| Statistics I/ Intermediate Statistics*Updated Sep 2, 2021*  |
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| Course: GSR – 708.00/ SOC 425.01Hunter CollegeFall 2021Th- 5:35 pm - 7:25 pm via Zoom  | Instructor: Nga Than Office Hours: Thu - 2-3 pm via Zoom & by appointment Email: nthan@gradcenter.cuny.edu |

**Zoom link** (class hours & office hours) **:** <https://huntercollege.zoom.us/j/85780219052>

**COURSE DESCRIPTION**

This course introduces students to the basics of statistics which is essential to understand research in the social and behavioral sciences. Throughout the modules, students will learn how to effectively make use of data in the face of uncertainty, how to collect data, how to analyze data, and how to use data to make inferences and conclusions about real world phenomena.

**LEARNING OUTCOMES**

* Be able to analyze quantitative data using a number of descriptive statistics
* Become versed in inferential statistics
* Learn basics of statistical programming (R- language)

**REQUIRED BOOKS:**

Ismay, C., & Kim, A. Y. (2019). *Statistical inference via data science: a ModernDive into R and the tidyverse*. CRC Press. <https://nustat.github.io/intro-stat-ds/index.html>

Extra Texts: Blackboard

**COURSE REQUIREMENTS**

**Grades:**

| **Items** | **Date** | **Weight (%)** |
| --- | --- | --- |
| 4 Homework Assignments  | Varies  | 20.0 |
| 3 Mini Projects  | Varies  | 30.0 |
| Data Set & Research Proposal  | Nov 18 | 10.0 |
| Final Research Paper  | Dec 20  | 40.0 |

The grading system in this class is as follows:

| A+ | 97-100 |
| --- | --- |
| A | 93-96 |
| A- | 90-92 |
| B+ | 87-89 |
| B | 83-86 |
| B- | 80-82 |
| C+ | 76-79 |
| C | 74-75 |
| C- | 70-73 |
| D | 60-69 |
| F | <=59 |

***Attendance/class participation***

Regular attendance is one of the most important parameters to successful completion of the course requirements. I expect that you read the required readings before class, and participate in classroom discussions.

***Homework Assignments***

In the first four weeks, you will be asked to complete DataCamp assignments from the Introduction to R, Introduction to Tidyverse, Introduction to Visualization in ggplot2, and Introduction to Regression in R courses. You will get an email by the end of the first day of class inviting you to join our class organization with an assignment. Each assignment is a course. These assignments are graded based on completion. After you complete each assignment, DataCamp will issue a certificate of completion. You should upload these certificates on Blackboard. Each assignment is worth 5 points.

***Mini-projects***

In the mini-projects, you will apply the concepts you learned to complete data analysis tasks. You will get one mini-project every other week in the second half of the semester.

* MP 01 (10 %) will hone your skills in data visualization skills
* MP 02 (10 %) will showcase your skills in basic modeling
* MP 03 (10 %) will showcase your knowledge in advanced inferential statistics

***Final Research Paper***

Students will investigate one social problem/issue using a real world dataset. To prepare for the final research paper, students should submit a real world dataset and a research proposal.

* Data Set: choose any real world data set for a social problem (General Social Survey, American Community Survey, American Census, Ipums, etc)
* Research Proposal: Write a paper about ONE research question you find interesting and use data visualization and analysis to support your exploration.

Two weeks after you submit the research proposal and dataset, you will do a 5 minute in-class presentation to show the progress of your research project. The final paper will be due at midnight on December 20, 2021.

**Hunter College Policy on Academic Integrity**

Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic

**Hunter College Policy on Sexual Misconduct**

In compliance with the CUNY Policy on Sexual Misconduct, Hunter College reaffirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationships. Students who have experienced any form of sexual violence on or off campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College. a. Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline (646-610-7272) or their local police precinct, or contacting the College's Public Safety Office (212-772-4444). b. All Other Forms of Sexual Misconduct: Students are also encouraged to contact the College's Title IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or 212-650-3262) or Colleen Barry (colleen.barry@hunter.cuny.edu or 212-772-4534) and seek complimentary services through the Counseling and Wellness Services Office, Hunter East 1123. CUNY Policy on Sexual Misconduct Link: https://www.cuny.edu/wp-content/uploads/si

 **ADA Policy**

In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical, and/or Learning) consult the Office of AccessABILITY, located in Room E1214B, to secure necessary academic accommodations. For further information and assistance, please call: (212) 772-4857 or (212) 650-3230.

