNIVERSITY OF MIAMI DEPARTMENT OF BIOLOGY

Biostatistics

Course Title	Biostatistics
Term	Spring 2009
Number	BIL 311
Credits	3
Class Meeting	Tue-Thu – 3:30 pm – 4:45 pm
Room	Cox 213

Instructor Information

Name/Title	Dr. Patricia Buendia
Department	Biology
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Course Objectives

This is a basic course for undergraduate pre-medical students and biology students. It covers the basics of probability and inference including categorical data. Other topics include regression, correlation and analysis of variance. It is designed for students who have no previous background in statistics, and its mathematical level assumes a working knowledge of basic algebra. Descriptive statistics, statistical inference will be discussed along with basic concepts of probability, discrete and continuous probability distributions, and hypothesis testing.

Homework and many of the class discussions will focus on solving statistical problems\exercises. A 1-credit SPSS lab accompanies this course. Statistical analysis with the SPSS software will be taught in the lab and at least once during class. Statistical analysis with Microsoft Excel will be taught occasionally during the Bil311 course and will be used for homework.

Prerequisites:

MTH 108 or scores of Mathematics Placement Test sufficient for admission to a calculus course, plus 12 credits in biology. Not open to students with credit in MTH 224 or PSY 204 or equivalent.

Textbook

Required

Rosner B. *Fundamentals of Biostatistics*. 6th edition. Duxbury (2006).

Optional

Motulsky H. *Intuitive Biostatistics*. Oxford University Press, 1995

The Analysis of Biological Data. 1st edition, Roberts and Company Publishers (July 2008).

Course Outline

Chapter 2: Descriptive Statistics

- Arithmetic mean
- Variance and standard deviation

Chapter 3: Probability

Chapter 4: Discrete Probability Distributions

- The expected value or population mean
- The Binomial Distribution
- The Poisson Distribution

Chapter 5: Continuous probability distributions

- The Normal Distribution

Chapter 6: Estimation

- Estimation of the mean
- Standard Error of the mean and variance
- Confidence intervals

Chapter 7: Hypothesis Testing: One Sample Inference

- Chi-square test
- Power of a test
- Binomial Test
- Poisson Test

Chapter 8: Hypothesis Testing: Two Sample Inference

- Paired t Test
- Two sample t Test

Chapter 9: Nonparametric Methods

Chapter 10: Hypothesis Testing: Categorical Data

Chapter 11: Regression and Correlation

Chapter 12: Multisampling inference: ANOVA

2 and sometimes 3 lectures are assigned to each topic\chapter. The number of lectures per topics is an approximate estimate and will be revised during the semester.

Attendance

This is a participatory course and you should be in class to succeed. I will not record attendance, but I may present material in class that is not readily available in the textbook and it is your responsibility to keep up with this material if you miss class.

Class Etiquette

Out of respect for your fellow students, and me, I request that you turn up to class on time, stay in class for the full period, avoid unnecessary noise or chatter and turn off your cell phone.

Homework Assignment Guidelines

All homework assignments are assigned a due date and will be expected to be handed in on that date. All assignments and exams are based on points. If the assignment is not handed in on the due date, a grade of 0 will be assigned. If an assignment is late due to an unforeseen circumstance please notify the instructor. You will need to submit a late assignment ***together with a photocopy of the document that provides evidence of your particular circumstance*** no later than the next class after the assignment's deadline. Make-ups of exams are only given due to ***documented*** circumstances (death, hospitalization, changed work schedules and business trips).

All assignments/homeworks will be evaluated using the following criteria:

- Correct result and description of result
- Correct statistical technique
- Detailed presentation of results

Individual homework assignments are expected to be done by individuals without collaboration with others. ***A grade of 0 will be assigned to assignments that violate the non-collaboration policy.*** The purpose of the homework assignments is to help you learn the material. In this course, the homework assignments are designed to have you practice doing statistical calculations to learn a hands-on approach to analyzing data. For this reason it is ***your responsibility to ensure that no other student in this class has access*** to either hard-copy or machine-readable versions of your assignment. Academic dishonesty will not be tolerated under any circumstances.

Collaboration and Policy on Academic Dishonesty

You are required to uphold the student Honor Code, which can be found at: http://www6.miami.edu/UMH/CDA/UMH_Main/0,1770,2618-1;12148-3,00.html.

It is the policy of the Biology Department that academic dishonesty or complicity with the dishonest will result in a failing grade in the course. While I encourage discussion about assignments, ***all work is considered to be individual work*** unless I specify otherwise.

Signed pledges are required for written work submitted for evaluation.

The pledge is to be written out and signed on all homework assignments:

“I have neither given nor received unauthorized aid on this piece of work”

Add student's signature and date to the pledge.

Thus, students will state that the work that was submitted is their own and will be held accountable if evidence appears that is contrary to this statement. Students are reminded that neither the presence nor the absence of a signed pledge statement will allow students to violate established codes of conduct as described in the Honor Code.

Grading Policy

Grading Criteria	number	percent of total
<i>Tests</i>	2	30%
<i>Final Exam</i>	1	20%
<i>Special Assignment</i>	1	20%
<i>Quiz</i>	10	10%
<i>Homework</i>	10	20%

Final Grading Scale	A (A-, A, A+)	B (B-, B, B+)	C (C-, C, C+)	D (D-, D, D+)
Percentage Score	90-100	75-89.99	60-74.99	50-59.99