Haward Technology Middle East

COURSE OVERVIEW GE0001
Data Analysis Techniques for Engineers, Technologists & Managers

Course Title
Data Analysis Techniques for Engineers, Technologists & Managers

Course Date/Venue
September 14-18, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference
GE0001

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description

This practical and highly-interactive course includes various practical sessions and exercises. *Theory learnt will be applied using "MS Excel" applications.*

Continuous improvement in business efficiencies and reducing operations and maintenance costs require managers, engineers and analysts face an ever-challenging analytical problems and performance targets. Therefore, it is essential to base decisions on appropriate analysis and interpretation of numerical data.

The purpose of this course is to give you a working vocabulary such that you will be able to converse easily with people who are experts in the areas of statistics and probability and will be able to read and comprehend most basic textbooks and well-written journal articles. The course will give you the ability to recognize what category a particular problem falls into thereby narrowing the number of possible techniques which might apply.

This course will provide you with a good working knowledge of several of the more common statistical techniques which should cover a high percentage of the types of problems you are likely to run into.

It will give you enough background and theoretical knowledge to recognize when a technique is applicable and when assumptions from which the technique was derived have been so grossly violated that use of the technique will lead to incorrect conclusions.

The course will give you a feel for what to do when your particular problem has violated major assumptions but you need an answer anyway. It will provide you with a manual containing enough worked out examples to serve as a useful future reference. It will provide you with a reasonable reference guide so that you will be able to find more detailed information on the techniques we have introduced. Finally, the course will leave you with a comfortable feeling about the use of statistical and probability techniques.

This course contains detailed techniques for data analysis, experimental design and modelling using statistical and probability methodology. Topics included are: the importance of statistics; probability and Bayes' theorem; applications of probability theory; random variables and their distributions; model fitting; understanding confidence limits; hypothesis testing; experimental design; regression analysis; statistical process control. The theory is extensively illustrated with practical applications.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Gain an in-depth knowledge on data analysis techniques and their applications in science and engineering
- Discuss applied statistics, its importance and the basic statistical concepts
- Acquire knowledge on probability and learn more on its rules and how to calculate it
- Identify discrete and continuous random variables and identify their distributions
- Carryout experiments and the scientific method in data analysis techniques
- Recognize the shortcomings of one-factor-at-a-time experiments and understand the guidelines for designing experiments
- Acquire knowledge on experimental design, two-sample experiments, analysis of variance designs and factorial designs
- Explain the scope of two-level factorial designs and as well as the analysis of the fractional factorial designs
- Describe correlation vs. regression and analyze count and categorical data
- Carryout statistical process control in data analysis techniques

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK**®). The **H-STK**® consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of data analysis techniques for engineers, scientists, technologists and managers whose job includes a major amount of data analysis. It is especially useful for persons who are responsible for planning and carrying out experimental work or data taking. Further, the course is ideal for laboratory managers, chemists and analysts. Participants are encouraged to bring a laptop computer. Participants are also encouraged to bring their own data analysis problems. The instructor will work individually with participants on any problems or data they bring.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Mr. Kyle Bester is a **Senior Water Engineer** with extensive years of practical experience within the **Oil & Gas**, **Power & Water Utilities** and other **Energy** sectors. His expertise includes **Water Reservoir**, **Water Tanks**, **Water Pumping** Station, **Water Distribution** System, **Water Network** System, **Water Pipes & Fittings**, **Water Hydraulic** Modelling, **Water Storage Reservoir**, **Operation & Maintenance** of Water Networks, **Hydraulic Modelling** for **Water Network** Design, **Reservoirs & Pumping** Stations Design & Operation, **Pumping** Systems, Interconnecting **Pipelines**, **Water Network Hydraulic** Simulation Modelling, **Water Supply** Design, **Water Balance Modelling**, **Water Distribution Network**, **Water Network** System Analysis, **Water Forecasts** Demand, **Water Pipelines** Materials & Fittings, **Water Network** System Design, Pump Houses & Booster Pumping Stations, **Potable Water Transmission**, **Water Distribution Network**, Districts Meters Areas (DMAs), **Water Supply & Desalination Plants** Rehabilitation, **Water Reservoirs & Pumping Stations**, **Water Network System** Extension, Water Network System Replacement & Upgrade, **Water Networks** Optimization, **Water Supply & Distribution** Systems Efficiency & Effectiveness, **Pipe** Materials & Fittings, **Service Reservoir** Design & Operation, **Pipes & Fittings**, **Water Network** System Design & Operation, **Supply Water Network** Rehabilitation, **Water Loss** Reduction, **Main Water** System Construction, **Main Water Line** Construction, Transmission & Distribution **Pipelines**, **Water Distribution** Design & Modelling, **Water Supply** System, Oilfield **Water Treatment**, Best Practice in **Sewage** & Industrial **Wastewater Treatment** & Environmental Protection, **Water Distribution** Design & Modelling, **Desilting**, Treating & Handling Oily **Water**, **Water Chemistry** for **Power Plant**, **Water** Sector Orientation, Environmental Impact Assessment (**EIA**), **Potable Water**, **Reverse Osmosis** Treatment Technology and **Chlorination** System, **Well** Inventory, Monitoring & Conservation, **Qualitative Analysis** of Soil & Ground Water, **Water** Networking, **Hydraulic Modelling** Systems, **Pumping** Stations, **Centrifugal Pumps**, **Pipelines & Pumping**, **Water Reservoirs**, **Water Storage Tanks**, Extended Activated **Sludge** Treatment, **Sewage & Industrial Wastewater** Treatment & Environmental Protection, Supervising & Monitoring **Sewage Works**, **Water Desalination** Technologies, **Water Distribution & Pump** Station, Best **Water Equipment** Selection & Inspection, **Hydraulic Modelling** for Water Network Design, **Water Utility** Industry, **Water Desalination** Technologies & New Development, **Water Hydrology**, **Water Conveyors**, **Water Networks** Rehabilitation. He is currently the **Part Owner & Manager** of Extreme Water SA wherein he manages, re-designed and commissioned a water and wastewater treatment plants.

