

COURSE SYLLABUS

BIOL/STAT 335 – Introduction to Biostatistics – Section 004 – 4-credit course

Spring Semester 2013 – Tuesdays/Thursdays 11.30 – 12.45 in MUND-303; Tuesdays 1.00 – 2.00 in LSB-315

Prerequisites: Calculus II & Biology 102 and maturity to move quickly through new material

Text: Samuels, Witmer & Schaffner, *Statistics for the Life Sciences*, 4th Edition (2012) – Prentice-Hall (required)

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Office Hours: Tuesdays and Thursdays 2.15 – 4.15pm; and by appointment

Course Web Page: <http://webpages.math.luc.edu/~tobrien/courses/new335/course-homepage.html>

Students should bookmark and check the above course website on a regular basis

Course Overview

To the uninformed, the field of Statistics is a branch of Mathematics that deals with numerical facts, formulas, calculations, charts and tables. In fact, Statistics is the science and art of making sound decisions and estimations based on incomplete, realistic information. It is in this regard that Statistics is fundamentally different from Mathematics: in the latter realm, all conclusions follow absolutely and necessarily but may be only tangentially related to the real world. In contrast, applied statisticians obtain answers to concrete questions by providing structure (models) to phenomena and by drawing intelligent inferences. In addition, whereas Mathematics uses deductive logic, Statistics uses induction.

This course provides students with a thorough introduction to statistical methods used in applied biological (in the wider sense), biomedical, and biostatistical research. Theoretical aspects are presented only as necessary and are de-emphasized in this course. Our focus for this course will be on developing both a “statistical tool-kit” and experience in knowing when each technique is appropriate, as well as developing an awareness and a critical assessment of possible limitations of these methods. Memorization of formulae will not be stressed; proper implementation of statistical decision-making is paramount and will be underscored.

Quizzes, Tests and Homework

Two 50-minute quizzes will be given during the semester, on Thursday February 7th and on Tuesday April 9th. In addition, a midterm and final examination will be given and students will complete a class project-paper. Students will need their own scientific calculator for quizzes/exams, and these may not be shared. No PDAs (palm computers), cell phones, or beepers are permitted during quizzes and exams. Students will be permitted to use one standard (8.5” x 11”) sheet of their own handwritten notes for each quiz and exam; statistical tables will be distributed for each quiz and exam. Homework will be assigned and will not be collected, but solutions will be discussed with students (e.g., during office hours) to help prepare for quizzes and exams.

Grading Scheme

First Quiz (February 7 th)	13.3 %
Midterm Exam (March 14 th)	26.7 %
Second Quiz (April 9 th)	13.3 %
Final Exam (April 30 th)	29.2 %
Project-Paper	10.0 %
Computer Lab Assignments/Participation	7.5 %

Final course (letter) grades will be awarded according to the following grading scheme:

[87.5 , 90.0) = B+	[92.5 , 100] = A	[90.0 , 92.5) = A-
[77.5 , 80.0) = C+	[82.5 , 87.5) = B	[80.0 , 82.5) = B-
[67.5 , 70.0) = D+	[72.5 , 77.5) = C	[70.0 , 72.5) = C-
	[60.0 , 67.5) = D	[0.0 , 60.0) = F

Make-ups

The First Quiz score will be raised to the grade of Midterm Exam if the latter grade is higher; similarly, the Second Quiz score will be raised to the grade of Final Exam if the latter grade is higher. In this sense, quiz scores are preliminary. *Hence, there will be no make-up quizzes.* A make-up for Midterm Exam will be given **only in case of an illness verified by a note from a physician or in case of a death in a student's family.** If a student misses the Midterm Exam for any other reason, s/he will be given the grade of zero for the exam. Similarly, the Final Exam is very final; if a student misses the Final Exam, a make-up is given only with approval of his/her Academic Dean (and it is granted only for documented serious reasons).

Academic Honesty

It is required that all students do their own work on all quizzes and exams as well as on the class paper/project. Submitting work as your own which is copied or paraphrased from someone else is not permitted and will not be tolerated. Cheating includes, but is not limited to, illegal collaboration, copying, using materials not permitted on tests, and assisting others on tests. Anyone found cheating will not be permitted to withdraw and will receive an "F" grade for the course; in addition, the student's academic Dean will be informed and a statement will be placed in his/her permanent file.

Participation

Students are expected to attend all classes and to actively participate in classroom discussion. It is expected that students will read the lecture material before class so as to better benefit from the class lecture and discussion.

Calculator and Computing

Students will need to own and operate their own scientific calculator and will become familiar with the Minitab statistical software package – both programming Minitab on a PC and interpreting output. If you would like to purchase the software for your home computer, *The Student Edition of Minitab* is available from various publishers. In the past, students rented the software from www.minitab.com for about \$25 for 6 months. Many PC's around campus have Minitab installed for student use.

Semester Schedule – to be updated during the semester

<u>Class dates</u>	<u>Topics discussed (and Chapter in text)</u>
Jan. 15, 17	Introduction (1) and Descriptive Statistics (2)
Jan. 22, 24	Probability and Binomial Distribution (3)
Jan. 29, 31	Normal Distribution (4)
Feb. 5, 7	Sampling Distributions (5); Quiz #1 on 7 th during last 50 minutes of class
Feb. 12, 14	Confidence Intervals (6)
Feb. 19, 21	Comparing Two Independent Groups (7)
Feb. 26, 28	Comparing Two Independent Groups continued (7)
Mar. 5, 7	No Classes – Spring Break
Mar. 12, 14	Paired Data Analysis (8); Midterm Exam on 14 th (75 minutes)
Mar. 19, 21	Paired Data Analysis (8); One-sample Categorical Data (9)
Mar. 26, 28	Categorical Analysis: Relationships (10)
Apr. 2, 4	Categorical Analysis: Relationships (10); ANOVA (11)
Apr. 9, 11	ANOVA (11) ; Quiz #2 on 9 th during last 50 minutes of class
Apr. 16, 18	Simple Linear Regression (12)
Apr. 23, 25	Regression (12); Summary (13)
Apr. 30	Final Exam (9:00 – 11:00am)

Note: *The last day a student can withdraw without a penalty grade of WF is Monday, March 25th.*