

Data Visualization (MSA 8020)

Instructor

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Class Location

Room 306, Buckhead
Campus

Class Time

Tue 3:00 to 5:45

Tue 7:00 to 9:45

Office Hours

WebEx appointment as
needed

Course Overview

We consume data in visual form every day, but few leave an impression. We can recall with ease our favorite stories, movie scenes, and songs, but most would draw a blank if asked about our favorite charts that influenced our decisions or understanding. This course is about making better and more impactful charts.

We will cover theory, design, and practices behind effective data visualization for achieving relevant goals. We will use data examples from business, health, sports, and arts to demonstrate and showcase the powerful visuals in these fields.

Programming languages Python and R as well as BI dashboard software Tableau are used to develop proficiency in designing and making good chart. We will also look at how errors and biases can be introduced into visualization and develop critical and reviewing skills for revising, improving, and presenting visual information. At the end, the course will help us become critical consumers of visual information.

The specific outcomes of this course span three key areas including principles of visual perception and design, data programming skills, and effective communications:

- Principles
 - Human perception of visual data
 - Design
 - Communication
- Programming Skills
 - Python Matplotlib, seaborn
 - R ggplot2 and graph grammar language
 - Tableau dashboards
- Effective communications
 - Critic of data visuals
 - From drafts to final visuals: revisions
 - Mindfulness and goal-oriented
 - Data visualization presentation skills

Required Text

Good Charts: The HBR Guide to Making Smarter, More Persuasive Data Visualizations, Scott Berinato, 2016. <https://www.amazon.com/Good-Charts-Smarter-Persuasive-Visualizations/dp/1633690709>

Data Visualization with Python, Dobler and Grobmann, 2019.
<https://www.amazon.com/Data-Visualization-Python-meaningful-interactive-ebook/dp/B07JPDMLF3>

Course Materials

Handouts, datasets, programs, galleries, and bibliography (to be distributed throughout the semester)

Resources

Optional Texts

- Good Charts: Tips, Tools, and Exercises for Making Better Data Visualizations, Scott Berinato, 2019.
- The Visual Display of Quantitative Information; Envisioning Information; and Visual Explanations. Trilogy on data visualization from Edward Tufte. Classics that blend principle, artistry, and examples.
- Now You See It, Steven Few
- Hadley Wickam's ggplot2 book
- Kirthi Raman, Mastering Python Data Visualization
- Tableau Your Data, Fast and Easy Analysis with Tableau Software, Daniel Murray
<https://tanthiamhvat.files.wordpress.com/2015/07/tableau-your-data.pdf>.
- Interactive Data Visualization for the Web, 2nd edition, Scott Murray. This book focuses on designing and delivering visualizations for the web through D3. No knowledge of HTML, CSS, and Javascript is assumed.

Web Sites

- Matplotlib (<http://matplotlib.org>), Seaborn (<https://seaborn.pydata.org/>), Python Tutorial (<https://docs.python.org/3/tutorial/>), ggplot2 (<https://ggplot2.tidyverse.org/>), Tableau (<http://tableau.com>)

Course Schedule

Week	Subject	Reading
Week 1	Introducing Data Visualization and Tools	Handout, GC (Good Charts) Chap 1 to 3, DVPy (Data Visualization with Python) pp. 1-84
Week 2	Creating Good Charts: A Simple Approach to Visualization with a Purpose	Handout, GC Chap 4, DVPy pp. 85-138. Optional: Matplotlib basic tutorials
Week 3	Refining for Better Charts	Handout, GC Chap 5 to 7
Week 4	Tinkering in Python, R, and Tableau	Handout, DVPy pp. 139-196. Optional: Matplotlib intermediate tutorials
Week 5	Presenting and Communicating	Handout, GC Chap 8 pp. 178-200
Week 6	Putting It All Together: Case Studies	Handout, GC Chap 8 pp. 200-206
Week 7	Final Exam and Presentation	

Project Schedule

Week	Subject
Week 1	Team Composition
Week 2	Data selection and scoping
Week 3	Draft and sketch review
Week 4	Revision review
Week 5	Final review and 1 st rehearsal
Week 6	Second rehearsal
Week 7	Final presentation

HW Assignments

I will assign weekly homework to be graded on a scale of 1 to 5. Feedback will be provided selectively.

Quizzes

We will have up to 4 quizzes. These are designed to spot check how we absorbed the content discussed in the previous week.

Grading

Homework	15%	Quiz	15%
Final	30%	Project	40%

Academic Honesty

The introduction section in GSU academic honesty policy states:

As members of the academic community, students are expected to recognize and uphold standards of intellectual and academic integrity. The University assumes as a basic and minimum standard of conduct in academic matters that students be honest and that they submit for credit only the products of their own efforts. Both the ideals of scholarship and the need for fairness require that all dishonest work be rejected as a basis for academic credit. They also require that students refrain from any and all forms of dishonorable or unethical conduct related to their academic work.

Please refer to the following link for examples of acts of academic dishonesty and ensuing procedures in the case when such acts are suspected and alleged (<https://deanofstudents.gsu.edu/files/2019/07/Academic-Honesty-Policy.pdf>).

In this class, except project work, all other graded components (including homework, quizzes, and final) are individual. In particular, homework assignments will be screened for likelihood of dishonest collaboration and plagiarism. You are expected to source your data and chart examples from the internet, please credit the source and provide the proper reference and citation to all content found online.