**COURSE SCHEDULE**

Aug - 26: Introduction – Why Stats?

* Syllabus
* Introduction to R
* Setting up R for the course
* [First day of class survey](https://forms.gle/g9U8ZSK6rPQdHKk76)

Sep – 2: Getting started with R

Reading: <https://nustat.github.io/intro-stat-ds/1-getting-started.html>

📚📚HW1: DataCamp - Introduction to R (upload course certificate on BB by Sep - 10)

Sep – 9: Data Visualization & Data Wrangling

Reading: <https://nustat.github.io/intro-stat-ds/2-viz.html>

Data Wrangling Part 1

Reading: <https://nustat.github.io/intro-stat-ds/3-wrangling.html>

📚📚HW2: DataCamp - Introduction to Visualization in ggplot2 (Upload course certificate on BB by Sep 23)

*Sep - 14: Last day to drop the course without a “W” appearing on your transcript*

Sep 16: No Classes scheduled!

Sep – 23: Data Wrangling Part 2 & Data Importing & Tidy Data

Reading: <https://nustat.github.io/intro-stat-ds/3-wrangling.html>

Reading: <https://nustat.github.io/intro-stat-ds/4-tidy.html>

📚📚HW3: DataCamp - Introduction to Tidyverse (Upload course certificate on BB by Sep 30)

Sep – 30: Basic Regression

Reading: <https://nustat.github.io/intro-stat-ds/5-regression.html>

📚📚HW4: DataCamp - Introduction to Regression in R (Upload course certificate on BB by Oct 7)

Oct – 7: Multiple Regression

Reading: <https://nustat.github.io/intro-stat-ds/6-multiple-regression.html>

📈📈 Mini-projet 1 (Due Mid-night Oct-14 on BB)

Oct- 14: Randomization & Causality

Reading: <https://nustat.github.io/intro-stat-ds/7-causality.html>

Causal inference basics and randomized experiments (on Blackboard)

Antonakis, J., Bendahan, S., Jacquart, P., & Lalive, R. (2010). On making causal claims: A review and recommendations. The leadership quarterly, 21(6), 1086-1120. <https://www.sciencedirect.com/science/article/pii/S1048984310001475>

Elliott-Negri, L., Tu, S., Zheng, W., & Lennon, M. C. (2021). Hope, Emotional Charges, and Online Action: An Experimental Study of the DREAM Act. *Social Problems*. <https://academic.oup.com/socpro/advance-article/doi/10.1093/socpro/spaa076/6086023?casa_token=YbXjB_Bu8_sAAAAA:yHtP6B_flQqcVxY4MF4s_p0n6TbOqGmQjMAlvMGorRdW3br-NpQ-ssslmMsezPogOaTMxfy98VOlpg>

Oct 21: Populations & Generalizability

Reading: <https://nustat.github.io/intro-stat-ds/8-populations.html>

📈📈 Mini-projet 2 (Due Mid-night Oct 28 on BB)

Oct 28 - Sampling Distributions

Reading: <https://nustat.github.io/intro-stat-ds/9-sampling.html>

Nov - 4: Confidence Intervals

Reading: ​​<https://nustat.github.io/intro-stat-ds/10-CIs.html>

📈📈 Mini-projet 3 (Due Mid-night Nov 11 on BB)

Nov 11: P-values

Reading: <https://nustat.github.io/intro-stat-ds/11-pvalues.html>

📌 [Data Set & Research Proposal](https://ngathan.com/GSR_708/Data_Proposal.pdf) (Due - midnight Nov 18 on BB)

Nov 18: Hypothesis Tests & Putting it all together

Reading: <https://nustat.github.io/intro-stat-ds/12-hypothesis-tests.html>

Nov 25: 🍂🍂🍂 Thanksgiving Day - College is closed

Dec – 3: Presentations & Wrap-up [ 🔥 Lightning presentation: 10 minutes per person]

Dec – 9: Presentations & Wrap-up [ 🔥 Lightning presentation: 10 minutes per person]

Dec – 20: 📌 Final paper due