

MTH 114-02 (0144-114-002) Spring 2023 – Prof. A. Wittenstein

Statistics for the Natural Sciences (3 credits)

Contact Information

Office: Science 415

Email: Wittenstein@adelphi.edu

Course Web Page: <http://www.adelphi.edu/~wil6133/mth114/s23/>

Office Hours: Tuesdays 10:30-11am (Zoom) & 5:45-6:15pm (SWL 100), or by appt

Class Meetings

T/Th 4:30-5:45pm, Swirbul 100 (Tu 1/24 → Tu 5/9).

--T 3/14 & Th 3/16 Adelphi Spring Break – No Classes

--W 5/10 & Th 5/11 – Make-Up/Study Days

--T 4/25 Adelphi Research Day – No Scheduled Classes

--T 5/16: Final Exam – from 3:30-5:30pm

--If class time is missed for any reason (university weather closing, instructor unavailability, etc.), it will be made up on T 4/25 (Adelphi Research Day), W 5/10 & Th 5/11 (Make-Up/Study Days), and/or via online lessons/labs.

Prerequisite

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

Course Description

MTH 114 is a fast-paced introductory statistics course designed for students in science-oriented majors to:

- 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

- This course counts as a “Formal Sciences Distribution Course”.
- This course satisfies the University Learning Goal in “Quantitative Reasoning”.

Course Learning Goals & Objectives

Throughout the course, students will:

- Communicate statistics effectively, both orally and in writing.
- Apply statistical concepts to the development and evaluation of data, especially in the natural sciences.
- Utilize SPSS statistical software in the analysis of data, especially in the natural sciences.

During the units of the course, students will:

- Create graphical displays (i.e. histograms)
- Find numerical summary measures (i.e. mean, range, IQR).
- Calculate basic probabilities, z-scores, and t-scores.
- Calculate and interpret confidence intervals.
- Conduct hypothesis tests (i.e. single and paired sample t-tests, chi-square, ANOVA)
- Calculate and interpret linear regression models

Grading

Assignments 30% Midterm Exam 20%: Thursday 3/9: in class-date tentative

Quizzes 20% Final Exam 30%: Tuesday 5/16: 3:30pm-5:30pm

The final course grade corresponding to each final numerical course grade will be no lower than:

A+ = 97 & up	A = 93-96.9	A- = 90-92.9	B+ = 87-89.9	B = 83-86.9	B- = 80-82.9
C+ = 77-79.9	C = 73-76.9	C- = 70-72.9	D+ = 67-69.9	D = 63-66.9	D- = 60-62.9
					F = 0-59.9

Course Materials

Textbooks

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

- *Understandable Statistics with WebAssign*, Brase and Brase (13th edition), ISBN: 9780357719190
- *How to Use SPSS*, Brian Cronk (11th edition), Print ISBN: 9780367355692, eBook ISBN: 9781000682175

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

You need to bring the *How to Use SPSS* text to each class meeting (or have access to the eBook).

Graphing Calculator

- Each student must have a Texas Instruments (TI) 84 for their own use during this course.
- Students will not be allowed to share or borrow calculators during labs, quizzes, or exams for any reason!

SPSS

- As requested by other departments, we will be using the SPSS statistical software package for 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 Library. Please use Adelphi'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 many in-class and homework exercises in SPSS. Doing these exercises in any other way, including by hand, by calculator, or with a program like Microsoft Excel, will result in a *grade of 0* for those exercises.
- Since all course exams and quizzes are closed-book and closed-computer, you will not use SPSS on them. However, you may be given SPSS output and asked questions about it on quizzes and exams.

Moodle Learning System

- To access Moodle, log on to your eCampus account, then click on the Moodle tab.
- All lecture PowerPoint slides, assignments, and assignment solutions, will be posted to Moodle.
- Help for students in the use of Moodle can be found at <https://www.adelphi.edu/it-services/moodle/>
- Students are to monitor Moodle announcements or their Adelphi Gmail for any schedule changes (assignment or quiz/exam date changes, instructor running late, etc.) If a class meeting is cancelled or postponed for any reason, log on to the class Moodle page for instructions and assignments (if any).
- Some assignments, especially those involving SPSS files, will need to be submitted through Moodle.

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.). You are also responsible for whatever work is covered in class ***whether or not you are there***. Absence from quizzes and exams will be excused only for a good and **well-documented** reason. The decision to allow a make-up quiz or exam will be made in accordance with the policies of Adelphi University.

Please arrive to class *on time* whenever possible. Also, lateness or leaving early will count as partial absences. But, I would much rather you arrive late or leave early, than miss an entire class session. If you know in advance that you will be absent or late for a class, please e-mail me to let me know. 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.

