

InnoVenton

Nelson Mandela University Institute for Chemical Technology and Downstream Chemicals Technology Station

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Dear Sir / Madam,

InnoVenton Short Learning Programmes 2019

In its quest to meet the training needs of industry, InnoVenton, at the Nelson Mandela University, Port Elizabeth, provides purpose-designed training in the areas of technology and skills training. Courses may be devised for individuals or groups and invariably consist of both a theoretical and a practical component.

Short courses can be tailor-made for companies to satisfy their individual training needs. In-house training could also be possible.

Should you wish to discuss your specific training needs, or should you have any questions about our short courses, please do not hesitate to contact me.

Kind regards,

Louise Hamilton

InnoVenton Short Courses: 2019

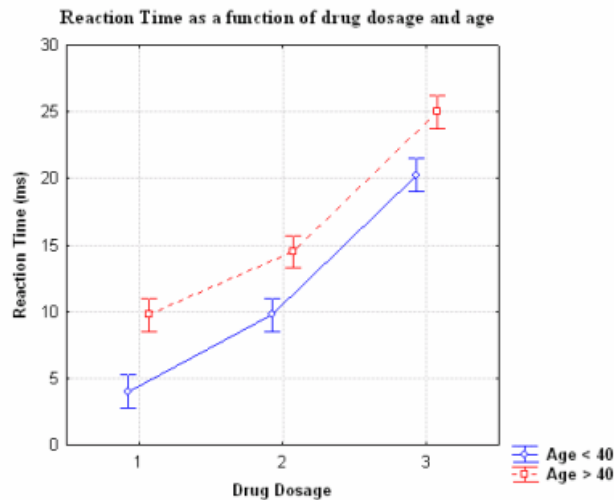
Short Course Name	Dates*	Duration	Fee per Person
Applied Biostatistics with Excel	This course can be presented at InnoVenton, Nelson Mandela University, or in-house.	3 days	R5500 (the fee for registered full time students is R3500)
Basic Chemical Engineering for Operators in the Chemical Process Industry	This short course can be presented on site.		
Basic Chemistry for Operators in the Precious Metal Industry	This short course can be presented on site.		
Data Analysis with Excel for Analysts, Scientists and Engineers	This course can be presented at InnoVenton, Nelson Mandela University, or in-house.	3 days	R5500 (the fee for registered full time students is R3500)
Quality Control with Excel for Process Operators, Analysts and Engineers	This course can be presented at InnoVenton, Nelson Mandela University, or in-house.	2 days	R3700
Sampling for Chemical Process Operators	This short course can be presented on site.		

* Please contact the short course coordinator to discuss the dates; the option of presenting the course on site / in-house; and to request a quotation.

- The fee includes course material and light refreshments.
- V.A.T. is not applicable.
- An official Nelson Mandela University short course certificate is presented when the student has obtained a pass mark of 50% or higher.
- Information regarding the above listed short courses may be found on the following pages.
- Short course coordinator: Mrs Louise Hamilton
Tel: 27 41 504 3953 | louise.hamilton@mandela.ac.za

Applied Biostatistics with Excel

Statistical techniques are an essential tool to reach objective conclusions in biology, pharmacy and medical science



Who should attend?

Medical researchers, students and staff involved with the analysis of data. Biostatistics is applied in disciplines such as public health, including epidemiology, nutrition and environmental health; design and analysis of clinical trials in medicine; genomics and population genetics; and ecology and biological sequence analysis.

Why you should attend

It is essential to use statistical techniques to be able to reach objective conclusions in science. Spreadsheet programs, such as Excel, make these techniques accessible for the non-mathematician. It is therefore no longer necessary to purchase expensive and user-unfriendly statistical packages to do statistical analysis as most statistical tests and calculations can now easily be performed by using widely available spreadsheets.

Prior learning requirements

A relevant three year graduate or diploma qualification. Participants must have a good working knowledge of Excel (copy, cut and paste; anchoring of cells; simple graphics; multiply, divide, add and subtract). No previous knowledge of inferential statistics is required.

Course objectives and structure

After completion of this course, the participant will be able to:

- Generate descriptive statistics
- Create graphical displays
- Manipulate and categorize data
- Calculate confidence intervals for means and proportions
- Perform test of significance such as t-tests and one-way ANOVA
- Obtain trend lines and perform a regression analysis

- Perform tests of independence
- Calculate relative risks and associated confidence intervals
- Calculate odds ratios and associated confidence intervals

The course emphasis is on the interpretation of statistical results rather than on the calculation thereof.

Each participant will use her / his personal laptop, which should have the software MS Excel downloaded on it, and will analyse real and relevant data sets under the guidance of the lecturer. We recommend that the participant brings a memory stick so that he / she can download course material for later reference.

The students are evaluated by completing a test on the work covered.

Duration, cost and course dates

Please refer to the "Annual Schedule".

Basic Chemical Engineering for Operators in the Chemical Process Industry

The aim of this short course is to give a broad overview of chemical engineering and to enable Operators to understand the various processes and operations they encounter. It will help the participants to understand the basic principle behind operation and sizing of the equipment used in process industry.



