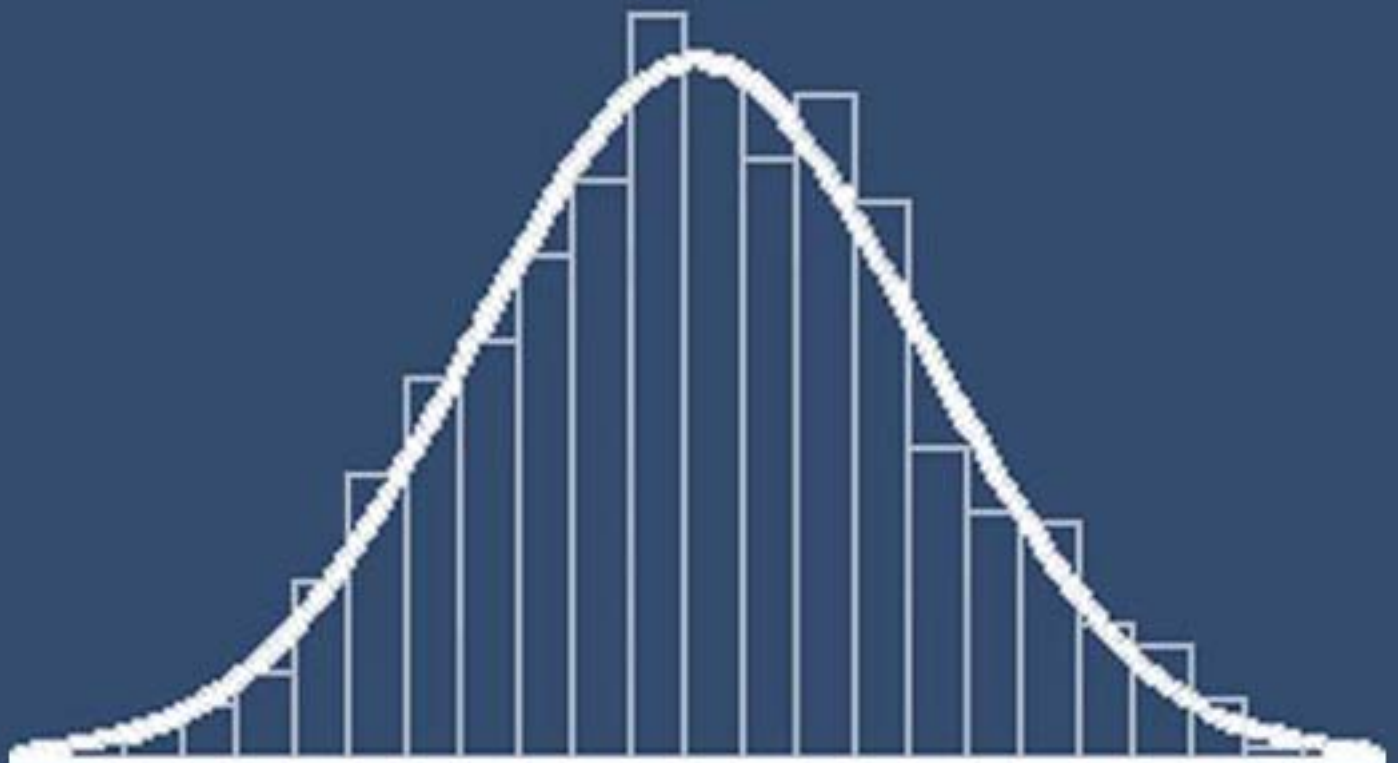




BASIC  
DATA ANALYSIS  
CURRICULUM



## Basic Data Analysis Curriculum

VR Data Systems offers our Basic Data Analysis Curriculum to any individual with no background in statistics and data analysis or for those who simply need a refresher. Our courses will provide an understanding of the basic concepts in statistics and probability, as well as the ability to quickly and easily interpret charts and graphs. Students will learn through practical applications, and are welcome and encouraged to use challenges from their own profession as learning tools during class discussions and projects.

All courses in our Basic Data Analysis Curriculum address one or more topics required for the following certifications by the American Society for Quality (ASQ):

- Certified Six Sigma Black Belt (CSSBB)
- Certified Quality Engineer (CQE)
- Certified Quality Manager (CQM)

### Courses

Code	Course Title	Length
BDC-100	Overview of Statistics	1 Day
BDC-105	Introduction to Statistics	2 Days
BDC-110	Introduction to Statistics and Probability	3 Days
BDC-115	Statistical Process Control	3 Days

### Customized Courses

VR Data Systems will customize any course(s) to suit the unique business requirements of our clients. From the modification of standard curriculum to new course development, we will provide the education and training your organization needs to be more productive in today's competitive environment. Ask a VR Data Systems representative for more information.

### About VR Data Systems, Inc.

VR Data Systems, Inc. (VRDS) is a training and consulting firm that specializes in Quality, Statistics, and Data Analysis. For more than 15 years, we have offered comprehensive, hands-on curricula for professionals at any experience level in numerous industries, including Pharmaceutical, Clinical, Manufacturing, Financial, and Software & Hardware Development. Our courses are taught by seasoned instructors who possess long-term expertise in their respective fields – from Sales and Marketing to Finance and R&D.

