aicos

Training in Applied Statistics and Logistics

In classroom

Alternative: online

Training Overview

Title	PC	Days	Info
Visualization of Lab Data with Excel	yes	2 days	p. 4
Analysis of Lab Data with Excel	yes	2 days	p. 5
Method Validation in Analytics	yes	2 days	p. 6
Introduction to Biostatistics with Excel	yes	2 days	p. 6
Analysis of Repeated Measurements	yes	2 days	Web
Statistical Quality and Process Control	yes	1 day	p. 7
Advanced Use of Control Charts	yes	1 day	p. 7
Process Optimization and Control in the context of PAT	yes	2 days	p. 8
Process Optimization using Machine Learning in Practice	yes	2 days	p. 8
Analysis of Stability Data	yes	2 days	p. 9
Analysis of Life Cycle Data	yes	1 day	p. 9
Experimental Design and Analysis with STAVEX, Part A	yes	2 days	p. 10-11
Experimental Design and Analysis with STAVEX, Part B	yes	2 days	p. 10-11
STAVEX for Experts	yes	2 days	p. 10-11
Robust Design & Taguchi Method	yes	2 days	p. 12
Six Sigma Green Belt Training	yes	5 days	p. 13
Introduction to the Six Sigma Methodology	no	1 day	p. 13
Lean Six Sigma Green Belt Training	yes	5 days	p. 14
Introduction to the Lean Six Sigma Methodology	no	1 day	p. 14
Introduction to Data Mining	no	1 day	p. 15
Introduction to Multivariate Data Analysis	yes	1 day	p. 15
Neural Networks and Genetic Algorithms in Practice	no	1 day	p. 16
Analysis of Material Flows with Simulation, Part A	yes	2 days	p. 17
Analysis of Material Flows with Simulation, Part B	yes	2 days	p. 17

Dates: see registration form / website.

- All topics are illustrated by real-life examples and exercises.
- Mathematical formalism is avoided.
- The courses are available in English, French and German.
- The courses can take place in classroom as well as online.
- Company-specific courses (in-house or online) can be arranged for a department.
- Our instructors are professional statisticians with many years of experience in industry, especially in the chemical and pharmaceutical industry.

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For current dates and further information: www.aicos.com

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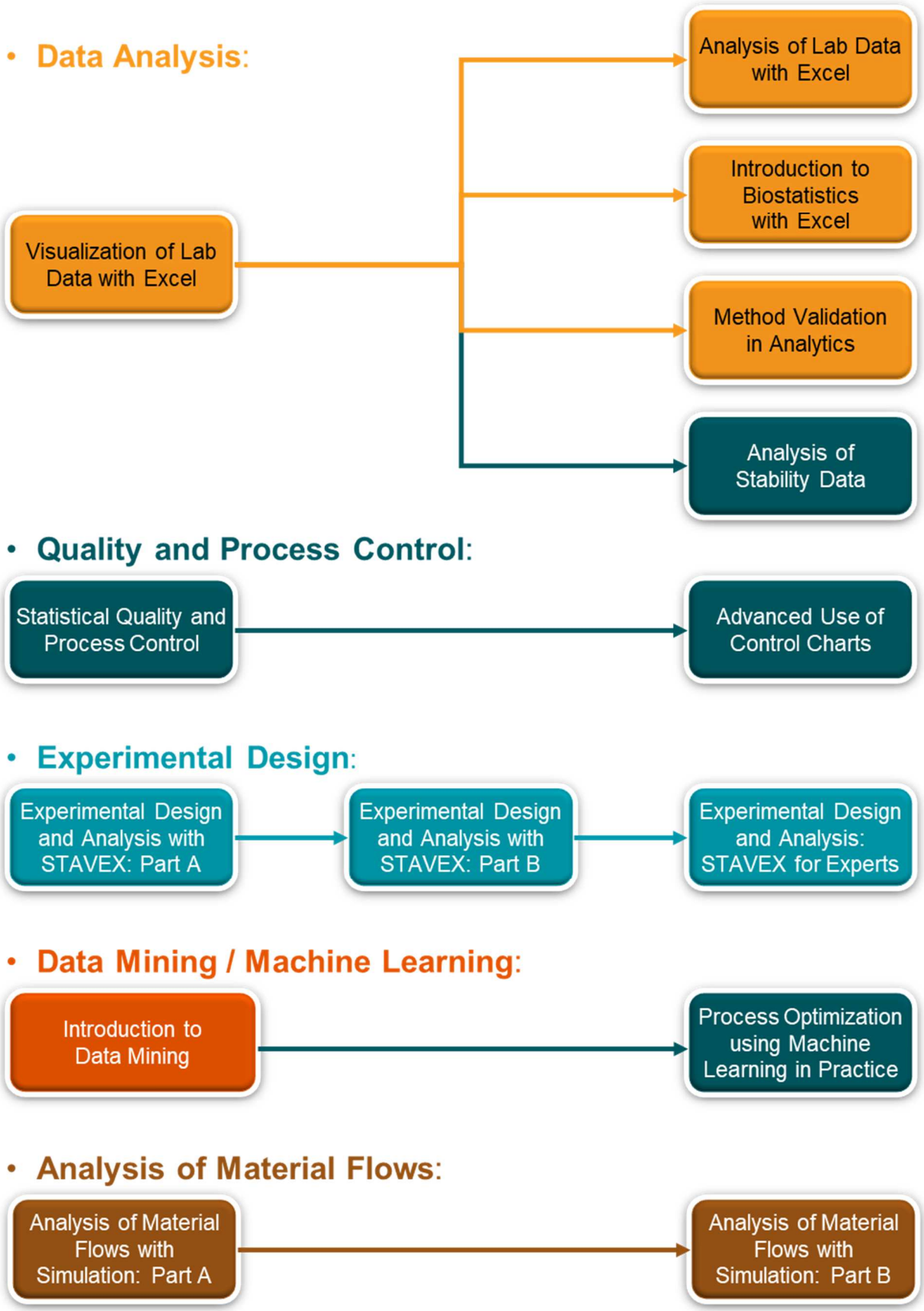
Recommended course sequences



