MGT-618

Computational research methods for social sciences

Younge Kenneth

Cursus	Sem.	Type
Management of technology		Opt.

Language of teaching	English
Credits	4
Session	
Exam	During the semester
Workload	120h
Hours	**56**
Courses	56
Number of positions	

Frequency

Every year

Remark

Schedule: Nov 3, Nov 10, Nov 17, Nov 24, Dec 1, Dec 8, Dec 15 Wednesdays: 9:15 - 12:00

Summary

The objective of this course is to introduce doctoral students to computational methods for data-driven research in the social sciences.

Content

By working through hands-on examples, the course builds a foundation of practical skills needed by students for scientific programming in the social science domain. The course surveys a wide range of different methods and models, and aims to inspire students to learn more about at least one of those methods or models to support their research. As such, the course complements more theoretical courses in probability, statistics, econometrics, optimization, simulation, and machine learning.

Note

Download the complete syllabus from the "Teaching" section of the Chair for Technology and innovation Strategy: https://www.epfl.ch/labs/tis/teaching/

Keywords

Data Processing, Visualization, Cloud Computing, Data Analysis, Text Analysis, Simulation, Machine Learning.

Learning Prerequisites

Important concepts to start the course

1. **Statistics**:
This course requires a basic understanding of Generalized Linear Models such as Ordinary Least Squares (OLS), the Logit Model, and the Poisson Model. You need to have taken a graduate-level course in statistics, or otherwise have sufficient probability theory and optimization theory to understand OLS, MLE, and basic statistics.
2. **Python**:
This course requires you to program in Python. If you do not know how to program in Python, then you must take a self-directed, online course in Python before the start of this course.
For students new to programming, we recommend the JetBrains Academy track on Python (https://hi.hyperskill.org). This course takes about 34 hours to complete and will prepare an absolute beginner up to the level required for this course. The JetBrains course also presents the material in interactive, bite-sized exercises, and provides powerful tools to track the concepts you have studied

(https://hyperskill.org/knowledge-map), which are helpful for beginners.
For students with experience in programming, but who are new to Python, we recommend the Kaggle course: https://www.kaggle.com/learn/python. The course takes ~ 7 hours to complete.
For students already familiar with Python, we recommend you prepare with advanced training on â##Pandasâ## by taking the following Kaggle course: https://www.kaggle.com/learn/pandas.

Assessment methods

70% Assignments:
Students must complete seven take-home assignments, each worth 10% of the overall grade. Each assignment should take around five hours to complete and is due before the start of the next class. The final assignment is due one week after the final class.
30% Project:
Students should also complete an individual, self-directed semester project worth 30% of the overall grade. The self-directed project should take around 15 hours to complete and is due 6 weeks after the last class. Ideally, the project will complement other aspects of your doctoral research and use real data.