If I know in advance that I will be absent or late for a class, then I will post this information to Moodle, and Moodle will automatically send an e-mail to your Adelphi e-mail account. ***In the rare case that I am not there at the start of class and there is no announcement on Moodle or the classroom door, then you should wait in the classroom until at least 4:55pm, as I am probably just running late.***

This is a Traditional In-Person class, and most (70%-100%) class meetings will be in-person. On occasion, the class may meet synchronously on Zoom (when announced in advance on Moodle/AU e-mail by the professor).

Classroom Policies

- Students are not to use phones or computers during class, except for tasks directly related to the lesson, like note taking and accessing the PowerPoint being discussed. *Students not following this policy may be asked to leave class for the day, in which case they will be marked absent for the day.*
- Assignments are not to be worked on and not to be submitted during class time. *All assignments with a time stamp during class time (T/Th 4:30-5:45pm) will be given a grade of ZERO.*

Course Tutors

The Department of Mathematics and Computer Science will provide free tutors for this course on the fourth floor of the Science Building. More information will be posted on Moodle during the 1st or 2nd week of the semester.

It is departmental policy that: “Tutors should never assist students on take-home tests, quizzes, or graded homework assignments; instead, they should work on practice problems that help students review key procedures and concepts to prepare for the assignment.”

Religious Observance

Adelphi University welcomes diversity in its community, and respects various religious observances. Students who anticipate being absent, due to their religious observance, are required by Adelphi to notify their professors at the start of the semester. This will allow the faculty to take these observances into consideration in light of their course exam and assignment schedules. Students absent from class on those days, after prior notice to the professor, will not be penalized for any exam or assignment deadline missed because of those absences. Students must contact the instructor to work out suitable arrangements for make-ups or other satisfaction of academic requirements.

COVID-19: Course Mask Policy

For Spring 2023, Adelphi University has a mask-optional policy in most public spaces. Please continue carrying an acceptable face covering with you in case you are asked to wear one. Free masks are available **in various locations** at Adelphi. We appreciate your support of every individual's choice & comfort level about masking.

The policy for this class at the present time is ***mask optional***. If necessary during the semester, I will announce any change to this by Moodle/AU e-mail.

COVID-19: In the Event of Illness or Quarantine

Should you test positive for COVID-19 or be required to undertake a quarantine or isolation period, please take the following steps as soon as possible:

- Contact the Health Services Center at **516.877.6003** or **healthandwellness@adelphi.edu** for further guidance.
- Contact me by e-mail (Wittenstein@adelphi.edu) to discuss arrangements for completing coursework and possible attendance by ZOOM while absent from class due to COVID-19.

Course Topics with Approximate Timeline

1. Weeks 1-3: Understanding, Displaying, and Summarizing Data (Brase Chapters 1-3, Cronk Chapters 1-3)
2. Weeks 4-6: Probability, Normal Curves, and Sampling Distributions (Brase Ch.4-6, Cronk Section 3.5)
3. Week 7: Review and Midterm Exam
4. Week 8: Confidence Intervals for Estimating the Population Mean (Brase Chapter 7)
5. Weeks 9-10: Hypothesis Testing of the Population Mean (Brase Chapter 8, Cronk Sections 6.1-6.4)
6. Weeks 11-12: Correlation and Linear Regression Theory (Brase Chapter 9, Cronk Sections 5.1-5.3)
7. Week 13: Chi-Square Distribution (Brase Sections 10.1-10.2, Cronk Sections 7.1-7.2)
8. Week 14: Catch Up and/or Additional Topics if time permits:

Other Types of Regression: multiple, non-linear, logistic

Non-parametric tests of significance: Mann-Whitney, Wilcoxon, Kruskal-Wallis, Friedman

9. Week 15: Review and Final Exam

*A day-by-day calendar can be found on Moodle. This calendar will be updated throughout the semester as dates may shift, such as when a topic which is planned for 1 day actually takes 2 days, or vice-versa.

Course Assignments

Since this course meets for three credit hours per week, it is expected that on average you do about 4-6 hours of work for this course per week outside of class time. If you are spending significantly less time and not doing well, do NOT be surprised. But, if you are spending significantly more time and not doing well, please see me.