Visualization of Lab Data with Excel

What are you going to learn?

You will learn how to identify and understand relationships within your data. The course gives an elementary introduction to the use of statistical methods. Simple but generally applicable data representation methods are shown, together with their correct application and interpretation. The focus is on graphical methods. Common basic statistical terms are explained. All methods are applied using Excel and Excel macros (EasyStat).

Who should attend?

- Lab technicians and supervisors, chemists, engineers
- Everyone working with Excel and wishing to analyse data
- Excel experience is an advantage but not essential
- No previous statistical or mathematical knowledge necessary

Which topics are covered?

Techniques for one variable	Stem and leaf diagram Histogram Mean, median Standard deviation, variance, range Box plot Statistical distributions, normal distribution Confidence interval (basic ideas) Quantile plot Simple control chart
Techniques for two variables	Scatterplot Correlation Linear regression (introduction)
Further recommendations	Pareto diagram Ishikawa diagram Stratification

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Analysis of Lab Data with Excel

What are you going to learn?

This 2-day course is aimed at those who need to interpret, evaluate and guarantee the quality of results obtained from their analytical laboratories. After the course, participants will be able to apply the relevant statistical tools using Excel. In particular, emphasis is on data visualization and modelling. Concepts and methods needed e.g. for validation purposes are addressed. The focus is on the practical application of these methods. Exercises based upon real-world examples constitute an important part of the course. The course uses Excel with supplementary macros (EasyStat).

Who should attend?

- Lab technicians and supervisors, chemists, engineers
- Elementary statistical knowledge is assumed (as provided in “Visualization of Lab Data”)
- Basic knowledge of Excel is essential

Which topics are covered?

Repetition of basic concepts	Simple graphical representation of results (box plot & histogram) Confidence interval for the mean Applications in validation (accuracy, trueness and precision) Outliers and outlier tests
Comparison of samples (series of measurements)	Graphical comparisons (parallel box plots) Statistical tests for the difference between 2 samples Analysis of variance for the comparison of several samples
Inter-laboratory experiments	Reproducibility of measurement methods Variance component analysis in the evaluation of inter-laboratory trials
Linear regression	Fitting a straight line Confidence intervals for slope and intercept Goodness of fit and residual analysis Transformations to achieve linearity Prediction Regression through the origin

Method Validation in Analytics

What are you going to learn?

With this course, participants will be able to master the different steps and calculations in analytical method validation. Also, they will know what to emphasize in a report. Besides the classical and still widely used approach of calculating r and R indices, we present as a modern alternative the so-called Accuracy Profile. This intuitive graphical method ideally combines all necessary information on the fitness for purpose. All methods are practiced on the PC using applied examples and exercises.

Who should attend?

- Technicians, supervisors, and chemists wishing to validate analytical methods in the lab
- Requirement: basic knowledge of Excel; no previous statistical knowledge necessary

Which topics are covered?

Basics	Fitness for purpose Limit of detection (LOD), limit of quantification (LOQ)
Validation processes	Linear regression, residual analysis Statistical indices (linearity, LOQ, matrix LOQ, repeatability, reproducibility, trueness, precision, ...): meaning, calculation Methods: recovery rate, spiking, Accuracy Profile, Horwitz ratio Practical tips (approach, randomization, quantification, reporting)

Introduction to Biostatistics with Excel

What are you going to learn?

This course focuses on the main statistical methods for biology, medicine, and pharmacy. Techniques for the comparison of two or more samples are presented, as well as repeated measurements, and some aspects of experimental design. All methods are explained clearly; mathematical formalism is avoided. A strong emphasis is on applied exercises using the PC. The course uses Excel with supplementary macros (EasyStat).

