Network Analysis and Graph Theory in Social Science Research Training Course

Professional Development Training Course Outline

Category	Research and Data Analysis	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

In today’s data-driven world, social science research is rapidly evolving with the integration of network analysis and graph theory techniques to uncover relationships, influence patterns, and systemic structures in human behavior and societal dynamics. Network Analysis and Graph Theory in Social Science Research Training Course is designed to equip researchers, data analysts, policy makers, and academic professionals with cutting-edge methodologies to map, visualize, and analyze complex social networks using graph-theoretical concepts. Participants will explore the powerful intersection of quantitative analysis and sociological insights, enabling a deeper understanding of power dynamics, information flow, and community detection in various social contexts.

The course blends interactive learning with hands-on practical applications, using popular network analysis tools such as Gephi, UCINET, Pajek, and Python’s NetworkX. Whether examining communication in organizations, tracking social movements, or analyzing online behavior, this training empowers learners to harness graph-based modeling, uncover hidden structures, and generate data-driven insights for real-world challenges in political science, economics, public health, and beyond.

Programme Curriculum

Network Analysis and Graph Theory in Social Science Research Training Course

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Course Objectives

1. Understand the foundational concepts of network analysis and graph theory in social science.
2. Define and analyze nodes, edges, and graphs in various sociological contexts.
3. Apply centrality measures (degree, closeness, betweenness) for influence analysis.
4. Conduct community detection and clustering in social networks.
5. Utilize Gephi and NetworkX for visualizing and interpreting graph data.
6. Implement bipartite, multiplex, and dynamic networks for advanced modeling.
7. Apply social network analysis (SNA) to organizational and behavioral studies.
8. Integrate graph metrics into qualitative and quantitative mixed-method research.
9. Analyze real-time social data from social media networks and online communities.
10. Evaluate policy networks and stakeholder mapping using graph theory.
11. Enhance predictive modeling using network topology and graph analytics.
12. Interpret ethical and practical implications of network-based research.
13. Design and execute independent graph-theory-based research projects.

Target Audience

1. Social Science Researchers
2. Data Scientists and Analysts
3. University Lecturers and Academicians
4. Government Policy Planners
5. NGO and Advocacy Organization Staff
6. Graduate Students in Political Science, Sociology, or Economics
7. Public Health Researchers
8. Journalists and Media Analysts

Course Duration: 5 days

Course Modules

Module 1: Introduction to Network Analysis and Graph Theory

- Definitions and terminology in networks and graphs
- Relevance of networks in social science
- Types of networks: directed, undirected, weighted
- Basic graph visualization principles
- Overview of graph analysis tools
- **Case Study**: Mapping communication networks in a university department

Module 2: Network Structures and Properties

- Graph metrics: degree, path length, density
- Structural holes and network cohesion
- Connected components and bridges
- Role of weak ties in social networks

- Identifying influencers in a network
- **Case Study**: Analyzing friendship networks among high school students

Module 3: Centrality Measures and Their Interpretations

- Degree, closeness, betweenness, eigenvector centrality
- Measuring influence and power in networks
- Correlating centrality with social roles
- Ranking nodes by importance
- Centrality in directed vs undirected graphs
- **Case Study**: Identifying key decision-makers in a corporate hierarchy

Module 4: Community Detection and Network Clustering

- Introduction to modularity and clustering
- Popular algorithms: Girvan-Newman, Louvain method
- Detecting cohesive subgroups
- Visualization of clusters
- Understanding echo chambers in social systems
- **Case Study**: Discovering online echo chambers in Twitter political discussions

Module 5: Tools and Software for Network Analysis

- Introduction to Gephi and Pajek
- Visualizing networks with NetworkX in Python
- Importing and cleaning datasets
- Customizing graph layouts and attributes
- Interpreting results with dashboards and visuals
- **Case Study**: Visualizing a health communication network using Gephi

Module 6: Multimodal and Dynamic Network Modeling

- Modeling bipartite and multiplex networks
- Temporal networks and time-series analysis
- Visualization of evolving networks
- Dynamics of information and virus spreading
- Integrating qualitative data in dynamic networks
- **Case Study**: Tracking NGO collaborations over 5 years

Module 7: Applications in Public Policy and Social Impact

- Network approaches to policy evaluation
- Stakeholder analysis using graph theory
- Inter-agency collaboration analysis
- Using networks for impact assessment
- Policy diffusion through social networks
- **Case Study**: Stakeholder mapping in a rural development program

Module 8: Ethical, Practical, and Research Design Considerations

- Privacy and anonymity in network data
- IRB and consent in SNA research
- Handling missing or noisy data
- Integrating graphs in mixed-methods design
- Writing and publishing graph-based research
- **Case Study**: Designing an ethical SNA research project on youth peer influence

Training Methodology

- Instructor-led live sessions with real-time demonstrations
- Hands-on activities using Gephi, NetworkX, and UCINET
- Guided analysis of pre-collected social datasets
- Group discussions and peer-to-peer learning
- Application-based case study analysis per module
- Final capstone mini-project with instructor feedback

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	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

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