Reading Assignments

While the class meetings will highlight the important parts of the material, you are expected to read the Brase textbook as well, as it provides additional examples and explanations of the material. *Quizzes and exams will assess understanding of classroom and textbook material. So, make sure to ask about anything you do not fully understand prior to each assignment due date, quiz, or exam.*

Graded Assignments

Be sure to prepare for these assignments by first completing the reading assignments. Assignments will be graded for accuracy and completeness, not just on whether they were attempted. Late assignments will be penalized 10% per calendar day (including weekends and holidays). However, if the instructor is notified in advance that an assignment will be late for a valid reason (starting the assignment too late, not knowing how to do an assignment, and/or computer trouble on or near the due date are NOT valid reasons), the late penalty may be reduced or eliminated. Also, late submissions may not be accepted for any credit once grading and/or post-mortem feedback have been provided to the class and/or any of its students for a particular assignment.

Most assignments will be submitted through WebAssign. Some assignments 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.

In general, class time cannot be allotted to the post-mortem review of homework. For review of graded homework, please attend my office hours or see the course tutors.

Statistical Lab Reports

There will be two lab reports assigned this semester. You must work on these labs independently! Directions for the lab reports will be handed out at a later date. **Late reports will not be accepted.**

Lab reports are to be typed. *All answers are to be in full sentences with correct spelling and grammar.*

Assignments Grading

Assignments count for 30% of the semester grade. A small part of this will be for in-class exercises (often involving SPSS). Most of this will be for the Lab Reports & the (weekly) assignments on WebAssign.

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 work.

Academic Honesty

Students enrolled in this course are expected to abide by 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>. The purpose of the Honor Code is to protect the academic integrity of the University by encouraging consistent ethical behavior in assigned coursework by students. The following is excerpted from the Student Honor Code:

The code of academic honesty prohibits behavior, which can broadly be described as lying, cheating, or stealing. Violations of the code of academic honesty will include, but are not limited to, the following:

1. Fabricating data or citations
2. Collaborating in areas prohibited by the professor
3. Unauthorized multiple submission of work
4. Sabotage of others' work, including library vandalism or manipulation
5. Plagiarism: presenting any work as one's own that is not one's own
6. The creation of unfair advantage
7. The facilitation of dishonesty
8. Tampering with or falsifying records

9. Cheating on examinations through the use of written materials or giving or receiving help in any form during the exam, including talking, signals, electronic devices, etc.

Violations of these standards, including (but not limited to) plagiarism of any portion of an assignment or misconduct during quizzes & exams, will be dealt with in accordance with University regulations & procedures and reported to the Provost's office.

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 the Final Exam Period. 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.

Student Access Office:

<https://access-office.adelphi.edu/sao@adelphi.edu> (516) 877-3806 Post Hall 107

If you have a disability that may significantly impact your ability to carry out assigned coursework, please contact the Student Access Office (SAO) at 516-877-3806 or send an email to sao@adelphi.edu. The staff will review your concerns and determine, with you, appropriate and necessary accommodations. Please allow for a reasonable time frame for requesting ASL Interpreters or Transcription Services. All information and documentation of disability is confidential.

The Student Counseling Center (SCC):

<https://students.adelphi.edu/catalog/counseling-services/scc@adelphi.edu> (516) 877-3646 Nexus 132

Provides confidential and professional psychological counseling services, resources, and referrals to support the academic and personal success, health, and well-being of Adelphi students without additional charge. Counselors are available to help students cope with a variety of stressors and personal issues that may interfere with their academic and personal experiences. The Center also supports students who may be feeling suicidal or in crisis.

Need support when the SCC is not available? Get Help: <https://scc.adelphi.edu/contact/>

For 24/7 emergency counseling, referral, or assistance, please contact:

Long Island Crisis Center (516) 679-1111 **911** (for immediate health-related emergency)

National Suicide Prevention Lifeline (800) 273-TALK (8255)

Public Safety: Off campus: (516) 877-3500, On campus: Extension 5

Learning and Writing Centers:

<https://adelphi.edu/learning-writing-centers/> learningcenter@adelphi.edu (516) 877-3200 Nexus 132

The Learning and Writing Centers comprise a single department and student support service, with missions rooted in helping students achieve academic success. Services, delivered via fellow peers working as student tutors, are centered around providing academic support and engagement outside of class and are free to all Adelphi students.

Learning Center tutors mainly focus on specific academic areas — like Biology, Nursing, Accounting, or Computer Science — while the Writing Center tutors focus on writing, across all academic disciplines and across the entire writing process—from thesis construction, research, and organization to grammar, language, and citation.

STUDENT ACKNOWLEDGEMENT:

I HAVE READ AND UNDERSTOOD THE SYLLABUS FOR SPRING 2023 MTH 114-002

Signature: _____ Printed Name: _____ Date: _____

Any days you will need to miss class: _____ Allergies: _____

Learning Accommodations: _____