

# Course Outline

## Introduction to Data Analysis Course DATALYTICS: 2 days Instructor Led

### About this course

Data analysis and analytics are evolving disciplines. We constantly hear about big data, prediction, AI, and modeling techniques.

However, advanced techniques rest on fundamentals which can be applied in many job roles. This class quickly equips you with that foundation. Whether you're charting your overall business intelligence strategy or performing analysis yourself, these basic tools and techniques rapidly inform effective decision-making. In this fast-paced introductory workshop, we'll examine the history of business intelligence, its relationship to data analysis, and why the two are needed to help businesses deliver a complete assembly of the 'data puzzle'. We'll also address hurdles teams face when dealing with data overload and suggests some possible solutions.

Amid an ongoing explosion of data, there's also a greater need to understand who is qualified to correctly analyze data. We will explore the qualifications of data analysts as well as the analytic tools available for those people to use associated with the position.

Please note: Exercises in this course are not compatible with Excel in a web browser. Please make sure you have a version of Excel locally downloaded on your computer or access to Excel via Microsoft 365.

*This course has been submitted, reviewed, and approved by the International Institute of Business Analysis (IIBA) to award CDUs for attendance.*

### Audience profile

Anyone involved in operations, project management, business analysis, or management who needs an introduction to data analysis, would benefit from this class. Please note: Exercises in this course are not compatible with Excel in a web browser. Please make sure you have a version of Excel locally downloaded on your computer or access to Excel via Microsoft 365.

Professionals who may benefit include:

- Business Analyst, Business Systems Analyst, Staff Analyst
- Those interested in CBAP®, CCBA®, or other business analysis certifications
- Systems, Operations Research, Marketing, and other Analysts
- Project Manager, Team Leads, Project Leads, Project Assistants, Project Coordinators
- Those interested in PMP®, CAPM®, or other project management certifications
- Program Managers, Portfolio Managers, Project Management Office (PMO) staff
- Data Modelers and Administrators, DBAs
- Technical & other Subject Matter Experts (SMEs)
- IT Staff, Manager, VPs
- Finance Staff, Manager
- Operations Analyst, Supervisor
- External and Internal Consultants

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- Risk Managers, Operations Risk Professionals
- Operations Managers, Line Managers, Operations Staff
- Process Improvement, Compliance, Audit, & other Governance Staff
- Thought Leaders, Transformation & Change Champions, Change Manager
- Executives, Directors, & other senior staff exploring cost reduction and process improvement options
- Executive and Administrative Assistants and Coordinators
- Job seekers and those who want to show dedication to data analysis and process improvement
- Leaders at all levels who wish to increase their Data Analysis capabilities

### At course completion

After completing this course, students will be able to:

- Measure business performance.
- Identify improvement opportunities for business processes.
- Describe the need for tracking and identifying the root causes of deviation or failure.
- Use the principles, properties, and application of Probability Theory.
- Discuss data distribution including central tendency, variance, normal distribution, and non-normal distributions.
- Draw conclusions about a data population using statistical inference.
- Forecast trends using simple linear regression analysis.
- Perform accurate analysis after learning about sample sizes and confidence intervals and limits, and how they influence the accuracy of your analysis.
- Explore different methods and easy algorithms for forecasting future results and to reduce current and future risk.

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### Part 1: Data and Information

1. Data in the Real World
2. Data vs. Information
3. The Many “Vs” of Data
4. Structured Data and Unstructured Data
5. Types of Data

### Part 2: Data Analysis Defined

1. Why do we analyze data?
2. Data Analysis Mindset
3. Data Analysis Steps
4. Data Analysis Defined
5. Descriptive Statistics vs Inferential Statistics

### Part 3: Types of Variables

1. Categorical vs Numerical
2. Nominal Variables

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3. Ordinal Variables
4. Interval Variables
5. Ratio Variables

### Part 4: Central Tendency of Data

1. (Arithmetic) Mean
2. Median
3. Mode

### Part 5: Basic Probability

1. Probability Uses In Business
2. Ways We Can Calculate Probability
3. Probability Terms
4. Calculating Probability
5. Calculating Probability from a Contingency Table
6. Conditional Probability
7. Frequency Distribution

### Part 6: Distributions, Variance, and Standard Deviation

1. Discrete Distributions
2. Continuous Distributions
3. Range
4. Quartiles
5. Variance
6. Standard Deviation
7. Population vs. Sample
8. Application of the Standard Deviation
  - Standard Deviation and the Normal Distribution
  - Sigma ( $\sigma$ ) Values (Standard Deviations)
9. Bimodal distribution
10. Skew and Summary
11. Other Distributions
  - Poisson Distribution
  - Exponential Distribution
  - Pareto Distribution (“80/20”)
  - Log Normal Distribution
12. Distributions in Excel

### Part 7: Fitting Data

1. Bivariate Data (Two Variables)
2. Covariance and Correlation
3. Simple Linear Regression

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4. Linear Regression
5. Fitting Functions
  - Linear Fit
  - Polynomial Fit
  - Power-Law Fit

### **Part 8: Predictive Analytics Overview**

1. Monte Carlo Method