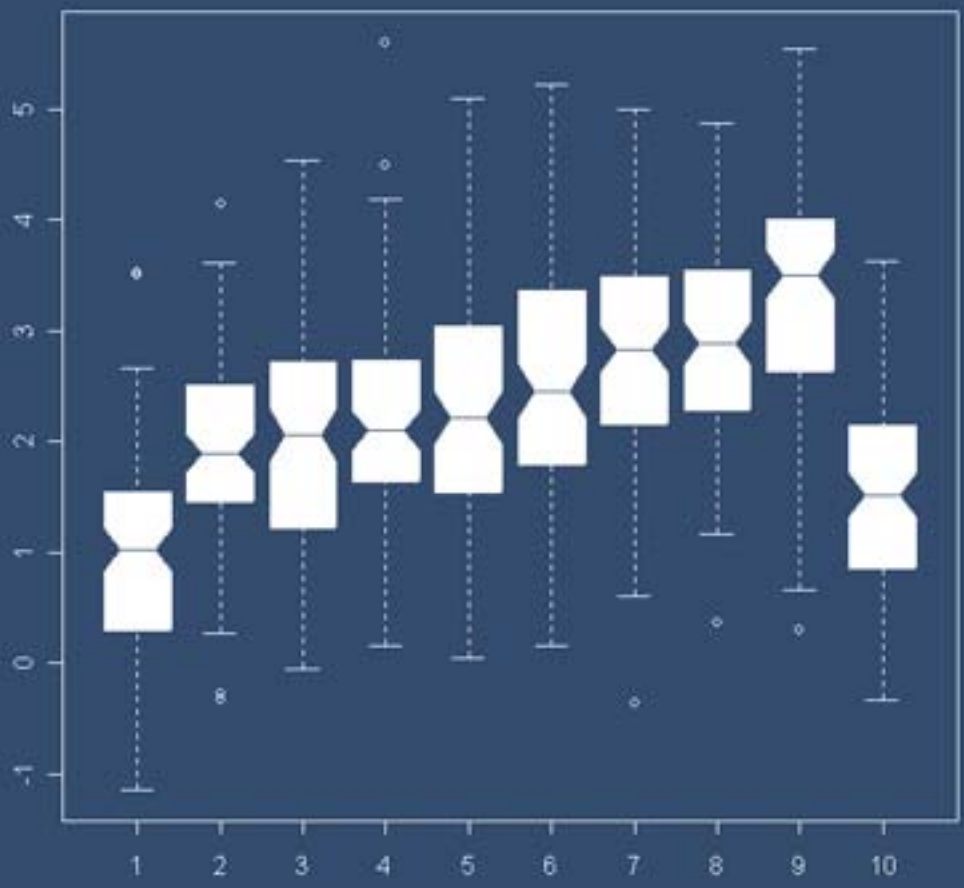


S-PLUS APPLICATIONS CURRICULUM



S-PLUS Applications Curriculum

VR Data Systems offers our S-PLUS Applications Curriculum to any individual seeking education and training in sophisticated statistical, data analysis and data modeling techniques using S-PLUS. Courses in this curriculum will provide an understanding of graphical data analysis, experimentation, hypothesis testing, and inference. Students will learn using practical applications, and are welcome and encouraged to use challenges from their own profession as learning tools during class discussions and projects.

S-PLUS software is the premier solution for exploratory data modeling and statistical analysis. With over 4,200 data analysis functions, including the most comprehensive set of robust and modern methods available anywhere, S-PLUS allows you to perform more insightful analyses, create revealing graphics and make more informed business decisions.*

VRDS has over 15 years of experience working with and teaching S-PLUS and its predecessor, S, which was originally developed in Bell Labs.

Courses

Code	Course Title	Length
SAC-450	Introduction to Statistics using S-PLUS	2 Days
SAC-455	Graphical Data Analysis using S-PLUS	2 Days
SAC-460	Statistical Process Control (SPC) using S-PLUS	3 Days
SAC-465	Statistical Inference using S-PLUS	3 Days
SAC-470	Design of Experiments (DOE) using S-PLUS	4 Days
SAC-475	Robust Design through Efficient Experimentation using S-PLUS	4 Days
SAC-480	Statistical Models using S-PLUS	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.