Who should attend?

- Scientists in research and development who need to analyse their data with statistical methods
- Excel and basic statistical knowledge is assumed (at least at the level of the course “Visualization of Lab Data”)

Which topics are covered?

Basics	Confidence interval for the mean Elements of statistical test theory Treatment of outliers, outlier tests
Comparison of two or more samples	Statistical tests: t-Test, Wilcoxon / Mann-Whitney-U Analysis of variance (ANOVA), multiple comparisons Repeated measurements (see also the specific course on our website) Sample size selection Analysis of 2x2 and nxm contingency tables (χ^2 test)

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Statistical Quality and Process Control

What are you going to learn?

When is a process under statistical control? How to detect quickly departures from the target value? How to measure process capability? In this course, you will learn the most commonly used statistical techniques relevant to the monitoring, improvement and validation of production processes. The methods are particularly important in development and production (GMP) for the early detection of quality deviations and for the documentation of process history (e. g. Annual Product Review). The emphasis is on the practical application of these methods, whereas mathematical formalism is avoided. Exercises constitute an important part of the course. All methods are explained on the basis of software demonstrations.

Who should attend?

- Mainly technicians involved in production and quality assurance
- Elementary statistical knowledge is necessary (as provided in “Visualization of Lab Data”)

Which topics are covered?

Statistical Quality Control (SQC)	Historical perspective Sampling plans: concepts (operating characteristics), examples (e.g. MIL STD 105E)
Statistical Process Control (SPC)	Shewhart control charts for group means and individual values Control limits and specifications CUSUM charts Process capability indices C_p and C_{pk}
Outlook	Multivariate process control Strategies for process validation (**Quality by Design**)

Advanced Use of Control Charts

What are you going to learn?

For control charts, usually a normal distribution of the data is assumed; in practice, this often is not the case. In this course, techniques for such data are shown (incl. the realization of the DIN ISO 21747 norm), as well as strategies for multivariate process control. Simple tests for process changes are presented (e.g. trend). All methods are trained on the PC.

Who should attend?

- Everyone who wishes to use control charts in complex situations

Which topics are covered?

Basics	Control charts, tests for process changes (e.g. trend)
Multivariate process control	Linear models Principal components analysis, Hotelling’s T^2 control chart
Not normally distributed data	Transformation, DIN ISO 21747 norm, P_p and P_{pk} indices Control charts for count data (p and u charts)

Process Optimization and Control in the context of PAT

What are you going to learn?

You want to organize your production according GMP standards, and therefore you want to understand and control your processes much better? PAT (Process Analytical Technology) is a systematic approach which is one of the central points in the “GMP initiative for the 21st century” of the FDA and is also strongly supported by the EMEA. In this course you will learn to design, analyse and supervise production processes systematically. All applications are illustrated using examples from practice, supplemented with software demonstrations and exercises on the PC.

Who should attend?

- Scientists, engineers and quality managers in development, production or QA
- Elementary statistical knowledge is assumed (as provided in “Visualization of Lab Data”)

Which topics are covered?

The PAT concept	The philosophy of PAT, strategies of process enhancement
Basics	Visualization of data, modelling the correlation structure between two observed variables using (multiple) linear regression
Statistical design of experiments (DoE)	Concepts and implementations in practice of statistical design of experiments, typical experimental designs and analysis methods
Statistical process control (SPC)	Quality control charts, Cusum charts Process capability indices C_p and C_{pk}
Multivariate analysis	Principal components analysis (PCA), Discriminant analysis Application: dimension reduction and multivariate process control

Process Optimization using Machine Learning in Practice

What are you going to learn?

This course provides a hands-on instruction how to get an overview of the process data, to choose suitable parameters for your analysis and to prepare the data. Subsequently, we introduce Machine Learning methods for a *root cause analysis* and process optimization. Here the main focus is on the intuitively understandable classification and regression trees (CART) which allow us to understand the impact of various parameters (temperature, duration…) on the behaviour of your process and thus to optimize it efficiently. All methods are illustrated by demonstrations using modern analysis tools and are practiced using applied exercises on the PC. After the training you will be able to perform similar analyses of your own data independently.

Who should attend?

- Everyone who wants to draw more information from available data

Which topics are covered?

Obtaining an overview, data preparation	Visualization methods (box plot, histogram, scatter plot, correlogram, density plots), outlier treatment, data reduction
Methods of Machine Learning	Linear models, Classification and Regression Trees (CART), result visualization and interpretation

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Analysis of Stability Data

What are you going to learn?

Are you in charge of assuring that your pharmaceutical, biotechnological, cosmetic, or food product remains stable during a certain period of time? In this course, you will learn the most common methods for the analysis of your stability data and the reliable estimation of its shelf life. The emphasis is on the use of graphical methods and on fitting appropriate statistical models. The methods will be explained using many applied examples and exercises that stem from the chemical, pharmaceutical and cosmetic industry; for this purpose, the software Excel is used and completed by validated macros (EasyStat). The requirements of the ICH guidelines will also be presented in detail.