Who should attend?

The short learning programme “Basic Chemical Engineering for Operators in Chemical Process Industry” is aimed at people who wish to be skilled in the field of process operator. The course is geared towards applications of chemical engineering principles in the chemical process industry.

Prior learning requirements

Matric with a minimum of Mathematics APS 4 and Science APS 4, or a C in the previous National Certificate. The student should have passed the “Basic Chemistry” short course and must have two years working experience in the chemical process industry.

Course outcomes

After completion of this course, the participant will:

- Understand the principles behind the operations routinely carried out in the industry
- Evaluate the effects of changes in operating parameters of a process on the performance of the process

The following subjects will be presented:

- Background to Chemical Engineering and Mathematics
- The Manufacturing Process including Sampling Techniques
- Operation of Stationary Equipment
- Operation of Rotational Equipment
- Mass and Energy Balance
- Reaction Kinetics
- Heat Exchangers and Filtration
- Fluid Flow and Crystallization
- Instrumentation

The students are evaluated by completing a test on the work covered.

Duration, cost and course dates

Please refer to the "Annual Schedule".

Basic Chemistry for Operators in the Precious Metal Industry

This course provides a solid knowledge foundation that covers subject and content knowledge of concepts and problem solving skills in basic chemistry.

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Legend:

- Alkali Metals
- Alkaline Earths
- Transition Metals
- Basic Metals
- Semimetals
- Nonmetals
- Halogens
- Noble Gases
- Lanthanides
- Actinides

Who should attend?

The short learning programme “Basic Chemistry for Operators in Chemical Process Industry” is aimed at people who wish to be skilled in the field of process operator. The course is geared towards applications of chemistry in the chemical process industry.

Prior learning requirements

Physical Science and Mathematics on Grade 12 Level.

Course objectives and structure

After completion of this course, the participant will:

- Understand basic chemistry principles
- Understand basic nomenclature for inorganic compounds
- Be able to do basic calculations and chemical reactions

The course addresses the following topics:

- Measurement in experimentation
- Periodic Table
- Atomic structure
- Chemical bonding
- Naming and writing of correct chemical formulas for inorganic compounds
- Matter
- Mole concept and mass
- Solutions
- Chemical reactions in general
- Different types of chemical reactions and the balancing of chemical reaction equations
- Stoichiometrical applications and calculations
- Phases of matter

- Acids and bases
- Nitrogen containing compounds
- Viscosity

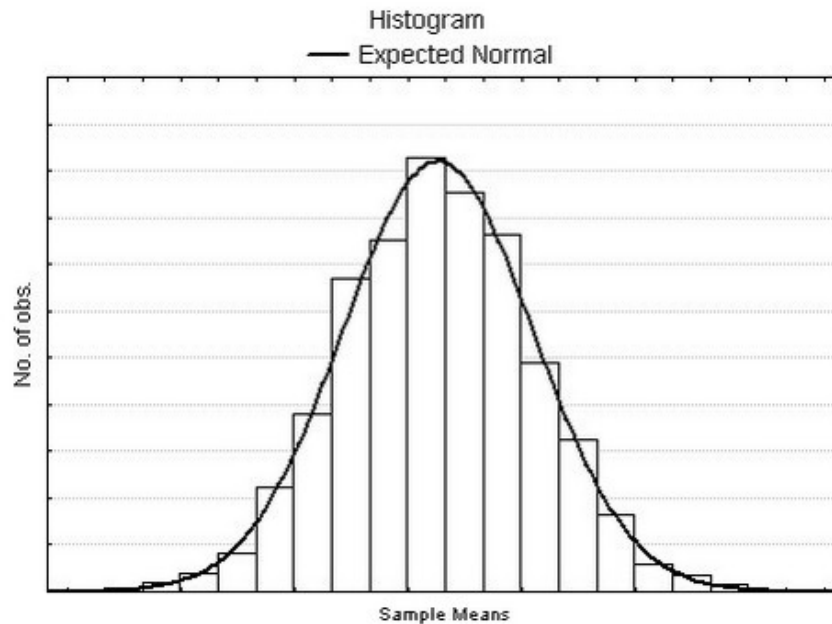
The students are evaluated by completing a test on the work covered.

Duration, cost and course dates

Please refer to the "Annual Schedule".

Data Analysis with Excel for Analysts, Scientists and Engineers

The possibilities of spreadsheets are generally underestimated. By employing the data analysis functions, you can increase your understanding of your data and subsequently improve decision-making



Who should attend?

Scientists, engineers and technologists who want to analyse their data by using practical statistical methods available in Excel.

Prior learning requirements

A relevant three year graduate or diploma qualification. Participants must have a good working knowledge of Excel (copy, cut and paste; anchoring of cells; simple graphics; multiply, divide, add and subtract). No previous knowledge of inferential statistics is required.

