

The Erdős Institute

Data Visualization Mini Course

Syllabus

Academic Aim

The aim of this mini course is to teach you how to produce data visualizations in a variety of programming languages/software while also touching on fundamental design principles. By the end of this mini course you will produce a portfolio worthy data visualization.

Brief Overview of Content

In alignment with the aim of the mini course our materials touch on the following content to varying degrees.

- Plotting in Python:
 - matplotlib,
 - seaborn,
 - plotly, and
 - bokeh.
- Web browser visualizations:
 - HTML,
 - CSS,
 - SVG, and
 - d3.js.
- Basic Tableau
- Basic design principles

Mini Course Format

Timeline

The mini course will take place over a six week period. Each two-week chunk will be dedicated to one of the three programming languages/software. At the end of the six week period participants will be given two weeks to complete and submit a portfolio worthy data visualization project (see section on final project below for more details).

Lectures

All lecture content will be available asynchronously through pre-recorded videos. Lectures will cover all technical content and some of the data visualization theory content. These videos can be found on the Erdős Institute website.

Problem Sets

Each of the six weeks will have a corresponding problem set that touches on the technical content covered that week. Problem sets will explore and expand upon good design principles. These are a good way to practice and learn leading up to your final project. Problem sets can be worked on in groups or on your own.

Final Project

In order to receive a certificate of completion you must submit a final project. Your final project should be a data visualization that you would be happy to show off in your data visualization portfolio. Projects can take a variety of forms including:

- An interactive dashboard,
- A data essay,
- A larger data visualization poster,
- A series of visualizations used as a part of your academic study,
- And more.

You may work by yourself or in small groups.

Other Mini Course Information

Prerequisites

The only coding prerequisite for this course is basic python competency. Any other programming language/software will be built up from scratch. It will be helpful to have an understanding of basic statistics and probability theory, but it is not required. Those looking to brush up on python should check out the Erdős Institute’s “Python Prep” materials from our main data science boot camp. Those looking to review statistics or probability should check out the slides at this link, <https://docs.google.com/presentation/d/1BPdJqdUrtxoBkbnP1iqzZtw0tPRkmRZdgcZm0oiTc9s/edit?usp=sharing>.

Computer Capabilities

You will need to be able to open and run a jupyter notebook on your computer in order to complete the python content. If you can ensure that you have the following packages installed that would be ideal:

- pandas,
- numpy,
- matplotlib,
- seaborn,
- plotly, and
- bokeh.

In order to complete the web browser visualization content you will need code editing software, visual studio is a good choice, <https://visualstudio.microsoft.com/>. You will also need a web browser on your computer. We suggest using one of Mozilla Firefox, Safari, or Google Chrome.

Access to the full Tableau suite requires a license. This license is free to current students. However, we will restrict ourselves to the free version of Tableau called Tableau Public, <https://public.tableau.com/app/discover>. You can access Tableau Public online or through a desktop app. Which one you use is up to you.

GitHub Repository

Educational materials for the mini course will be found at our GitHub repository, <https://github.com/TheErdosInstitute/data-viz>. This is a private repository so you will need to be granted access before you can actually see the repository. You can be granted access after you add your GitHub profile information to your Erdős Institute profile and contact our community manager.