Non-Parametric Statistics for Skewed Data 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 the era of big data and complex analytical frameworks, traditional parametric approaches often fall short when dealing with skewed, non-normal, or ordinal data. Non-Parametric Statistics for Skewed Data Training Course is designed to equip professionals and researchers with advanced analytical tools to interpret real-world data accurately without relying on assumptions of normality. This course focuses on robust statistical techniques, distribution-free methods, and rank-based inference, providing learners with practical insights into handling asymmetrical datasets, especially prevalent in health, finance, and social sciences.

Whether you're analyzing biomedical trial results, conducting market research, or developing machine learning models, non-parametric methods such as the Mann-Whitney U test, Kruskal-Wallis test, and Spearman’s rank correlation are indispensable. This training provides hands-on experience, in-depth case studies, and interactive applications to solidify concepts and foster data-driven decision-making.

Programme Curriculum

Non-Parametric Statistics for Skewed Data Training Course

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Course Objectives

1. Understand key concepts in non-parametric statistics and their applications in skewed data.
2. Differentiate between parametric and non-parametric methods in data analysis.
3. Apply the Mann-Whitney U test, Wilcoxon signed-rank test, and Kruskal-Wallis test effectively.
4. Use Spearman's rank correlation and Kendall's tau for non-linear relationships.
5. Explore resampling methods like bootstrapping for estimating confidence intervals.
6. Implement non-parametric regression techniques using real-world datasets.
7. Evaluate data distribution shapes using graphical tools and skewness metrics.
8. Utilize R and Python to perform non-parametric analysis efficiently.
9. Interpret non-parametric test results for evidence-based decision-making.
10. Analyze ordinal and ranked data without relying on distribution assumptions.
11. Detect and manage outliers and non-normality in data.
12. Apply non-parametric approaches in healthcare, economics, and education sectors.
13. Develop data storytelling skills using non-parametric visualizations.

Target Audience

1. Data Analysts and Statisticians
2. Healthcare Researchers and Epidemiologists
3. Academic and University Lecturers
4. Business Intelligence Professionals
5. Government and NGO Data Specialists
6. Financial and Risk Analysts
7. Data Science Students and Graduates
8. Research and Evaluation Officers

Course Duration: 5 days

Course Modules

Module 1: Introduction to Non-Parametric Statistics

- Overview of parametric vs. non-parametric methods
- Assumptions in statistical tests
- Types of data suitable for non-parametric techniques
- Benefits of using non-parametric tests
- Limitations and misconceptions
- **Case Study:** Comparing patient recovery times with skewed distribution

Module 2: Descriptive Analysis for Skewed Data

- Visual tools: histograms, boxplots, and skewness
- Quantifying skewness and kurtosis
- Identifying outliers in non-normal data
- Using median and IQR for central tendency
- Transformations vs. non-parametric choice
- **Case Study:** Skewed income data analysis in urban populations

Module 3: Hypothesis Testing – Rank-Based Tests

- Mann-Whitney U Test application and interpretation
- Wilcoxon signed-rank test for paired data
- Kruskal-Wallis test for multiple groups
- Assumptions and effect sizes in non-parametric tests
- Choosing between parametric and non-parametric approaches
- **Case Study:** Analyzing student test scores across districts

Module 4: Correlation and Association Tests

- Spearman's rank correlation coefficient
- Kendall's tau and when to use it
- Interpreting strength and direction
- Graphical interpretation using scatterplots
- Comparison with Pearson's correlation
- **Case Study:** Customer satisfaction vs. loyalty rating study

Module 5: Resampling and Bootstrapping

- Concept of bootstrapping for confidence intervals
- Generating bootstrap samples in R and Python
- Interpreting bootstrap distributions
- Limitations and considerations
- Comparison with classical inference
- **Case Study:** Estimating median housing prices with bootstrapping

Module 6: Non-Parametric Regression Methods

- Introduction to non-parametric regression
- Kernel smoothing and LOESS
- Use cases and visualization techniques
- Avoiding overfitting in smoothed data
- Comparing with linear regression
- **Case Study:** Predicting healthcare costs with non-parametric models

Module 7: Applications in Real-World Fields

- Public health and clinical data analysis
- Educational research and policy development
- Financial time-series and fraud detection
- Environmental studies and sensor data
- Ethical considerations in data interpretation
- **Case Study:** COVID-19 symptom severity ranking analysis

Module 8: Practical Tools and Reporting

- Non-parametric tests in R: code and outputs
- Using Python’s SciPy and statsmodels
- Building reproducible workflows
- Reporting standards for non-parametric tests
- Visual communication and data storytelling
- **Case Study:** Presenting non-parametric results in a research paper

Training Methodology

- Interactive lectures and demonstrations
- Hands-on lab sessions using R and Python

- Real-world dataset analysis
- Guided group exercises and discussions
- End-of-module case study presentations
- Assessment quizzes and feedback sessions

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
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000

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

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

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com