Who should attend?

- Quality managers, chemists, pharmacists and engineers who are responsible for the stability or the quality of products during a fixed period of time
- Elementary statistical knowledge is assumed (as provided in “Visualization of Lab Data”).

Which topics are covered?

Basic concepts	Data situation Requirements of the ICH guidelines for the execution and evaluation of stability studies Statistical basics
Analysis of stability data (basic topics)	Linear regression: parameter estimation confidence regions Prediction of the stability Prediction of the shelf life
Analysis of stability data (advanced topics)	Covariance analysis Batch pooling Consideration of additional factors (e.g. packaging) Bracketing and matrixing Treatment of several responses

Analysis of Life Cycle Data

Have you tried to solve the problems mentioned above, but regarding the reliability of machines or your products?

In that case, this specific course is more suited for you. Find more information on www.aicos.com.

Experimental Design and Analysis with STAVEX

What are you going to learn?

Statistically designed experiments yield a maximum of information with a minimum of effort. The advantages of statistical design of experiments ("DoE") are:

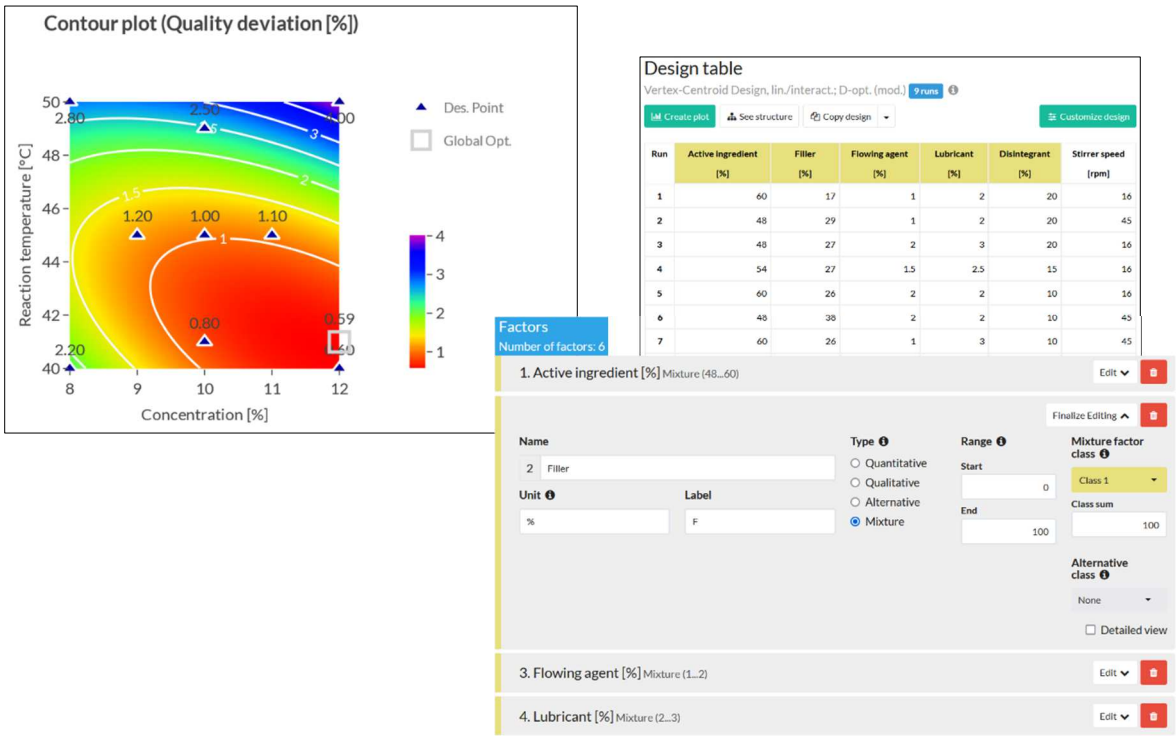
- Efficiency: only the necessary experiments are conducted!
- Accuracy: the maximum accuracy is achieved for the given experimental effort.
- Interactions: synergies between parameters are recognized and understood.

This course makes it possible for scientists to efficiently apply DoE for process or product optimization using STAVEX, providing both software practice and theoretical background.

STAVEX is a user-friendly web-based software (for the Intranet) that was originally developed by the Mathematical Applications Group in the former Ciba-Geigy company, one of the predecessor companies of Novartis. STAVEX is designed as an expert system which guides the user through the entire optimization process, i.e. from the initial design to the final data analysis, completely independently of a statistician, and thus makes the use of Design of Experiments very easy. Today, STAVEX is supported and extended by AICOS Technologies AG.

Who should attend?

