

Data Science Translation

APSTA-GE 2355 | Spring 2023 | 3 credits

Meeting pattern:

Monday, 2 - 4:30 pm

Classroom: 194 Mercer, Room 305

Class meets **in person**; if you can't attend in person contact the professor ASAP

Course Title:

Data Science Translation: Writing, Speaking, and Visualization

Number of Credits: 3

Instructor:

Kate Schwartz

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Office hours: by appointment

Course Description:

The goal of this course is to learn how to effectively, honestly, and persuasively communicate about empirical research. Students will develop new competencies in writing, visualization, and oral presentation of technical material with particular focus on communicating to lay audiences. Practical strategies will be taught with ample opportunity to practice new skills. Students will receive feedback from the instructor and fellow classmates. Concision, accuracy, and clarity of communication will be stressed (as well as how compelling the material is in your delivery of it); the tension (e.g., simple enough to understand but still accurate) between achieving these goals will also be explored.

Course Prerequisites:

- **REQUIRED:** One semester of Statistics or Data Science (examples include *but are not limited to* APSTA-GE 2003 and DS-GA 1001).
- **High level of comfort** with some statistical software package (R, Python, Stata). Willingness to learn methods in R or Tableau.

Learning Objectives:

Upon completion of the course, students will be able to

- 1) understand guiding rules that create clear and concise writing;
- 2) understand the principles behind honest and effective visualizations;
- 3) understand best practices in live presentations;
- 4) provide helpful feedback to others' writing, visualizations, and presentations,

- 5) present basic statistical concepts in a clear and helpful manner;
- 6) achieve a deeper conceptual understanding of basic statistical principles through practice communicating about them to a non-technical audience; and
- 7) achieve a deeper conceptual understanding of a particular statistical method or concept by communicating about them to a non-technical audience

Electronic Devices

As a professor, I have a no devices policy. This is because I take a very interactive/discussion based approach to teaching, which devices often impede. I know that I find it difficult to not be distracted by other alerts and tabs (and thus less engaged) when using my laptop in classrooms/meetings and also that having others be on their screens doing something is a distraction for those around them (research supports this: see [Dynarski, 2017](#)). If you need special accommodations (i.e., have to use a device for note-taking for accessibility reasons) or have something personal happening where for one day you need to be aware of possible phone alerts during class time, please let me know. Otherwise phones should be silent and away and you should come prepared with paper and pens/pencils for in class writing time.

Course Format: (Lecture, lab, seminar, recitation or combination)

2.5 hours of class time per week. Some of the class time will be spent in a lecture format. The rest of the class time will be spent in active learning including: 1) writing, 2) critiquing examples of writing, visualization, and presentation; 3) building visualizations, 4) practicing giving oral presentations, 5) giving and receiving feedback on written, visual, and presentation products/skills. Students will be expected to be intellectually engaged and respectful to all classroom participants. An example class structure is described next although the structure will vary from week to week.

Example class structure:

- 1) (15 minutes) Respond to a prompt, plan a visualization, or outline a brief presentation
- 2) (10 minutes) Share and discuss the in-class assignment with a partner or small group
- 3) (10 minutes) Class discussion about the in-class assignment
- 4) (15 minutes) Revisiting the class weekly (out-of class) assignment
- 5) (20 minutes) Student or instructor presentation(s).
- 6) (30 minutes) Class activity or lecture
- 7) (10 minutes) Discussion of class activity
- 8) (10 minutes) Introduction to out-of-class assignment.

Required readings and assignments for each week will be described in the appropriate week-specific folder under Lessons on the Brightspace page for the course at least one week prior to each class.

Course Requirements

The grade for this course will be determined as follows:

1. In-class work (20%), assessed by class attendance and (when applicable) in class assignments turned in after class. If you need to miss class contact me beforehand so I can determine the best way for the work to be made up. All make-up work needs to be completed within one week of the missed class. If you have more than two unexcused absences classes you will receive a 0 for in-class work for the semester (except under exceptional circumstances).
2. Peer feedback (20%), assessed by regularly and diligently completing peer assessments and by performance on end-of-semester peer evaluations on full draft of project.
3. Out-of-class homework assignments (30%), assessed by regular completion and demonstrating evidence of progress toward assigned goals.
4. Final project (30%), assessed by associated rubric).