During his career life, Mr. Bester has gained his practical and field experience through his various significant positions and dedication as the **Project Manager**, **Asset Manager**, **Manager**, **Water Engineer**, **Supervisor**, **Team Leader**, **Analyst**, **Process Technician**, **Landscape Designer** and **Senior Instructor/Trainer** for various international companies, infrastructures, water and wastewater treatment plants from New Zealand, UK, Samoa, Zimbabwe and South Africa, just to name a few.

Mr. Bester holds a **Diploma** in **Wastewater Treatment** and a **National Certificate** in **Wastewater & Water Treatment**. Further, he is a **Certified Instructor/Trainer**, an **Approved Chemical Handler** and has delivered numerous courses, trainings, conferences, seminars and workshops internationally.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Fee

US$ 5,500 per Delegate + **VAT**. This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Program

The following program is planned for this course. However, the course Instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1:   **Sunday, 14th of September 2025**

Time	Activity
0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	**PRE-TEST**
0830 – 0930	**Statistics** *What is Statistics? ● Importance of Statistics ● Basic Statistical Concepts*
0930 – 0945	*Break*
0945 – 1100	**Probability** *Rules of Probability ● Probabilities of Joint Events ● Reliability Engineering ● Reliability Systems*
1100 – 1230	**Probability (cont'd)** *Parallel Systems ● Conditional Probabilities ● Bayes Theorem ● Calculating Probabilities*
1230 – 1245	*Break*
1245 – 1420	**Discrete Random Variables** *Bernoulli Distribution ● Binomial Distribution ● Poisson Distribution ● Applications to Practical Problems*
1420 - 1430	**Recap**
1430	*Lunch & End of Day One*

Day 2:   **Monday, 15ᵗʰ of September 2025**

0730 – 0900	**Continuous Random Variables** *Uniform Distribution ● Exponential Distribution ● Lifetime Distributions ● Machine Maintenance ● Skew Distributions*
0900 – 0915	*Break*
0915 – 1045	**Continuous Random Variables (cont'd)** *Normal Gaussian Distribution ● The Lognormal Distribution ● Population and Samples ● Random Sampling*
1045 – 1230	**Experiments and the Scientific Method** *Purpose of the Experiment ● Importance of Experimental Design ● Experimental Design Principles*
1230 – 1245	*Break*
1245 – 1420	**Experiments and the Scientific Method (cont'd)** *One Factor-at-a-Time vs Designed Experiments ● Guidelines for Designing Experiments*
1420 - 1430	**Recap**
1430	*Lunch & End of Day Two*

Day 3:   **Tuesday, 16ᵗʰ of September 2025**

0730 – 0900	**Experimental Design** *Single-Sample Experiments*
0900 – 0915	*Break*
0915 – 1045	**Two-Sample Experiments** *Independent Samples ● Paired Samples*
1045 – 1230	**Analysis of Variance designs** *Single Factor ● Randomized Blocks ● Two Factor Designs*
1230 – 1245	*Break*
1245 – 1420	**Factorial and other Designs** *Higher-Way Factorial Designs ● Balanced Incomplete Blocks Designs ● Nested (Hierarchical) Designs*
1420 - 1430	**Recap**
1430	*Lunch & End of Day Three*