- Scientists in chemistry, pharmacy, biotechnology, process technology, physics in research, development and production
- No previous statistical or mathematical knowledge necessary
- Part A of the course can also be attended by participants who do not plan to use STAVEX, but are interested in the backgrounds of statistical design of experiments
- Part B: Part A or corresponding knowledge is required. Previous experience using STAVEX is recommended but not required (incl. the discussion of own examples!)
- STAVEX for Experts: Part A and B or corresponding knowledge of the software functions required



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Which topics are covered?

Part A (2 days):

Concepts of statistical design of experiments (DoE)
Motivation:
- Why is statistical design superior to trial-and-error methods?

User inputs: response variables, factors, interactions
Strategy:
- ☞ Factor screening
- ☞ Modelling
- ☞ Optimization of a response variable

Experimental designs:
- ☞ Factorial designs
- ☞ Fractional factorial designs
- ☞ Designs for optimization

Methods of analysis:
- ☞ Screening: half normal plot
- ☞ Modelling and optimization: multiple regression

Sequential design of experiments

Part B (2 days):

Optimization of several response variables:
- ☞ Utility function
- ☞ Desirability function

Economic aspects
Special designs:
- ☞ Desperado designs
- ☞ D-optimal designs
- ☞ Designs for qualitative factors

Design adaption: restrictions, trend
Augmentation of a design or user-specified experiments
Handling of violated factor settings
Interactive visualization of designs and analysis results
Qualitative response variables:
- ☞ Specification and designs
- ☞ Analysis: discriminant analysis

Mixture factors:
- ☞ Concepts and specifications of restrictions
- ☞ Designs
- ☞ Analysis

Discussion of the participants' examples: **all participants have the possibility to analyse their own practical questions with the trainer.**
Recommendations for practice

STAVEX for Experts (2 days):

Introduction
Screening in spite of possibly important interactions?
Factor range changed: what now?
Representation of time courses:
- ☞ Optimization of time profiles
- ☞ Optimization of retention time

Representation of complex mixtures
Factor specification in spite of implicitly specified ranges
Hypothesis not confirmed: what to do?
Discussion of participant questions

Robust Design & Taguchi Method

What are you going to learn?

Do you want to develop your processes so that they are least sensitive to parameter variations but still close to a given target value? Do you want to achieve this at minimal cost and as quickly as possible? These ambitious and apparently contradictory objectives can be handled thanks to a simple but innovative application of experimental design techniques. The underlying methodology has been first developed in Japan by G. Taguchi. It nowadays constitutes one of the most significant parts of the modern process and product improvement methods. Successful applications have been reported in many industrial branches, such as chemistry, food, car or electronics. These methods can also be used in the pharmaceutical industry, for instance for the optimization of analytical measurement tools (HPLC) or for the tuning of complex devices.

Further to a refresher of the necessary concepts of experimental design and analysis, Taguchi's method will be thoroughly explained and discussed. The modern ideas of Robust Engineering will be treated. In the last part of the course, the participants will have the possibility to present and discuss their own problem settings.

Who should attend?

- Scientists, engineers and quality managers in development, production or quality assurance
- Elementary statistical knowledge is necessary (as provided in “Visualization of Lab Data”). Previous knowledge of experimental design techniques is not required but can be advantageous.

Which topics are covered?

Basics	Typical problems from industry Two perspectives: optimization of quantity vs. quality Optimization of quality according to Taguchi’s strategy (Robust Design) The basic ideas of experimental design and analysis
Statistics basics	Experimental design and analysis: strategy, effects and interactions, designs, model building, analysis Sequential approach Examples
Taguchi method	Taguchi’s philosophy and the robust parameter design problem Taguchi’s classical approach using product arrays Signal to noise ratio Taguchi’s experimental designs A critical view of Taguchi's method
Improvements of Taguchi’s method	Modern approach: combined treatment of design and disturbance parameters Analysis of interactions Uncontrollable noise parameters
Practical aspects	Discussion of the participants’ questions Recommendations for practice

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Introduction to the Six Sigma Methodology

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Six Sigma Green Belt Training

What are you going to learn?

It is your job to optimize existing processes, to improve quality and to minimize costs, and you want to use the renowned Six Sigma strategy for these tasks? You want to acquire the Green Belt knowledge by studying various cases from practice, in order to master the typical project workflow and the respective statistical analyses? This training first gives a 1-day introduction to the Six Sigma methodology and explains the 5 DMAIC steps (Define - Measure - Analyse - Improve - Control). Then you will get to know the Six Sigma tools and learn how to efficiently use them. You will directly apply your newly gained knowledge by solving problems from practice, working with Excel and a user-friendly Six Sigma software tool. The training fee covers the final examination, the certificate and a one-year license of the aforementioned tool.

Who should attend?

