

COURSE OUTLINE

Course Code / Title : HS3008 Introduction to Computational Social Science

Pre-requisites : HS1001 & HS2002

No. of AUs. : 3

Contact Hours : 39

Course Aims

It's difficult to go two steps without hearing about the computational turn in work and science. What is all the sound and fury about? Is it actually useful? In this class, you will be introduced to the fundamentals of the computational social sciences and decide for yourself. The computational social sciences refers broadly to social scientific research that relies primarily on methods and techniques that originate from computer and data science. You will (a) learn to program in two widely used scripting languages, Python and R, (b) how to gather and access a diverse range of computational data, (c) how to clean and pre-process said data, (d) how to produce effective visualizations from the data, and (e) use state-of-the-art machine learning techniques to produce useful inferences and predictions to problems in the social sciences.

Intended Learning Outcomes (ILO)

By the end of this course, you should be able to:

1. Become self-sufficient and proficient programmers in Python and R.
2. Set-up and troubleshoot the typical data analysis pipeline, starting from data gathering, pre-processing, and feature creation.
3. Master the basics of data visualization, natural language processing, and machine inference and prediction.
4. Apply the principles and techniques of computational social sciences to novel problems and contexts

Course Content

Lecture	
1	Course Introduction
2	Basics of programming
3	Managing Data I
4	Managing Data II
5	Data Visualization
6	Machine Learning I
7	Machine Learning II
8	Machine learning III
9	Introduction to text analysis
10	Basic text analysis measures
11	Clustering and classification
12	Word embeddings and transformer models
13	Ethics

Course Assessment

Weekly coding notebooks	: 50%
Class Participation	: 10%
Article report and presentation	: 15%
Final Project	: 25%
Total	----- 100%