# Basic Data Analysis Curriculum

## BDC-100: Overview of Statistics

*Length: 1 day*

### Course Goal

Upon completion of this course, the student will understand basic statistical terminology as well as commonly used charts and graphs. In addition, the student will be able to interpret the results of previously analyzed data and be prepared to leverage this knowledge in various business applications. Just as important, participants will also be made aware of statistical misuse and misrepresentation.

### Course Description

This course provides an overview of the fundamental concepts of statistics. Topics include: measures of location and dispersion, organizing and analyzing qualitative and quantitative data, and basic ideas about normal distribution. Finally, the course provides an understanding of the organizational value of **Six Sigma**, its definition, philosophy and goals.

### Broad Topics

- Use and misuse of statistics
- Organizing and analyzing data
- Qualitative and quantitative data
- Measures of location and dispersion
- Histograms and bar charts
- Summary statistics and interpretation
- Normal distributions and applications
- Value of Six Sigma

### Target Audience

Any non-technical individual who would like to learn the most basic concepts and principles of statistics.

### Prerequisites

None.

“A knowledge of statistics is like a knowledge of foreign languages or of algebra; it may prove of use at any time under any circumstances.”

-- Arthur L. Bowley

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# Basic Data Analysis Curriculum

## BDC-105: Introduction to Statistics

**Length:** 2 days

### Course Goal

Upon completion of this course, the student will comprehend basic statistical terminology, as well as understand the critical differences between analyzing data using statistical values (summary statistics) and visualizing the data (graphical methods).

### Course Description

This course deals with the use of graphical and statistical tools to understand and interpret data. Students learn to identify, define, classify and compare continuous and discrete data, and recognize opportunities to define and apply nominal, ordinal, interval and ratio measurement scales. At the end of the course, relevant topics from the body of knowledge that make up ASQ's **Six Sigma Black Belt** Certification are discussed.

### Broad Topics

- Use and misuse of statistics
- Organizing and analyzing data
- Qualitative and quantitative data
- Measures of location and dispersion
- Histograms and bar charts
- Box plots
- Summary statistics and interpretation
- Frequency and cumulative frequency distributions
- Introduction to basic probability
- Normal distributions and applications (detailed review)
- Bernoulli/Binomial distributions
- Value of Six Sigma

### Target Audience

Any technical or non-technical individual who would like to learn the basic concepts and principles of statistics, including an in-depth look at the Normal Distribution and its applications.

### Prerequisites

None.

“A judicious man uses statistics, not to get knowledge, but to save himself from having ignorance foisted upon him.”

-- Thomas Carlyle

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## Basic Data Analysis Curriculum

### BDC-110: Introduction to Statistics and Probability

*Length: 3 days*

#### Course Goal

Upon completion of this course, the student will be able to utilize statistics to move beyond symbols, formulae and charts, arriving at solutions to business problems through the examination and interpretation of raw data.

#### Course Description

This course enables students to distinguish between enumerative (descriptive) and analytical (inferential) studies, and to distinguish between a population parameter and a sample statistic. Participants will learn how to apply concepts of probability such as independence, mutual exclusivity, multiplication rules and complementary probability. Different theoretical distributions will give students a solid background to apply these concepts to inferential statistics. At the end of the course, relevant topics from the body of knowledge that make up ASQ's **Six Sigma Black Belt** Certification are discussed.

#### Broad Topics

- Use and misuse of statistics
- Collecting and summarizing data
- Qualitative and quantitative data
- Measures of location and dispersion (variability of data)
- Frequency distributions
- Normal distribution and three Sigma limits
- Central Limit Theorem
- Population and sample
- Basic combinatorics
- Basic distributions: Binomial, Poisson, Normal, T/F and Chi-Squared
- Basic regression and correlation

#### Target Audience

Any technical or non-technical individual who would like to learn basic and intermediate concepts and principles of statistics and probability, including an in-depth look at several distributions.

#### Prerequisites

None.

“We provisionally define statistics as the study of how information should be employed to reflect on, and give guidance for action in, a practical situation involving uncertainty.”

-- V. Barnett

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## Basic Data Analysis Curriculum

### **BDC-115: Statistical Process Control (SPC)**

*Length: 3 days*

#### **Course Goal**

Upon completion of this course, the student will know how to measure, control, improve and monitor the processes within his or her organization. In addition, the student will understand how to leverage statistics and probability tools to maintain the stability and consistency of these improved processes.

#### **Course Description**

This course will help students to understand the objectives and benefits of SPC, including construction and interpretation of control charts, distinguishing between common and special causes, and process capability assessment. This course will deal with real-life business scenarios and incorporate the student's own processes and data, if available.

**This course is an absolute must for Six Sigma Black Belt Certification through the American Society for Quality (ASQ).**

#### **Broad Topics**

- Control charts for individuals, attributes and variables
- Seven tools for SPC
- Zone tests and analysis of patterns
- Process capability studies (design and conduct)
- Non-normal data transformations
- Continuous Improvement Process
- Application of SPC for Six Sigma

#### **Target Audience**

This course is for beginners and is highly recommended for individuals whose professions require evaluation, implementation and refinement of processes. The course focuses on assuring quality within an organization.

#### **Prerequisites**

BDC-105 (Introduction to Statistics), BDC-110 (Introduction to Statistics and Probability) or equivalent knowledge.

“When you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of the meager and unsatisfactory kind.”

-- Lord Kelvin  
(British physicist)

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