- **Introduction:** Managers who want to gain knowledge about the applicability of Six Sigma, persons responsible for production, quality assurance or for the introduction of Six Sigma to the company
- **Green Belt Training:** engineers, scientists and technicians from development, process technology, production or quality
- No previous statistical knowledge necessary, basic knowledge of Excel is an advantage

Which topics are covered?

Six Sigma Methodology (1 day)	What is Six Sigma? Reach the goal in 5 steps (DMAIC) Overview of adequate Six Sigma tools Implementation in a company, project management Presentation of successful Six Sigma projects
Six Sigma Tools (3.5 days)	Process Flow diagram, Ishikawa diagram Data visualization Basic concepts (statistical measures, process capability…) Statistical tests: comparisons of groups Linear regression (quantification of relationships) Introduction to the statistical design of experiments (DoE) Statistical quality and process control Numerous exercises on the PC
Closing (0.5 day)	Exam (certificate “Six Sigma Green Belt AICOS Technologies”)

Introduction to the Lean Six Sigma Methodology

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Lean Six Sigma Green Belt Training

What are you going to learn?

It is your job to optimize existing processes and to minimize costs, and at the same time you wish to improve quality, to reduce waste and to increase efficiency. For this purpose, you want to make a joint use of the renowned Six Sigma strategy and of the principles of Lean Management? You want to acquire the Green Belt knowledge by studying various cases from practice, in order to master the typical project workflow and the respective statistical and efficiency analyses? This training first gives a 1-day introduction to the Lean Six Sigma methodology and explains the 5 DMAIC steps (Define - Measure - Analyse - Improve - Control). Then you will get to know the Lean Six Sigma tools and learn how to efficiently use them. You will directly apply your newly gained knowledge by solving problems from practice, working with Excel and a user-friendly Lean Six Sigma software tool. The training fee covers the final examination, the certificate and a one-year license of the aforementioned tool.

Who should attend?

- **Introduction:** Managers who want to gain knowledge about the applicability of Lean Six Sigma, persons responsible for production, quality assurance or for the introduction of Lean Six Sigma to the company
- **Green Belt Training:** engineers, scientists and technicians from development, process technology, production or quality
- No previous knowledge of statistics or flow organization necessary, basic knowledge of Excel is an advantage

Which topics are covered?

Lean Management and Six Sigma Methodology (1 day)	What is Lean Six Sigma? Reach the goal in 5 steps (DMAIC) Overview of adequate Lean Six Sigma tools Implementation in a company, project management Presentation of successful Six Sigma projects
Lean Six Sigma Tools (3.5 days)	Process Flow diagram, Value Stream Mapping Ishikawa diagram, 8 Wastes check sheet Data visualization Basic concepts (statistical and Lean measures, process capability…) Statistical tests: comparisons of groups Linear regression (quantification of relationships) Introduction to the statistical design of experiments (DoE) Lean tools for process analysis and improvement Statistical quality and process control Numerous exercises on the PC
Closing (0.5 day)	Exam (certificate “Lean Six Sigma Green Belt AICOS Technologies”)

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Introduction to Data Mining

What are you going to learn?

Do you think that valuable information might be hidden in your data base? The term “Data Mining” subsumes those methods and algorithms that will help you to discover structures and relationships in (typically very large and complex) data sets. The course provides an overview of the most important methods in data mining. Aspects of data organization are discussed and selected statistical techniques are explained with applied examples.

Who should attend?

- Managers and scientists. No previous knowledge in statistics required.

Which topics are covered?

Introduction	What is data mining? Data mining vs. statistical data analysis
Data organization and data access	Obtaining data, data sources, data quality Data warehouse On-line analytical processing (OLAP)
Selected statistical techniques (overview)	Classification, clustering Modelling, CART trees Neural networks, genetic algorithms Limitations of data mining

Introduction to Multivariate Data Analysis

What are you going to learn?

Do you want to find and investigate more deeply the relationships between various quantities? You will get to know the central methods of multivariate statistics and you will learn how to identify the most important and most interesting structures in your data. These methods allow for a quick and clear interpretation of relationships. The methods and their application will be discussed using applied examples from the chemical and pharmaceutical industries (dyestuff production, process quality, spectrography), complemented by software demonstrations on the PC.

Who should attend?

- Everyone who wants to analyse (larger) multivariate data sets. Elementary knowledge of statistics is assumed (as provided in “Visualization of Lab Data”)

Which topics are covered?

Graphical displays	Scatterplot matrices, trellis display Interactive computer graphics (spin, brush)
Dimension reduction	Principal components analysis (PCA), biplot
Discrimination and classification	Discriminant analysis, classification and regression trees (CART), cluster analysis

Neural Networks and Genetic Algorithms in Practice

What are you going to learn?

