MERCURY

# Statistical Measurement and Data Analysis

19 – 23 July 2027
Barcelona (Spain)



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# Statistical Measurement and Data Analysis

**Ref:** 16245_1012237 **Date:** 19 – 23 July 2027 **Location:** Barcelona (Spain) **Fees:** 5600 Euro

## Introduction:

Understanding and applying statistical measurement and data analysis are essential for professionals in today's data-driven environment. This Statistical Measurement and Data Analysis course provides participants with the conceptual framework and practical tools required for robust statistical interpretation.

This Statistical Measurement and Data Analysis training emphasizes accuracy in data collection, interpretation, and representation, ensuring well-informed decision-making. Participants will gain a deep understanding of descriptive and inferential statistics, hypothesis testing, and regression analysis.

Through practical case studies and hands-on data analysis, learners will develop the skills to solve complex problems. This Statistical Measurement and Data Analysis program enhances the ability to visualize data effectively and draw meaningful conclusions, bridging the gap between theory and real-world applications across various industries, including finance, healthcare, research, and management.

## Targeted Groups:

This Statistical Measurement and Data Analysis training course targets professionals seeking specialized knowledge and skills:

- Data analysts in the corporate and public sectors.
- Research professionals in academic or scientific institutions.
- Project managers utilize data to inform their decisions.
- Engineers and quality assurance officers are analyzing performance.
- Financial analysts are conducting risk assessments.
- Marketing analysts interpret consumer behavior.
- Healthcare professionals are involved in clinical research.
- Public policy professionals use evidence-based methods.
- Graduate students in statistics, economics, or related fields.
- Professionals transitioning into data-centric roles.

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## Course Objectives:

Participants will achieve the following objectives by completing the Statistical Measurement and Data Analysis course:

- Understand core statistical terms, concepts, and procedures.
- Differentiate between types of data and scales of measurement.
- Apply sampling techniques and avoid sampling bias.
- Use descriptive statistics to accurately summarize data sets.
- Visualize data with appropriate charts and graphs.
- Interpret frequency distributions and probability models.
- Conduct hypothesis testing to support decision-making.
- Perform correlation and regression analyses.
- Utilize statistical software for real-time data analysis and interpretation.
- Evaluate data integrity and recognize limitations.
- Translate statistical output into actionable business insights.
- Apply learned techniques to practical case studies.
- Communicate statistical findings clearly to stakeholders.
- Improve analytical thinking and data literacy.
- Build confidence in interpreting statistical reports.
- Demonstrate measurable performance improvement through data.

## Targeted Competencies:

Participants will gain the following competencies during the Statistical Measurement and Data Analysis program:

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- Proficiency in statistical concepts and analytical techniques.
- Confidence in selecting suitable data collection methods.
- Skills in data cleaning and preprocessing.
- Ability to generate descriptive and inferential statistics.
- Competence in hypothesis formulation and testing.
- Knowledge of linear regression and correlation analysis.
- Experience in data visualization techniques.
- Fluency in using tools like Excel, SPSS, or R for analysis.
- Interpretation of outputs into meaningful conclusions.
- Practical ability to support organizational decisions with data.

## Course Content:

### Unit 1: Foundations of Statistical Measurement:

- Introduction to statistics and types of statistical analysis.
- Understanding variables and data types.
- Levels of measurement: nominal, ordinal, interval, ratio.
- Sampling methods: random, stratified, and cluster sampling.
- Concepts of population vs. sample in statistical design.
- Importance of accuracy and reliability in measurements.
- Recognizing sources of statistical error and bias.
- Designing data collection instruments and tools.
- Ethical considerations in data measurement and reporting.

### Unit 2: Descriptive Statistical Analysis:

- Central tendency: mean, median, and mode explained.
- Measures of dispersion: range, variance, and standard deviation.
- Interpreting Shape: Skewness and Kurtosis of Distributions.
- Constructing and interpreting frequency tables.
- Creating histograms, bar charts, pie charts, and line graphs.
- Data transformation techniques for normalization.
- Using boxplots for identifying outliers.
- Interquartile ranges and five-number summary.
- Introduction to descriptive statistics in Excel/SPSS.

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## Unit 3: Probability & Inferential Statistics:

- Basics of probability theory and key rules.
- Understanding probability distributions: normal, binomial, Poisson.
- The Central Limit Theorem and its application.
- Confidence intervals and margin of error.
- Hypothesis testing fundamentals and steps.
- Types of errors: Type I and Type II are explained.
- Z-tests, t-tests, chi-square, and ANOVA techniques.
- Interpreting p-values and statistical significance.
- Real-world applications of inferential analysis.

## Unit 4: Regression Analysis and Data Relationships:

- Introduction to correlation and causation concepts.
- Pearson vs. Spearman correlation coefficients.
- Scatter plots and interpreting trends.
- Simple linear regression model: structure and assumptions.
- Coefficient of determination $R^2$ interpretation.
- Multiple regression analysis: adding variables.
- Residual analysis and diagnostic checking.
- Logistic regression overview and usage.
- Using statistical software for regression modeling.

## Unit 5: Advanced Data Analysis and Visualization:

- Data cleaning and preparation: missing values and outliers.
- Exploratory Data Analysis EDA techniques.
- Creating dashboards using Excel and BI tools.
- Using pivot tables for a dynamic data summary.
- Applying statistical tests using R or Python.
- Time Series Analysis Basics for Trend Forecasting.
- Multivariate data analysis: PCA and factor analysis.
- Visual storytelling: making data speak.
- Presenting findings for strategic decision-making.

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## Final Insights & Key Takeaways:

This course equips professionals with the critical analytical tools necessary to thrive in data-intensive environments. Through practical application, learners develop the capacity to analyze, interpret, and present statistical data effectively. The skills acquired contribute to confident, evidence-based decision-making, enabling participants to extract valuable insights from data and enhance their professional impact.