**Summary**

This is a seminar course. By reading and discussing an introductory book as well as research papers about computational social science, students will become familiar with core issues and techniques in the field.

**Content**

Data collected through digital systems, such as online social networks, search engines, mobile phones, apps, etc., offer great opportunities for addressing important research questions about individual as well as collective human behavior. Whereas such issues had previously been studied primarily by social scientists, the sheer size of modern social data sets, as well as the fact that they are produced within computational systems, requires computational ways of thinking about, and processing, them. The goal of this seminar is to acquaint students with some of the fundamental questions and techniques arising in the context of computational social science.

We will explore the above topics simultaneously in two ways:

- We will read the book "Bit by Bit: Social Research in the Digital Age" by Matthew Salganik (available online for free).
- We will read research papers from computational social science that provide a deep dive into the topics discussed in the book.

Every week, we will focus on one book chapter and one accompanying paper (and sometimes additional complementary materials). All students will write a short summary and review of the respective paper, and one student will lead the in-class discussion, which will be about the paper as well as the book chapter etc. Beyond familiarizing themselves with research in the field, students will become better at assessing and critiquing scholarly work (by discussing and reviewing papers).

Through this course, students will obtain an overview of the research questions posed in computational social science, and of the tools and techniques available. Moreover, they will increase their ability to summarize and critique scientific papers.

As part of the class, enrolled students will write what we call synthesis proposals: students will choose one paper from computer science or a related field and will discuss in a short document (3 pages) how that paper could be improved or enriched with the computational social science techniques we have encountered in class. At the end of the semester, students will also present their synthesis proposals in short talks.

**Keywords**

Computational social science, social networks, text analysis, natural language processing, information dynamics, machine learning

**Learning Prerequisites**
Required courses
No formal prerequisites, but we expect students to have a basic understanding of statistics, probabilities, and machine learning.

Learning Outcomes
By the end of the course, the student must be able to:
• Critique scientific papers
• Present other scholar’s work
• Assess / Evaluate positive aspects of given scientific papers
• Identify negative aspects of given scientific papers
• Propose improvements based on the techniques encountered in the course

Resources
Bibliography
Previous editions: https://dlab.epfl.ch/teaching/
Introductory book read as part of the class: http://www.bitbybitbook.com/

Ressources en bibliothèque
• Bit by bit : social research in the digital age