MTH 114-01 Spring 2013
Statistics for Natural Sciences
Prof. A. Wittenstein

Contact Information

Office: Post Hall 103
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Course Web Page: http://www.adelphi.edu/~wi16133/mth114/s13/
Office Hours: M/W 5:30-6:00pm, in Swirbul 101.
Other days/times by appointment, in Post 103

Class Meetings

M/W 4:15-5:30pm, Swirbul 100 (W 1/23 → W 5/8)
--M 3/11 & W 3/13: Spring Break – No Classes
--W 4/10: Research Day – No Classes
--W 5/15: Final Exam – from 3:30-5:30pm

Prerequisite

High School Mathematics through Intermediate Algebra (i.e. Algebra 2, Math B)

Course Description

- Develop tools for making decisions when faced with data.
- Learn techniques for analyzing and displaying data using illustrative examples drawn from the sciences.
- Learn techniques for performing statistical tests using illustrative examples drawn from the sciences.
- Make extensive use of statistical software in integrated labs and lectures as an aid to reason.

General Education

- For students who were admitted to Adelphi prior to Fall 2011 or transferred to Adelphi prior to Fall 2012, this course counts as a "Second Competency Course".
- For students who were admitted to Adelphi for Fall 2011 or later or transferred to Adelphi for Fall 2012 or later, this course counts as a "Formal Sciences Distribution Course" and satisfies the University Learning Goal in "Quantitative Reasoning".

Course Learning Goals

Given the appropriate data, students will:

- create a graphical display (i.e. bar chart, pie chart, stem-and-leaf display, histogram, box plot, scatterplot).
- calculate a numerical summary measure (i.e. mean, median, variance, range, IQR, correlation coefficient).
- compute a z-score or a t-score
- calculate a confidence interval
- conduct a hypothesis test
- find the equation of the regression line
- use SPSS software to do any of the above

Grading

Assignments	30%	Midterm Exam	20%: Wednesday 3/6: in class-date tentative
Quizzes	20%	Final Exam	30%: Wednesday 5/15: 3:30pm-5:30pm

*At the end of the semester, letter grades will be assigned according to the following scale:

A+ = 97 and up	A = 93-96	A- = 90-92	B+ = 87-89	B = 83-86	B- = 80-82	
C+ = 77-79	C = 73-76	C- = 70-72	D+ = 67-69	D = 63-66	D- = 60-62	F = 0-59

Attendance

Attendance is required. After four absences, your grade will be lowered by one-third of a grade (e.g., A to A-, A- to B+, etc.). Also, arriving to class late or leaving early will count as partial absences. You are responsible for whatever work is covered in class ***whether or not you are there***.

Absence from quizzes, the midterm, and the final exam will be excused only for a well-documented reason. The decision to allow a make-up will be made in accordance with the policies of Adelphi University.

If you need to be absent for any class meetings due to religious observance, please notify me within the first two weeks of the semester.

Disabilities

If you have a disability that may impact your ability to carry out assigned course work or complete quizzes and exams, and are not already enrolled in the Learning Disabilities Program, it is important that you contact the staff in the Disability Support Services Office (DSS), University Center, Room 310, (516) 877-3145, DSS@adelphi.edu. If you have a physical, medical or learning disability and require accommodations, please notify the instructor and present appropriate documentation within the first two weeks of the semester.

Course Materials

Textbooks

There are two textbooks for this course. Both are required.

- Peck and Devore, *Statistics: The Exploration and Analysis of Data*, Seventh Edition, 2012
- Carver and Nash, *Doing Data Analysis with SPSS Version 18*, 2012

You need the current edition of each text for this course, so do not purchase earlier editions of either text.

You can purchase these two books as a package at the bookstore. You can also purchase an electronic version of Peck and Devore from ichapter.com for a reduced price.

You need to bring the Carver and Nash text to each class meeting.

SPSS

- As requested by other departments, we will be using the SPSS statistical software package in this course.
- **You should not purchase SPSS on your own.** SPSS is very expensive software, and there are open source (free) alternatives to SPSS available for statistical analysis outside of this course.
- Adelphi has a license for SPSS, and the software is available on computers throughout the campus, particularly in the Swirbul Library. Please use the university's resources to complete your SPSS-based assignments.
- For course assignments where you are allowed or required to use SPSS, it will be specified in the assignment. When it is not specified, you are required to do the assignment without SPSS.
- Learning to use SPSS software is a key objective of this course. Therefore, you will be required to do some classwork and homework exercises in SPSS. Doing these exercises any other way, including by hand or with a program like Microsoft Excel, will result in a *grade of zero* for those exercises.
- Since all course exams and quizzes are closed-book and closed-computer, you will not use SPSS on them.