Day 4:   **Wednesday, 17ᵗʰ of September 2025**

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0730 – 0900	**Two-level Factorial Designs** *2^k Factorial Designs ● Analysis of Two-Level Designs*
0900 – 0915	*Break*
0915 – 1100	**Fractional Factorial Designs** *2^{k-p} Fractional Factorial Designs ● Generation and Analysis of Fractional Factorials*
1100 – 1230	**Correlation** *Correlation Coefficient ● Correlation vs Causation*
1230 – 1245	*Break*
1245 – 1420	**Regression** *Simple Regression ● Multiple Regression ● Response Surface Design and Optimization*
1420 - 1430	**Recap**
1430	*Lunch & End of Day Four*

Day 5:   **Thursday, 18th of September 2025**

0730 – 0900	**Analyzing Count Data** *Hypergeometric Distribution ● Binomial Data ● Poisson Data*
0900 – 0915	*Break*
0915 – 1045	**Categorical Data** *Chi-Squared Test for Contingency Tables ● Linear Logistic Regression*
1045 – 1200	**Statistical Process Control** *Shewhart Control Charts ● X-Bar and SD-Charts*
1200 – 1215	*Break*
1215 – 1345	**Statistical Process Control (cont'd)** *CUSUM (Cumulative Sum) Charts ● Process Capability*
1345 - 1400	**Course Conclusion**
1400 – 1415	**POST-TEST**
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

Practical sessions will be arranged for all participants throughout the course using "MS Excel applications".

MS Excel
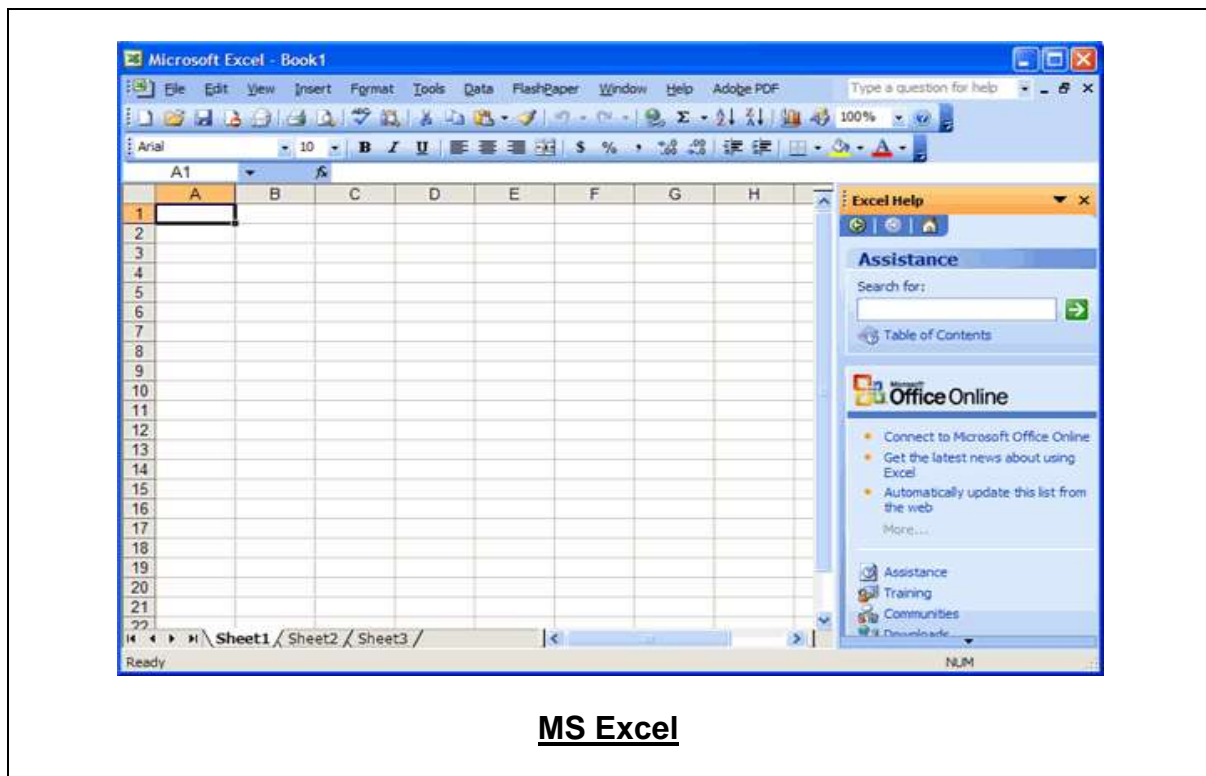
Course Coordinator

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