Do you own large and complex data sets, containing valuable hidden information? Do you want to obtain reliable predictions based on historical data? Or do you have to identify optimal settings for certain input parameters of a system? Neural networks and genetic algorithms could be the solution. Neural networks have the capability of “learning” complex relationships between given data, even in the case where classical statistical methods reach their limits. In this course, the basic ideas of neural networks - which have found various applications (e. g. in chemical industry, robotics, forecasting of share courses and exchange rates, pattern recognition, medicine, etc.) will be discussed. In addition, genetic algorithms are presented, which are a very robust all-purpose optimization method. Genetic algorithms are applied to the learning process of neural networks and for the optimization of input parameters. The methods and their application are explained using practical examples; there will be software demonstrations on the PC.

Who should attend?

- Managers and scientists
- A minimal knowledge of mathematics is recommended but not necessary

Which topics are covered?

Neural Networks	History Feed-forward networks Learning process with data (back propagation) Advantages and disadvantages of neural networks Case study
Genetic Algorithms	Biological motivation Basic terms: fitness, selection, recombination, mutation Advantages and disadvantages Application examples
Software	Comparison of software solutions from different vendors for neural networks Demonstration with Excel

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Analysis of Material Flows with Simulation

What are you going to learn?

Is it your task to optimize an existing production plant with regard to its efficiency or utilization, or, as an engineer, to design a new plant optimally? In this course, you will learn how to identify existing bottlenecks and to perform capacity analyses by using logistical simulation, in order to reduce production costs and to avoid inappropriate investments.

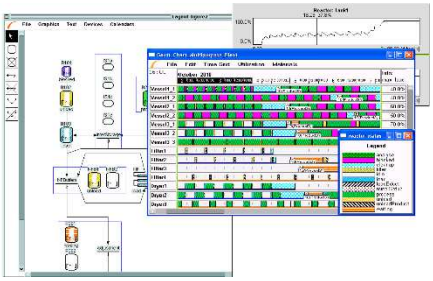
SIMBAX is a user-friendly PC software package that was originally developed within the former Ciba-Geigy company, one of the predecessor companies of Novartis. Today, it is maintained and extended by AICOS Technologies. SIMBAX is tailored to the needs of the process industries. It thus enables the engineer to model easily a variety of operations - from continuous processes to batch production, and even container logistics. Animated diagrams visualize the material flow; informative statistics facilitate the analyses of the results.

The course (2 modules of two days) provides the basic knowledge of material flow simulation and explains the functions of SIMBAX with practical examples and exercises.

Who should attend?

- Process developers who want to benefit from the optimization possibilities that exist at the logistic level (debottlenecking)
- Production managers who want to fully use the potential of existing plants by systematically eliminating conflicts between production flows
- Managers who want to learn about the various applications of material flow simulation

Which topics are covered?



Part A (2 days):

Introduction
- Various design and planning levels
- Components of a simulation model
- SIMBAX and its environment

Simulation of a single process
- Description and modelling of a plant and a recipe
- A first simulation run: analysis of the simulation results

Simulation of a multipurpose plant
- Representation of products and raw materials
- Description and modelling of a production plan

Overview of the SIMBAX functions
- Detailed description of a process stage
- Overview of the available steps (e.g. parallel, alternative and conditional steps)
- Comprehensive exercise

Part B (2 days):

Semi-continuous processes; separation and recycling using tanks
Quick modelling of similar recipes using parametric representations; watching of user-defined variables
Detailed graphical analysis of the Gantt chart in multipurpose plants
Container traffic: filling, emptying, transport
Synchronization of several process stages
Batch combination within a process
Limited availability of devices and resources (vacation, breakdown of equipment)
Recipe and product data management using Excel

The Trainers

Dr. Philippe Solot is CEO of AICOS Technologies. He looks back at more than 30 years of industrial experience. His specialization is mathematical optimization, in particular its application in improving development and production processes. He regularly coaches practical trainings for industrial companies and also gives lectures at Swiss and French universities. He is the author of approximately 20 scientific publications in journals such as the *International Journal of Production Research* and *INFOR*.

Dr. Solot holds a PhD from the EPFL (ETH Lausanne, Switzerland). For his doctoral thesis he was awarded the Robert Faure Prize in France by the French AFCET. From 2001 to 2005 he was president of the Swiss Operations Research Society.

Dr. Stefanie Feiler is senior consultant in applied statistics at AICOS Technologies and has 20 years experience in various statistical areas. She has executed many data analysis projects involving production or research data from several industrial sectors, mainly from the chemical and pharmaceutical industry. In trainings, her main concern is on the applications of the methods in the participants' typical working situations.

Dr. Feiler studied mathematics and chemistry at the university of Tübingen, Germany. During her exchange year in Besançon, France, she received a master's degree in pure mathematics. She obtained her PhD degree as member of the Statistics Group of the Institute for Applied Mathematics at the University of Heidelberg, Germany.

