



## **INFO-GB 3106.10 - Data Visualization**

### **Syllabus**

Revised April 30, 2018

#### **Course overview**

Data visualization is an essential skill required in today's data driven world. With its foundations rooted in statistics, psychology, and computer science, practitioners in almost every field use visualization to explore and present data. This course shows you how to better understand your data, present clear evidence of your findings to your intended audience, and tell engaging data stories that clearly depict the points you want to make all through data graphics. The skills learned in this course offer enormous value for creatives, educators, entrepreneurs, and business leaders in a variety of industries. Whether you are a seasoned visualization designer or just learning about it now, this course will serve as an introduction and reference to becoming visual with data.

#### **Instructor**

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Office Hours: Thursdays, 3-5pm and by appointment.

#### **Course Meetings**

Thursdays from 6:00pm – 9:00pm

November 8 – December 20

Location: TBA

**IMPORTANT: This is a hands-on course. You will need to have your computer (Mac or PC) up to date to install, Tableau Desktop software (provided free to students in the class).** Also, some knowledge of basic programming (in any language) will be helpful, but not required. We will use several tools to refine our data and create, edit, alter, and display their visualizations. The primary tools we will be using in this class include: **Tableau Desktop and Excel. In addition, you may seek out opportunities to learn how to create visualizations in R, Google Charts, and plot.ly (please speak to the professor to arrange for this).** To learn these tools we will begin working with very small data sets. Since this is not a class on data analysis or models, you'll be expected to apply your prior knowledge learned about business analytics to the creation of beautiful data displays (using big or small data).

### **Learning outcomes**

- Present data with visual representations for your target audience, task, and data;
- Experiment with and compare different visualization tools;
- Create multiple versions of digital visualizations using various software packages;
- Identify appropriate data visualization techniques given particular requirements imposed by the data;
- Apply appropriate design principles in the creation of presentations and visualizations; and
- Analyze, critique, and revise data visualizations.

### **Course requirements and grading**

#### Assignments (40%)

There will be four individual assignments. The assignments will require you to work with data and use various technologies to create data visualizations.

Assignment 1 - due 11/15

Assignment 2 - due 11/29

Assignment 3 - due 12/6

## Assignment 4 - due 12/13

### Late assignments

Assignments submitted after the due date will lose an automatic 10 points and the feedback on your work will be significantly delayed. You may submit late assignments through 12/19. No late assignments will be accepted thereafter.

### Individual Project (40%)

The individual project is a presentation using data visualizations to tell a story to your audience. The project is a demonstration of your knowledge and fluency with data visualization techniques and tools. It is an opportunity for you to create a series of data visualizations based on your selected data source. You will create at least 4 visualizations based on your defined audience, data, and tasks. You will present visualizations to the class. The project is a demonstration of your effort, knowledge, and ability to tell an interesting story with data.

Project Pitch Due: 11/29

Project Due: 12/19 (no late projects accepted)

Project Presentation: 12/20

### Attendance, class participation, teamwork, collaboration, and class preparation (20%)

Students are expected to attend all classes, participate regularly in the large class discussion, and small group discussions. Part of this course involves working with others and seeking feedback from your peers on your in-class exercises. A large portion of the class requires you to work with data and visualization tools to create visual displays. There are regular online and in-class exercises to help you practice and learn the appropriate techniques. These exercises are short, but frequent. Your full participation is expected. This grade will be based the following: 1) attendance 2) online engagement (completing the online lessons that include video assessments, quizzes, etc. ) 3) participation during in-class discussions and activities.

## **Recording of classes**

Class lectures will be recorded automatically using MediaSite. The links will be posted to NYU Classes when they are available.

## **Readings and course materials**

Sosulski, K. (2018). *Data Visualization Made Simple: Insights into Becoming Visual*. New York: Routledge.

The other materials for this course are free. A set of seven interactive online lessons created by the professor provide the articles, videos, and data for the course. These can be found on NYU Classes > Data Visualization > Lessons.

## **Optional readings**

Few, S. (2012). *Show me the numbers: Designing tables and graphs to enlighten*. Burlingame, CA: Analytics Press.

Few, S. (2006). *Information dashboard design: The effective visual communication of data*. Sebastopol: O'Reilly.

Ware, C & Kaufman, M. (2008). *Visual thinking for design*. Burlington: Morgan Kaufmann Publishers.

Wong, D. (2011). *The Wall Street Journal guide to information graphics: The dos and don'ts of presenting data, facts and figures*. New York: W.W. Norton & Company.

Yau, N. (2011). *Visualize This: The FlowingData Guide to Design, Visualization, and Statistics*. Indianapolis: O'Reilly.

Yau, N. (2013). *Data Points: Visualization that means something*. Indianapolis: O'Reilly.