*from <http://www.insightful.com/products/splus/>

S-PLUS Applications Curriculum

SAC-450 Introduction to Statistics using S-PLUS

Length: 2 days

Course Goal

Upon completion of this course, the student will be able to understand fundamental statistical concepts and terminology, as well as know how to use S-PLUS to perform basic data analysis.

Course Description

This course is ideal for any student who has no prior knowledge of statistics or data analysis. Using S-PLUS, an integral part of this course, students will learn how to make sense of raw data, including patterns of dispersions, simple graphical analysis and relationships between two sets of data.

Broad Topics

- Using S-PLUS as a tool for data analysis
- Organizing and analyzing data using S-PLUS
- Qualitative and quantitative data
- Measures of location and dispersion
- Using S-PLUS to create and interpret basic charts
- Summary statistics
- Normal distributions and applications
- Simple linear regression

Target Audience

Any technical or non-technical individual who has no experience in statistics or data analysis and would like to learn how to analyze data using S-PLUS.

Prerequisites

None.

“What we have to learn to do, we learn by doing.”

-- Aristotle

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S-PLUS Applications Curriculum

SAC-455 Graphical Data Analysis using S-PLUS

Length: 2 days

Course Goal

Upon completion of this course, the student will understand how to analyze data graphically by using S-PLUS.

Course Description

Since the emphasis of this course is placed on how to look at data as graphics rather than summary statistics, students will learn that well-designed data graphics are usually the simplest and most powerful methodology to analyze, explore, describe, summarize and communicate different types statistical information.

Broad Topics

- Using S-PLUS as a tool for data analysis
- Elements of graphing data
- Portraying the distribution of a single set of data
- Comparing two sets of empirical distributions
- Comparing empirical data to theoretical distributions
- Studying two-dimensional data
- Developing and assessing regression models
- Plotting multivariate data

Target Audience

Any individual who would like to learn how to analyze patterns and/or trends within data using S-PLUS.

Prerequisites

None.

“[data analysis is] the process of simplifying data in order to make it comprehensible.”

-- Fraenkel and Wallen

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S-PLUS Applications Curriculum

SAC-460 Statistical Process Control (SPC) using S-PLUS

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 using S-PLUS.

Course Description

This course will help students 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-world business scenarios and incorporate the student's own processes and data, if available. During the course, the student will learn how to use S-PLUS to create charts and perform data analysis.

Broad Topics

- Using S-PLUS as a tool for data analysis
- 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

SAC-455 (Graphical Data Analysis using S-PLUS) or equivalent knowledge or either BDC-105 (Introduction to Statistics) or BDC-110 (Introduction to Statistics and Probability) with basic S-PLUS knowledge.

"The major difference between a thing that might go wrong and a thing that cannot possibly go wrong is that when a thing that cannot possibly go wrong goes wrong it usually turns out to be impossible to get at or repair."

-- Douglas Noel Adams

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S-PLUS Applications Curriculum

SAC-465 Statistical Inference using S-PLUS

Length: 3 days

Course Goal

Upon completion of this course, the student will understand how to generate samples and draw valid conclusions by applying rigorous statistical analysis methods to find and/or confirm research questions. These questions are then transformed into statistical hypotheses that can be tested using probability theory.

Course Description

In this course, students will learn the concepts of setting up several types of statistical tests to verify a hypothesis for population parameters based on sample statistics. Students will also be taught how to use S-PLUS to perform calculations. Group projects, based on the students' actual business requirements, will be used as tools to allow participants to combine all of the steps they have learned in order to set up experiments and draw conclusions from their data.

Broad Topics

- Using S-PLUS as a tool for data analysis
- Descriptive statistics
- Concepts in probability
- Discrete and continuous probability distributions
- Sampling distributions
- Confidence intervals
- Hypothesis testing
- Inferences on population mean, proportion and variance
- Linear regression

Target Audience

Any technical individual who would like to learn how to analyze patterns and/or trends within data.

Prerequisites

BDC-105 (Introduction to Statistics) or equivalent knowledge.

“Years ago a statistician might have claimed that statistics deals with the processing of data. . . today’s statistician will be more likely to say that statistics is concerned with decision making in the face of uncertainty.”

-- H. Chernoff and
L. E. Moses

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S-PLUS Applications Curriculum

SAC-470 Design of Experiments (DOE) using S-PLUS

Length: 4 days

Course Goal

Upon completion of this course, the student will be able to perform basic and advanced experimentation to understand the relationships between multiple sets of data using S-PLUS.