Course Learning Outcomes

After completion of this course the student will have a working knowledge of the following:

- Obtain summaries of a given data set (Descriptive statistics) and how to identify patterns or trends. Use Z-scores to identify outliers
- Perform inferential statistical analysis such as calculation of confidence intervals, t-tests, ANOVA, etc
- Perform simple and multiple regression analysis on given data and the validation and use of such regression models to define optimum conditions
- The need and application of an experimental design

The course emphasis is on interpretation of computer output rather than on calculations.

Each participant will use her / his personal laptop, which should have the software MS Excel downloaded on it, and will analyse real and relevant data sets under the guidance of the lecturer. We recommend that the participant brings a memory stick so that he / she can download course material for later reference.

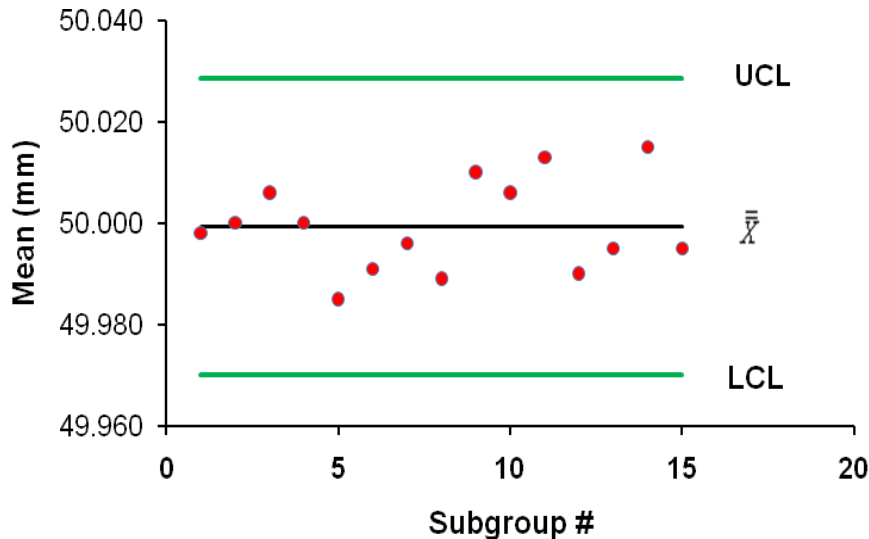
The students are evaluated by completing a test on the work covered.

Duration, cost and course dates

Please refer to the "Annual Schedule".

Quality Control with Excel for Process Operators, Analysts and Engineers

It is essential to use statistical techniques to be able to reach objective conclusions in process control



Who should attend?

Process operators, engineers and persons responsible for maintaining and extending quality control.

Why you should attend

It is essential to use statistical techniques to be able to quantify process variability. Spreadsheet programs such as Excel make these techniques accessible for the non-mathematician. It is therefore no longer necessary to purchase expensive and user-unfriendly statistical packages to do statistical analysis as most statistical tests and calculations can now easily be performed by using widely available spreadsheets.

Prior learning requirements

A relevant three year graduate or diploma qualification. Participants must have a good working knowledge of Excel (copy, cut and paste; anchoring of cells; simple graphics; multiply, divide, add and subtract). No previous knowledge of inferential statistics is required.

Course objectives and structure

After completion of this course, the participant will be able to:

- Obtain descriptive statistics from a set of continuous and categorical data
- Define and interpret the concepts of accuracy, precision, random errors and systematic errors

- Obtain and interpret confidence intervals for averages and proportions
- Perform tests of significance, such as the t-Tests, ANOVA, and interpret their associated p-values
- Perform a bivariate regression analysis and validate the resulting model
- Create and interpret R-charts, S charts and \bar{X} charts based on production data
- Perform a process capability study

The course emphasis is on the interpretation of statistical results rather than on the calculation thereof.

Each participant will use her / his personal laptop, which should have the software MS Excel downloaded on it, and will analyse real and relevant data sets under the guidance of the lecturer. We recommend that the participant brings a memory stick so that he / she can download course material for later reference.

The students are evaluated by completing a test on the work covered.

Duration, cost and course dates

Please refer to the “Annual Schedule”.

Sampling for Chemical Process Operators

Sampling techniques are an essential tool for process operators



Who should attend?

The short learning programme “Sampling” is aimed at process operators who want to enhance their samplings skills.

Prior learning requirements

Matric with a minimum of Mathematics APS 4 and Science APS 4.

Course objectives and structure

After completion of this course, the participant will be able to:

- Generate descriptive statistics
- Create graphical displays
- Manipulate and categorize data
- Calculate confidence intervals for means and proportions
- Perform test of significance such as t-tests and one-way ANOVA
- Obtain trend lines and perform a regression analysis
- Perform tests of independence
- Calculate relative risks and associated confidence intervals
- Calculate odds ratios and associated confidence intervals

The following subjects, including one practical session, will be addressed:

- Introduction to theory of Sampling
- Generic sampling procedures
- Sampling methods
- Sampling preservation
- Sampling of solid material
- Sampling of liquid
- Sampling of gases
- Basic sampling statistics
- pH techniques
- Density
- Specific gravity

The students are evaluated by completing tests on the work covered.

Duration, cost and course dates

Please refer to the “Annual Schedule”.