## Required software

The major graphics tools we will be using in this course for creating visualizations are Excel and Tableau. You must have both applications installed. You must have a computer you can bring to class. You must have a computer that allows you to install additional software (you should have administrator access to your computer).

- Microsoft Excel, PowerPoint (Mac users are encouraged to use KeyNote), and a basic text editor such as Notepad or TextEdit.
- Tableau Desktop. Tableau's data visualization software is provided through the Tableau for Teaching program at <http://www.tableau.com/data-visualization-software>. Key: TDJ8-6A8B-9650-195F-CACC

## Optional software

- R and RStudio (additional libraries required): <http://www.r-project.org/>, <http://www.rstudio.com/> (**FREE**)
- Dreamweaver and/or an HTML editor
- Vector Graphics Editor: Adobe Illustrator CS5 or later or you can use a free open source vector graphic tool such as Inkscape (<http://inkscape.org/>)
- ThinkCell: Trial for PowerPoint: <https://server.think-cell.com/portal/en/trial.srf> (PC only)
- [plot.ly](http://plot.ly)
- Qlikview (PC only)

## Course Schedule

The course topics and dates are presented below. All readings, assignments, videos, etc. will be presented in NYU Classes for each week. There are video tutorials, cases, and exercises that you are required to complete on your own.

| Week      | Topics                                                                               | Material due                                                                               |
|-----------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| 1 - 11/8  | Introduction to data visualization<br>Data for data graphics<br>Tableau introduction | Lesson - Introduction<br>Lesson - Tableau Primer<br>#A1: 11/15                             |
| 2 - 11/15 | Design principles<br>Categorical, time series, and statistical data graphics         | Lesson - Design principles<br>#A2: 11/29                                                   |
|           | No class 11/22 - Thanksgiving                                                        |                                                                                            |
| 3 - 11/29 | Storytelling<br>Multivariate displays                                                | Lesson - Display types<br>Project pitch due: 11/29<br>#A3: 12/6                            |
| 4 - 12/6  | Geospatial displays                                                                  | Lesson - Geospatial displays<br>#A4: 12/13                                                 |
| 5 - 12/13 | Dashboards, interactive and animated displays                                        | Lesson - Interactivity                                                                     |
| 6 - 12/20 | Project presentations and class wrap up                                              | Lesson - The visual pitch<br>Final project due: 12/19<br>Final project presentation: 12/20 |

This project is a demonstration of your knowledge and fluency with data visualization techniques and tools. This project is an opportunity for you to create a series of data graphics based on data that you select. You will create at least 4 visualizations based on your defined audience, data, and tasks. You will present visualizations to the class in the form of a compelling story.

Many of you are taking this class because you want to learn how to create data visualizations for use throughout your career. In some cases, you may be working with a team of analysts and data scientists. In others instances, you'll be working alone. For this project, you will come up with a project proposal for a fairly large data visualization project. Then, as a proof of concept, you will individually create a small subset of the project. This will give you the opportunity to create a small data visualization project of at least 4 visualizations from start to finish. Finally, you'll deliver a brief 2-minute presentation of your larger project idea to the class and the smaller subproject of 4 visualizations. The subproject should illustrate a proof-of-concept for the larger project. Specifically, you'll be required to identify:

Who's the audience?

What's the data?

What's the task (objective, takeaway, key insight)?

## **Requirements**

- 1) Give your project a title. Propose larger project idea (with audience, data, and tasks)
- 2) Identify the audience, data, task for the subproject
- 3) Create 4 visualizations for your subproject
- 4) Create a slide that includes items 1, 2, and 3.
- 5) Deliver a compelling 2-minute presentation.

## Deadlines

|                                           |                  |
|-------------------------------------------|------------------|
| Project proposal and prototype            | 11/29 by 5:00pm  |
| Project review meeting with the professor | 11/29 - 12/19    |
| Project and presentation due              | 12/19 by 11:55pm |
| Project presentations                     | 12/20 by 6:00pm  |

## Deliverables

### 1. Project proposal

Produce a 1 page proposal (or longer) that defines the following:

- 1) Project scope
- 2) What do you know? What don't you know?
- 3) Data sources
- 4) Preliminary data graphics
- 5) Story-line
- 6) Project plan and timeline

Submission requirements: **Bring a print out** to class AND upload to NYU Classes > Assignments. > Project Proposal. Name the file: lastname\_firstname\_proposal

### 2. Meeting with the professor

You are encouraged to set up a brief meeting to discuss your project.

### 3. Final project

- Post your slides to the shared Google Presentation at:  
[http://bit.ly/datavis\\_project01](http://bit.ly/datavis_project01)
- Share your data and .twbx, Excel, and other source files in shared folder on GoogleDrive (ensure files in the folders are shared) with [ksosulsk@stern.nyu.edu](mailto:ksosulsk@stern.nyu.edu)

### 4. Project presentations

You will have 2-minutes to present your project followed by a critique.