Course Description

This course teaches the concepts and terminology used in the field of experimental design and then covers the planning and execution of multi-factor experiments. The planning step enables students to make decisions regarding objectives, responses, factors and the plan to be used in the experiment. The execution step teaches students to allocate resources, collect data and analyze their results. The group projects, based on the students' actual business requirements, are useful tools that allow students to combine all of the steps they have learned in order to achieve a successful experiment protocol. Introduction to S-PLUS, as well as techniques for using S-PLUS to perform calculations for DOE, will be taught.

Broad Topics

- Introduction to experimentation
- Introduction to S-PLUS for Windows (part 1)
- Statistics of planned experimentation
- Introduction to factorial experiments: 2x2 model and 2x2x2 model
- Introduction to S-PLUS for Windows (part 2)
- Analysis of Two Setting Factorial Experiments
- Two-Level Fractional Factorial Experiments
- Analysis of Variance and Hypothesis Tests
- Factorial Experiments
- Iterative Experimentation
- Introduction to S-PLUS for Windows (part 3)

Target Audience

Any technical individual who would like to learn how multiple sets of data influence each other.

Prerequisites

BDC-110 (Introduction to Statistics and Probability) or equivalent knowledge. No prior knowledge of S-PLUS is required.

"If your result needs a statistician then you should design a better experiment."

--Baron Ernest
Rutherford

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S-PLUS Applications Curriculum

SAC-475: Robust Design through Efficient Experimentation using S-PLUS

Length: 4 days

Course Goal

Upon completion of this course, the student will be able to use statistical experimentation to plan experiments for obtaining dependable information about variables, including any noise factors, to make optimized R&D decisions using S-PLUS.

Course Description

In this course, students learn to apply Taguchi's robustness concepts and techniques such as signal-to-noise ratio, as well as control and noise factors. In doing so, participants will use the Fundamental Principle to improve the quality of a product by minimizing the effect of the causes of variation without eliminating the causes. Students also construct experiments and apply computational and graphical methods to analyze and evaluate the significance of results. Group projects will help them apply concepts to case studies. Introduction to S-PLUS, as well as techniques for using S-PLUS to perform calculations for course topics, will be taught.

Broad Topics

- Robust design method
- Introduction to S-PLUS for Windows (part 1)
- Robust design method and quality engineering
- Operational steps of robust design method
- Selecting response, control and noise parameters
- Introduction to S-PLUS for Windows (part 2)
- Signal-to-noise ratios
- Constructing control and noise arrays
- Predicting better control parameter settings
- Confirming improved robustness
- Robust design case study
- Introduction to S-PLUS for Windows (part 3)

Target Audience

Any technical individual who would like to learn how to make optimum decisions within development and manufacturing environments.

Prerequisites

BDC-110 (Introduction to Statistics and Probability) or equivalent knowledge. No prior knowledge of S-PLUS is required.

"To call in the statistician after the experiment is done may be no more than asking him to perform a postmortem examination: he may be able to say what the experiment died of."

-- R.A. Fisher

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R Applications Curriculum

SAC-480: Statistical Models using S-PLUS

Length: 3 days

Course Goal

Statistical models and simplified descriptions are central to studying natural or human phenomena. Upon completion of this course, the student will learn how statistical models can be applied to data sets that, in the past, were too large to analyze. Overall, the student will know the theory, methodology and diagnostics of using these models.

Course Description

This course introduces the concept of learning to use and apply state-of-the-art statistical models using S-PLUS. Different models as well as the built-in diagnostics are used to find the best model using different situations.

Broad Topics

- Introductions to Models in S-PLUS
- Linear Models and ANOVA
- Generalized Linear Models
- Generalized Additive Models
- Tree Based Models
- Nonlinear Models
- Mixed Effects Models
- Group project

Target Audience

This course is intended for statisticians or others that are proficient in statistics and want to quickly learn how to use and apply modeling techniques using S-PLUS.

Prerequisites

SCC-410 (Introduction to the S-PLUS Command Language) or equivalent knowledge and proficiency in statistics.

“Data is a lot like humans: It is born. Matures. Gets married to other data, divorced. Gets old. One thing that it doesn't do is die. It has to be killed.”

--Arthur Miller.

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