




2-day In-person Seminar:

Introduction to Industrial Statistics

-  Baltimore, MD
-  June 8th & 9th, 2017
-  9:00 AM to 6:00 PM



William A. Levinson

William A. Levinson, P.E., is the principal of Levinson Productivity Systems, P.C. He is an ASQ Fellow, Certified Quality Engineer, Quality Auditor, Quality Manager, Reliability Engineer, and Six Sigma Black Belt. He is also the author of several books on quality, productivity, and management, of which the most recent is *The Expanded and Annotated My Life and Work: Henry Ford's Universal Code for World-Class Success*.

Overview :

This is an introductory course in industrial statistics that will equip the attendee to understand what he or she needs to know about basic descriptive statistics such as measurements of central tendency (average) and variation (range and standard deviation), and to use graphical methods such as the box and whisker plot to visualize these statistics for data sets. The concepts of variation and accuracy, and their effects on outgoing quality, will be introduced at the beginning. The basic data visualization tools of the histogram and Pareto chart also will be presented.

The next major subject will be statistical hypothesis testing, the foundation of almost everything we do in industrial statistics. The material is applicable not only to statistical process control and acceptance sampling (both of which will be discussed in this course) but also to design of experiments.

Price

Price: **\$1,295.00**

(Seminar for One Delegate)

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Register for 5 attendees

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~~\$6,475.00~~

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***Please note the registration will be closed 2 days (48 Hours) prior to the date of the seminar.*



Agenda:

Day One

Lecture 1:

- How variation and accuracy affect quality; your process as a musket or a rifle.
- Basic statistics: measurements of central tendency and variation.
- Graphical tools: histogram, Pareto chart, box and whisker plot, and scatter diagram. The histogram, Pareto chart, and scatter diagram are three of the traditional seven quality tools (the others being the process flow diagram, control chart, cause and effect diagram, and check sheet or tally sheet).

Lecture 2:

- Compound events (and/or relationships) and application to series and parallel reliability and rolled throughput yield (RTY)
- Statistical hypothesis testing; null and alternate hypothesis, and associated risks
- Discrete (attribute) data distributions: hypergeometric, binomial, and Poisson distributions
- Discovery sampling

Lecture 3:

- The normal or bell curve distribution
 - Cumulative normal distribution, and estimation of the nonconforming (out of specification) fraction of a process
 - The Six Sigma process, and what it really means
 - Introduction to process capability indices
 - Properties of sample averages, and the Central Limit Theorem
- The t distribution
- The chi square distribution; how to test a hypothesis regarding the variation of a process. As an example, did a proposed improvement reduce the process variation?

Day Two

Lecture 1:

- Control charts (SPC)
 - Special or assignable cause variation ("something is wrong") versus random or common cause variation (inherent in the process)
 - SPC and hypothesis testing
- The Rational Subgroup; define it properly to ensure that SPC works properly
- Control charts for attribute data (data that must be measured with integers)
 - np chart for number nonconforming
 - c chart for number of defects
- Control chart interpretation
- Western Electric zone tests

Lecture 2:

- Estimation of process parameters for real-number or continuous scale data
- Tests for normality (bell curve): normal probability plot and Anderson-Darling test
 - If the process data are not normal, process performance indices cannot be calculated accurately with the textbook methods. Alternative methods are however available.
- X chart for individual measurements
- \bar{x} -R and \bar{x} -s charts for sample statistics
- Effects of autocorrelation and between-batch variation
 - How control charts indicate improper selection of the rational subgroup

Lecture 3:

- Measurement System Analysis (MSA), or gage reproducibility and repeatability
 - Precision versus accuracy
 - Repeatability and reproducibility
 - How to perform a MSA
- Attribute gage performance metrics

Group Participation

10%	2 Attendees to get offer
20%	3 to 6 Attendees to get offer
25%	7 to 10 Attendees to get offer
30%	10+ Attendees to get offer

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Kindly get in touch with us for any help or information.

Look forward to meeting you at the seminar

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