Advanced Regression for Social Scientists Training Course

Professional Development Training Course Outline

Category	Demography and Population Studies	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Advanced Regression for Social Scientists Training Course is designed to equip social science researchers, data analysts, and policy professionals with advanced statistical modeling techniques to extract meaningful insights from complex datasets. Leveraging cutting-edge regression techniques, this course focuses on enhancing predictive accuracy, model interpretation, and data-driven decision-making. Participants will explore multiple regression frameworks, logistic regression, hierarchical modeling, and time series regression while integrating contemporary tools such as R, Python, and specialized statistical software for applied research.

With the growing importance of quantitative research in social sciences, this course emphasizes practical applications across sociology, political science, economics, public health, and education. Case studies, real-world datasets, and simulation exercises ensure that participants can immediately apply regression techniques to their research, policy analysis, and program evaluation projects. The curriculum is optimized for professionals seeking to elevate their analytical skill set and generate actionable insights from large and complex datasets.

Programme Curriculum

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Course Objectives

By the end of this training, participants will be able to:

1. Develop advanced linear and non-linear regression models for social science research.
2. Apply logistic regression and multinomial regression to categorical outcomes.
3. Implement hierarchical and mixed-effects models for nested data structures.
4. Conduct time series and panel data regression analysis.
5. Evaluate model fit, diagnostic statistics, and multicollinearity.
6. Interpret regression outputs for actionable social policy insights.
7. Integrate Python and R for automated regression analysis workflows.
8. Handle missing data and outliers in regression datasets.
9. Apply cross-validation techniques to prevent model overfitting.
10. Design simulation studies to validate regression assumptions.
11. Implement interaction terms and polynomial regression models.
12. Communicate regression results effectively to non-technical audiences.
13. Critically evaluate published research using advanced regression techniques.

Organizational Benefits

- Enhanced data-driven decision-making across departments.
- Improved accuracy of social research and program evaluations.
- Increased capacity for predictive modeling and forecasting.
- Streamlined reporting of complex statistical results.
- Strengthened analytical skills for policy development.
- Better identification of key factors influencing social outcomes.
- Reduced errors in research interpretation and publication.
- Improved credibility and evidence-based organizational strategies.

- Development of internal expertise in regression modeling.
- Support for innovative social science research projects.

Target Audiences

1. Social science researchers
2. Data analysts in public and private sectors
3. Policy makers and program evaluators
4. Graduate students in social sciences
5. Academic faculty and research staff
6. Public health statisticians
7. Economists and political analysts
8. NGO and think-tank researchers

Course Duration: 10 days

Course Modules

Module 1: Foundations of Regression Analysis

- Overview of linear regression theory
- Assumptions of classical linear models
- Handling continuous and categorical variables
- Diagnostic techniques for model validation
- Introduction to statistical software for regression
- Case study: Regression assumptions in public health datasets

Module 2: Multiple Regression Analysis

- Developing multivariate regression models
- Identifying and interpreting regression coefficients
- Detecting multicollinearity and autocorrelation
- Model selection and variable reduction techniques
- Practical exercises using R and Python
- Case study: Predicting education outcomes with multiple predictors

Module 3: Logistic Regression

- Binary and multinomial logistic regression concepts

- Odds ratios and probability interpretation
- Model evaluation using ROC curves and confusion matrices
- Handling imbalanced datasets
- Application in survey and panel data
- Case study: Logistic regression for voter turnout analysis

Module 4: Hierarchical and Mixed-Effects Models

- Understanding nested and clustered data
- Random vs. fixed effects
- Estimation techniques for mixed models
- Applications in longitudinal studies
- Interpretation of hierarchical regression outputs
- Case study: Hierarchical modeling for community health interventions

Module 5: Time Series Regression

- Stationarity and autocorrelation in social data
- ARIMA and seasonal regression modeling
- Forecasting social trends
- Residual analysis and diagnostics
- Integrating external predictors
- Case study: Time series analysis of unemployment trends

Module 6: Panel Data Regression

- Fixed effects vs. random effects estimation
- Dynamic panel data modeling
- Handling unbalanced panels
- Model selection criteria
- Interpretation for policy analysis
- Case study: Panel regression in economic development research

Module 7: Interaction Effects and Polynomial Regression

- Modeling interaction terms in regression
- Polynomial regression for non-linear relationships

- Centering variables to reduce multicollinearity
- Graphical interpretation of interactions
- Application in behavioral research
- Case study: Interaction effects in survey responses

Module 8: Handling Missing Data and Outliers

- Methods for dealing with missing data
- Imputation techniques for social research
- Outlier detection and treatment
- Robust regression methods
- Impact on model accuracy and validity
- Case study: Missing data imputation in demographic surveys

Module 9: Cross-Validation and Model Selection

- k-fold cross-validation techniques
- Ridge, Lasso, and Elastic Net regression
- Bias-variance trade-off in social science models
- Model selection for predictive accuracy
- Practical exercises with real datasets
- Case study: Predictive modeling for social program evaluation

Module 10: Regression Diagnostics

- Residual analysis and leverage points
- Cook’s distance and influence measures
- Detecting heteroscedasticity
- Transformation of variables
- Graphical diagnostic methods
- Case study: Diagnostics in public opinion research

Module 11: Simulation Studies for Regression

- Designing simulation studies
- Testing regression assumptions with synthetic data
- Sensitivity analysis

- Replication and reproducibility
- Simulation-based inference techniques
- Case study: Simulated data for policy scenario testing

Module 12: Advanced Predictive Modeling

- Machine learning integration in regression
- Regularization and feature selection
- Predictive performance metrics
- Ensemble regression methods
- Application in forecasting social phenomena
- Case study: Predicting social mobility using advanced models

Module 13: Communicating Regression Results

- Visualizing regression outputs effectively
- Writing reports for non-technical audiences
- Data storytelling techniques
- Infographic and dashboard integration
- Ethical considerations in reporting
- Case study: Communicating regression results to stakeholders

Module 14: Critical Evaluation of Research

- Evaluating published regression studies
- Identifying methodological limitations
- Replicating results using original datasets
- Comparing alternative models
- Applying findings to organizational contexts
- Case study: Critique of regression methods in social policy research

Module 15: Capstone Project

- Integration of learned techniques
- Analysis of complex social datasets
- Presentation of regression findings
- Peer review and feedback sessions

- Final project report submission
- Case study: Comprehensive regression analysis of national survey data

Training Methodology

- Interactive lectures and presentations
- Hands-on workshops with R and Python
- Real-world case study analysis
- Group discussions and peer learning
- Practical exercises and simulations
- Capstone project for applied skills demonstration

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

Start Date	End Date	Location	Price
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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