Computational Social Science for Political Research Training Course

Professional Development Training Course Outline

Category	Political Science and International Relations	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

In an era defined by a **digital revolution** and the proliferation of **big data**, the landscape of political science has been fundamentally transformed. Traditional methods alone are no longer sufficient to analyze complex, interconnected global and domestic phenomena. Computational Social Science for Political Research Training Course bridges the gap between classic social science inquiry and modern computational methods. We'll equip participants with the skills to harness massive datasets from **social media streams** to **government archives** to uncover patterns, test theories, and make data-driven predictions about political behavior, public policy, and global events. You'll learn how to apply cutting-edge techniques like **machine learning**, **network analysis**, and **natural language processing** to answer enduring questions in politics.

Computational Social Science for Political Research Training Course is designed to foster a new generation of researchers and analysts capable of tackling contemporary challenges such as **disinformation**, **political polarization**, and the impact of technology on society. We will move beyond theory to practical, hands-on application, using real-world **case studies** to illustrate the power of computational methods. By the end of this course, you will be proficient in using computational tools to conduct rigorous, impactful research, making you a vital asset in academia, government, non-profits, and the private sector. The emphasis is on building a robust **methodological toolkit** for the **data-intensive** future of political science.

Programme Curriculum

Computational Social Science for Political Research Training Course

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Course Duration

10 days

Course Objectives

1. Master foundational **computational thinking** and **data literacy**.
2. Develop proficiency in **Python programming** for political data analysis.
3. Apply **machine learning** algorithms to predict political outcomes.
4. Conduct **social network analysis** to map political influence and information diffusion.
5. Perform **natural language processing (NLP)** on political texts, speeches, and social media.
6. Execute **web scraping** and **API data collection** for political research.
7. Design and implement **digital experiments** to study political behavior.
8. Utilize **causal inference** techniques for rigorous policy evaluation.
9. Visualize complex political data to communicate insights effectively.
10. Understand the **ethical implications** of using **big data** in political research.
11. Build and simulate **agent-based models** to explore complex social dynamics.
12. Analyze **public opinion** and **sentiment analysis** at scale.
13. Integrate traditional political science theory with **data-driven methodologies**.

Target Audience

- Political Science Students and Academics.
- Policy Analysts and Consultants.
- Data Scientists and Analysts.
- Campaign and Advocacy Professionals.
- Journalists and Media Professionals.
- Government Employees.
- Market Researchers.
- Social Science Researchers.

Course Modules

1. Introduction to Computational Social Science

- Defining **Computational Social Science** and its intersection with political research.
- The **Data Revolution** in political science: new sources and challenges.
- Foundational concepts: from hypothesis testing to **exploratory data analysis**.
- Overview of the Python ecosystem for social science (libraries like pandas, NumPy).
- **Case Study**: Analyzing electoral outcomes using demographic and polling data.

2. Python for Social Scientists

- Python fundamentals: data types, control flow, and functions.
- Essential data structures: lists, dictionaries, and sets.
- Working with the **pandas** library for data manipulation and cleaning.
- Introduction to data visualization with **Matplotlib** and **Seaborn**.
- **Case Study**: Cleaning and exploring a dataset of legislative voting records.

3. Political Text as Data

- Introduction to **Natural Language Processing (NLP)**.
- Text cleaning and preprocessing: tokenization, stemming, and stop words.
- **Sentiment analysis** of political discourse.
- Topic modeling to uncover themes in political texts.
- **Case Study**: Analyzing sentiment on Twitter about a public policy debate.

4. Web Scraping for Political Data

- Ethical considerations and legal aspects of **web scraping**.
- Using **Beautiful Soup** to extract data from political websites.
- Collecting data from news archives and parliamentary records.
- Working with public APIs for social media and government data.
- **Case Study**: Scraping congressional speeches to analyze shifts in political language.

5. Social Network Analysis (SNA)

- Introduction to **network theory** and key metrics (centrality, density).
- Mapping political networks on social media.
- Identifying key influencers and communities.
- Analyzing the spread of political information and **disinformation**.
- **Case Study**: Mapping the network of political endorsements in an election campaign.

6. Introduction to Machine Learning

- Fundamentals of **supervised vs. unsupervised learning**.
- **Regression models** for predicting continuous outcomes (e.g., voter turnout).
- **Classification models** for predicting discrete outcomes (e.g., voting choice).
- Model evaluation and validation techniques.
- **Case Study**: Building a model to predict voter affiliation based on demographic data.

7. Advanced Machine Learning for Politics

- Applying **ensemble methods** (Random Forest, Gradient Boosting).
- Introduction to **neural networks** and deep learning.
- Clustering algorithms to segment voter populations.
- Techniques for dealing with imbalanced datasets in political science.

- **Case Study**: Using machine learning to identify swing voters in a political campaign.

8. Causal Inference and Experiments

- The challenge of **causality** in political research.
- Introduction to **randomized controlled trials (RCTs)** and quasi-experiments.
- Matching methods and propensity score analysis.
- Difference-in-differences and regression discontinuity designs.
- **Case Study**: Evaluating the causal effect of a get-out-the-vote campaign.

9. Agent-Based Modeling (ABM)

- Introduction to **ABM** for simulating political processes.
- Defining agents, their rules, and their environment.
- Simulating the spread of political rumors and social movements.
- Exploring political polarization and collective behavior.
- **Case Study**: Simulating the spread of political opinions in a polarized society.

10. Geographic Information Systems (GIS)

- Introduction to **geospatial data** for political analysis.
- Mapping election results and demographic patterns.
- Spatial analysis of social and political phenomena.
- Using GIS to study gerrymandering and voter access.
- **Case Study**: Mapping and analyzing voter turnout across different districts.

11. Analyzing Survey and Public Opinion Data

- Computational methods for analyzing large-scale survey data.
- Predicting public opinion using survey data and digital traces.
- Bias and representativeness in online data.
- Using machine learning for survey weighting and imputation.
- **Case Study**: Combining traditional survey data with social media sentiment to forecast election results.

12. Ethics and Governance in Computational Social Science

- Navigating the **ethical landscape** of big data.
- Privacy concerns and data de-anonymization.
- The role of **algorithms** in shaping political narratives.
- Ethical considerations in data collection and research design.
- **Case Study**: Debating the ethics of using social media data for political targeting.

13. Communicating with Data

- Principles of effective **data visualization**.
- Creating compelling static and interactive visualizations.
- Crafting a data story: from analysis to narrative.
- Best practices for presenting research findings.
- **Case Study**: Designing a compelling data-driven report on a political issue for a policy audience.

14. Advanced Topics and Current Trends

- The rise of **Large Language Models (LLMs)** and their application in political science.

- Introduction to **causal discovery** from observational data.
- Analyzing political behavior in virtual and augmented reality environments.
- The future of **computational political research**.
- **Case Study**: Using an LLM to analyze and summarize political debates.

15. Capstone Project

- Developing a research question and project proposal.
- Data acquisition and preparation.
- Application of multiple computational methods.
- Final project presentation and peer review.
- **Case Study**: Participants present their independent research projects, which can range from analyzing **misinformation diffusion** to modeling **protest dynamics**.

Training Methodology

- Interactive Lectures.
- Hands-on Labs.
- Case Studies.
- Project-Based Learning
- Peer Collaboration
- Guest Speakers

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

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