



Process Control Design using SPC

(16 hours)

Course Description:

This course is specifically designed to meet the analytical needs of those individuals working within a variety of industries. Course covers the basic concepts and methodologies associated with designing closed loop process controls using statistical process controls for variables and attributes data. Variation assessment, subgroup formation, sample size selection, SPC control chart selection, out of control action plan generation are presented along with measures of process capability.

Attendees:

This course is required for all scientists, engineering and quality professionals who actively work on all aspects of discovery, product and process development where the goal is to characterize, optimize and improve product and process performance.

Course Objectives:

Upon completion of the course the participants will be able to:

- Understand the language and compute the basic statistics associated with SPC
- Apply the ten process control requirements to achieve process control
- Determine rational subgroup formation, sample size and frequency
- Select appropriate control chart for control requirements
- Compute appropriate control limits
- Develop appropriate SPC Charts and associated OCAPs
- Determine process capability
- Describe the roles and responsibilities for using SPC
- Use JMP to analyze process variation patterns, generate SPC charts and determine process capability

Software: JMP, Excel

Prerequisites: ESDA and DOE are recommended courses prior to taking Process Control Design using SPC

Course Outline:

Introduction & Basic Statistics

SPC a basis for control
Basic statistics
Normal distribution
Standard error of the mean
Central limit theorem

Ten Requirements for Designing Effective Process Control

Clear product specifications
Effective metrology



- Process characterization
- Sampling plan
- Control chart selection (variables and attributes)
- Alarms and out of control action plans (OCAP)
- Process documentation
- Operator and engineering training
- Database
- Routine line audits

Process Capability

- Determining process stability prior to computation of capability
- Cp and Cpk
- Sigma and z as measures of process capability
- Tests for normality
- Distribution fitting for nonnormal parameters

Process Control Implementation Roles & Responsibilities

- Management
- Process Engineer
- Process Control Specialist
- Supervisor
- Operator