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Quotes from course participants

Read some spontaneous comments taken from our anonymous course evaluation forms:

"Very well structured course"

"Good simplified demonstrations of complex situations"

"Possibility to directly apply the new skills in exercises"

"The great number of questions that can be solved with the help of STAVEX"

"A good balance of practice and theory"

"Very professional, EasyStat was a pleasant surprise!"

"I liked the practical exercises on the PC very much."

"The trainer was excellent and highly competent. He explained complicated situations simply and clearly."

"Very good course material"

"My expectations have been exceeded: statistics often is boring. Good mix of theory and exercises."

We are happy to arrange courses tailored to your specific needs!

AICOS Technologies AG has already conducted special training sessions for the following companies:

- Actelion Pharrmaceuticals
- BASF
- B. Braun Medical
- Clariant
- CSL Behring
- Daiichi-Sankyo Europe
- Ems-Chemie
- F. Hoffmann-La Roche
- Gelita
- Huntsman Advanced Materials
- Ivoclar Vivadent
- Klosterfrau
- Merck
- Mettler-Toledo
- Novartis Pharma
- Reishauer
- SGL Carbon
- Siegfried
- Syngenta Crop Protection
- Torrent Pharmaceuticals
- Xellia
- ... and many more

Your Partner for Quality Engineering, Data Analysis, and Production Logistics

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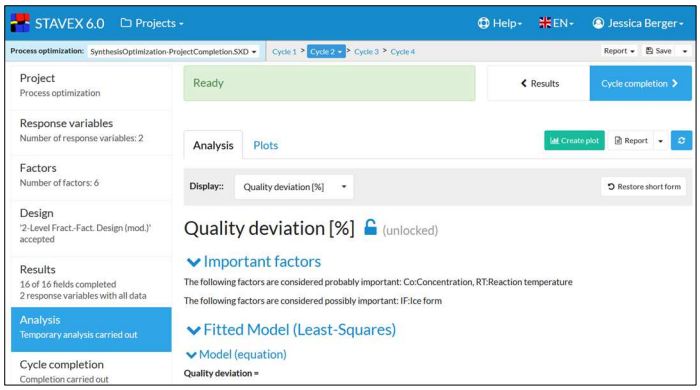
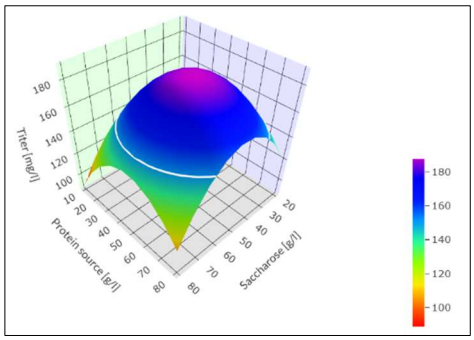
- **Consulting** or project execution
- **Software solutions** for your routine analyses with Excel, R, S-Plus, SAS

Software:

• STAVEX:

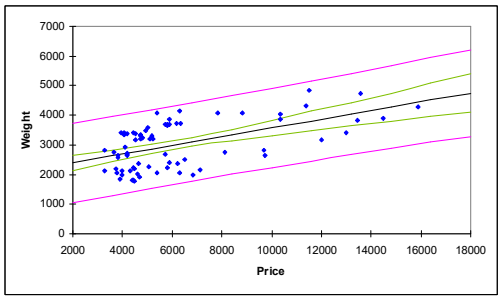
Our web-based expert system
for statistical design of experiments (DoE)





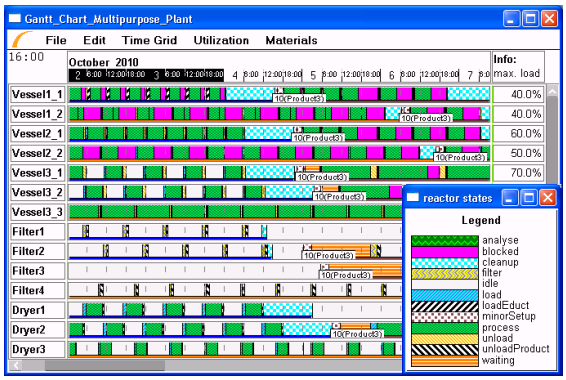
• EasyStat:

Our popular validated Excel macros
for easy data visualization and analysis



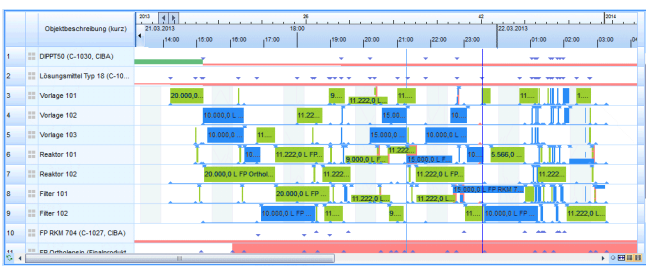
• SIMBAX:

Our tool
for material flow simulation



• Schedule++:

Our solution for easy production scheduling



Any questions?

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