**Summary**

Understanding why and how to present complex data interactively in an effective manner has become a crucial skill for any data scientist. In this course, you will learn how to design, judge, build and present your own interactive data visualizations.

**Content**

**Tentative course schedule**

**Week 1:** Introduction to Data visualization Web development  
**Week 2:** Javascript  
**Week 3:** More Javascript  
**Week 4:** Data driven documents (D3.js)  
**Week 5:** Interaction, filtering, aggregation (UI/UX), Advanced D3 / javascript libs  
**Week 6:** Perception, cognition, color Marks and channels  
**Week 7:** Designing visualizations (UI/UX) Project introduction Dos and don’ts for data-viz  
**Week 8:** Maps (theory) Maps (practice)  
**Week 9:** Text visualization  
**Week 10:** Graphs  
**Week 11:** Tabular data viz Music viz  
**Week 12:** Introduction to scientific visualisation  
**Week 13:** Storytelling with data / data journalism Creative coding  
**Week 14:** Wrap-Up

**Keywords**

Data viz, visualization, data science

**Learning Prerequisites**

**Required courses**

- CS-305 Software engineering (BA)  
- CS-250 Algorithms (BA)  
- CS-401 Applied data analysis (MA)  

**Recommended courses**

- EE-558 A Network Tour of Data Science (MA)  
- CS-486 Interaction design (MA)  
- CS-210 Functional programming (BA)
Important concepts to start the course
Being autonomous is a prerequisite, we don't offer office hours and we won't have enough teaching assistants (you've been warned!). Knowledge of one of the following programming language such as C++, Python, Scala. Familiarity with web-development (you already have a blog, host a website). Experience with HTML5, Javascript is a strong plus for the course.

Learning Outcomes
By the end of the course, the student must be able to:
• Judge visualization in a critical manner and suggest improvements.
• Design and implement visualizations from the idea to the final product according to human perception and cognition
• Know the common data-viz techniques for each data domain (multivariate data, networks, texts, cartography, etc) with their technical limitations
• Create interactive visualizations in the browser using HTML5 and Javascript

Transversal skills
• Communicate effectively, being understood, including across different languages and cultures.
• Negotiate effectively within the group.
• Resolve conflicts in ways that are productive for the task and the people concerned.

Teaching methods
Ex cathedra lectures, exercises, and group projects

Expected student activities
• Follow lectures
• Read lectures notes and textbooks
• Create an advanced data-viz in groups of 3.
• Answer questions assessing the evolution of the project.
• Create a 2min screencast presentation of the viz.
• Create a process book for the final data viz.

Assessment methods
• Data-viz (35%)
• Technical implementation (15%)
• Website, presentation, screencast (25%)
• Process book (25%)

Resources
Bibliography
Ressources en bibliothèque

- Data Visualisation / Kirk
- The Truthful Art / Cairo
- Interactive Data Visualization for the Web / Murray
- Visualization Analysis and Design / Munzner

Notes/Handbook
Lecture notes

Moodle Link

- https://go.epfl.ch/COM-480