Moodle Learning System

- To access Moodle, log on to your eCampus account, then click on the Moodle tab.
- All grades (for assignments, quizzes, and exams) will be posted to Moodle.
- Course materials (such as PowerPoint presentations, assignments, and assignment solutions) will be posted to Moodle.
- Assignments can be submitted through Moodle. This may be necessary due to an absence or when the assignment requires the submission of SPSS files.

Course Expectations

Since this course meets for three credit hours per week, it is expected that on average you do at least 3-6 hours of work for this course per week outside of class time.

Reading Assignments

Lectures will not cover everything you need in order to complete the homework assignments. While the class meetings will highlight the important parts of the material, there will not be time in class to cover all of the material in each reading assignment in detail. Therefore, having access to, *and reading*, the textbooks is an essential component of this course. I do not expect you to understand everything in the reading assignments. I do, however, expect you to ask me questions about anything that you do not fully understand in a reading assignment, either by email, in office hours, or during the lecture covering that material. You are expected to complete all reading assignments *before* the class session covering those sections.

Required Homework Exercises

In addition to the reading assignments, required homework exercises will be assigned at most class meetings. Required homework exercises are due at the start of class on the Monday of the week after they are assigned, unless announced otherwise, either on paper or through the Moodle Learning System (see below). **Late homework will not be accepted for credit.**

Homework is an essential part of any course in mathematics, including statistics. **You learn math by doing math.** Completing your homework is also the best way to study, as it gives you an indication of the types of problems that will be on the quizzes and examinations. Give your homework the time it deserves! *You should do additional exercises from the two textbooks, not just the required ones.*

I encourage you to ask me questions about homework exercises, by email or during office hours. However, for Required Homework Exercises, I will only give a hint on how to start or where in the textbooks to refer to. I will not solve any Required Homework Exercise for you, prior to collecting it for grading. With that said, I will be glad to guide you through the solution to any exercise that is not a required homework exercise.

In general, I cannot allot class time to the review of homework. However, I will post the answers, and in some cases sample solutions, to the Required Homework Exercises on Moodle, within one week after the homework due date. For further review of graded homework, please attend my office hours.

Assignments Grading

Assignments count for 30% of the semester grade. A small part of this will be for in-class SPSS exercises. Most of this will be for the grades on the Required Homework Exercises.

Some Required Homework Exercises will involve doing calculations to arrive at the correct answer. You need to show your work, not just the correct answer, to receive full credit. Other exercises will require you to use SPSS, and you will need to submit the SPSS files on Moodle. Also, you will have exercises that involve providing a verbal answer or explanation. The grades for those exercises will be based on the accuracy and completeness of your responses.

While this is not a writing course, you should use correct spelling and grammar when completing assignments. When answering a question, or part of a question, that does not involve doing calculations, you need to write in full sentences. If you have difficulty with spelling and grammar, you should use the spell check and grammar check features on a word processor, like Microsoft Word, to complete the verbal parts of your assignments. However, your grade will not be lowered for poor writing, spelling, or grammar if the content of what you are trying to say is clear.

Academic Honesty

You are expected to be familiar with, and follow, Adelphi University's Honor Code and its policies on Academic Honesty, which can be viewed on the web at http://academics.adelphi.edu/policies/honesty.php. Violations of these standards, including (but not limited to) plagiarism of any portion of an assignment or misconduct during quizzes and examinations, will be dealt with in accordance with University regulations and procedures.

No credit will be given to student assignments, or portions thereof, that are substantially similar. I will not try to figure out who copied from whom; it is *your* responsibility to not let anyone copy your homework.

Student Course Evaluations

About 2 weeks before the start of Final Exams, the course evaluation will become available to you on eCampus. Availability will end just before the first day of Final Exams. Your feedback is valuable to me in making improvements to the course for future students. Please be assured that your responses are anonymous and that the results will not be available to me until after your final course grades are submitted to the University.

Course Topics (Tentative)

1. The Role of Statistics and the Data Analysis Process
2. Collecting Data Sensibly
3. Graphical Methods for Describing Data
4. Numerical Methods for Describing Data
5. Bivariate Data: Scatterplots and Correlation
6. MIDTERM EXAM
7. Basic Probability and Population Distributions
8. Sampling Variability and Sampling Distributions
9. Estimation Using a Single Sample
10. Hypothesis Testing Using a Single Sample
11. Comparing Two Populations or Treatments
12. Chi-Square Tests
13. Bivariate Data: Linear Regression
14. FINAL EXAM

STUDENT ACKNOWLEDGEMENT:
I HAVE READ AND UNDERSTOOD THE SYLLABUS FOR SPRING 2013 MTH 114-01

Signature: _____ Printed Name: _____ Date: _____