Assignments

Possible In/Out-of-class activities/assignments:

- 1) An example will be provided of a piece of writing, visualization, presentation, etc. and you will be asked to
 - a) Write a summary
 - b) Present a critique
- 2) Write a detailed explanation of a statistical concept for a family member or friend who does not work in research (i.e., an accessible and jargon-free distillation of the essence of the student's work)
- 3) Write a 1-paragraph explanation of a statistical concept for an intro statistics student
- 4) Revise a poorly written paragraph to be more clear and concise
- 5) Write the opening paragraph of a blog post
- 6) Draw a sketch of a plot to display the results currently displayed in a table
- 7) Make a plan for a 3 slide presentation on a specific introductory statistics topic

Final project

We will spend the semester building towards completion and refinement of the final project. The final project will combine writing, visualization, and presentation skills. All three components will address a common statistical topic (e.g., propensity score matching, item response theory) as applied to real data/topics. The project will consist of the following deliverables (a more detailed description with a rubric will be provided in a few weeks), all of which need to be geared toward a non-technical audience:

1. 5-6 page manuscript on methods and results (12 pt Times New Roman, 1.15 spacing) that includes 3-4 supporting visualizations (included in page count)
2. 6-minute (strictly timed!!) presentation targeting the same material
3. Feedback on 2 other classmates' projects

4. 1-page discussion of how the project evolved between the initial draft and final product

Required and Recommended Readings (a partial reading list is acceptable)

The only **required** book is

Williams, Joseph M. and Bizup, Joseph (2017) *Style: Lessons in Clarity and Grace*, 12th edition, Pearson Education.

I also highly **recommend**

Schwabish, Jonathan (2017) *Better Presentations: A Guide for Scholars, Researchers, and Wonks*, New York: Columbia University Press.

Pinker, Steven (2014) *The Sense of Style: The Thinking Person's Guide to Writing in the 21st Century*, New York, NY: Penguin.

Additional book chapters, journal articles, and other materials will be provided via Brightspace under weekly topics. Please check the Brightspace page for all readings/out of class assignments. Assignments and readings will be posted no later than a week before they are due (for longer assignments more time will be given).

In addition the following books are recommended resources for students who want to learn more about selected topics:

- Kahneman, Daniel, Slovic, Paul, and Amos Tversky, eds. (1982) *Judgment Under Uncertainty: Heuristics and Biases*
- Chang, Winston (2012) *R Graphics Cookbook: Practical Recipes for Visualizing Data*, 1st Edition
- Graff, Gerald and Birkenstein, Cathy (2014) *They Say, I Say: The Moves that Matter in Academic Writing (3rd edition)*, New York, NY: W. W. Norton and Co.
- Tufte, Edward R. (2001) *The Visual Display of Quantitative Information (2nd edition)*, Cheshire, CT: Graphics Press.
- Goldberg, Natalie (2016) *Writing down the bones: Freeing the Writer Within* (2018)

Late/absence policy:

*If students are late or miss class they have to turn in any missed work (due in class or performed in class) **by the next class**.*

Academic Integrity:

All students are responsible for understanding and complying with the New York University Steinhardt School Statement on Academic Integrity. A copy of this statement is available at: http://steinhardt.nyu.edu/policies/academic_integrity. I will be explicit about what work can be done in a group and what work needs to be done individually. It's good to get feedback and learn from others. On the other hand you are learning this material so that you can go out in the world

and write, create visualizations, and give presentations on your own. Don't cheat yourselves of this opportunity. If you have any question about what is an appropriate amount of contribution for each participant in a joint piece of work please don't hesitate to ask me.

Students with Disabilities:

Students with physical or learning disabilities are required to register with the Moses Center for Students with Disabilities, 726 Broadway, 2nd Floor, (212-998-4980 and online at <http://www.nyu.edu/csd>) and are required to present a letter from the Center to the instructor at the start of the semester in order to be considered for appropriate accommodation.

Grading Rubric:

Letter grades will be assigned using the following criteria:

A= Excellent [90-100% of points available in a given assignment category/ 93.66 required for an A versus an A-]

This work is comprehensive and detailed, integrating themes and concepts from discussions, lectures and readings and offering valuable original insight. Writing is clear, analytical and organized. Arguments offer specific examples, incorporate relevant literature, and concisely evaluate evidence. Students who earn this grade are prepared for class, synthesize course materials, contribute insightfully, and craft salient techno-ethical scholarly contributions.

B=Good [80-89.9% of points available in a given assignment category/ 83.66 and below is a B- and 87.4 and above is a B+]

This work is complete and accurate, offering insights and competent understanding. Writing is clear, uses examples properly and tends toward broad analysis. Classroom participation is thoughtful and frequent.

C=Average [70-79.9% of points available in a given assignment category/ 73.66 and below is a B- and 77.4 and above is a B+]

This work is correct but largely regurgitates readings, lacking synthetic analysis. Writing is vague and fails to completely address the key questions. Arguments are unorganized, without specific analysis. Classroom participation is lacking or inarticulate.

D= Unsatisfactory [60-69.9% of points available in a given assignment category/ 63.66 and below is a B- and 67.4 and above is a B+]

This work is incomplete, and evidences little understanding of the readings or discussions. Arguments demonstrate inattention to detail, misunderstand course material and overlook significant themes. Classroom participation is spotty, unprepared and off topic.

F=Fail [<60%]