**Advanced Test Design & Data Analysis**

This 5-day course is designed for those who want a review of and/or a broader and more in-depth coverage of Design of Experiments (DOE), Measurement System Analysis (MSA), and Regression Analysis, along with other related topics such as Robust Design, High Throughput Testing, and Fitting Data with Distributions. Big Data with Predictive Analytics and Design for Reliability are also introduced.

Definitive Screening Designs and D-Optimal designs are some of the additional designs that will be covered in this course. Logistic regression is introduced to complement the traditional least squares regression. MSA techniques are extended to cover attribute data with and without reference values, as well as destructive measures and nested MSAs. Overall, this course will provide broader meaning and greater understanding of the concepts the student has previously been exposed to, and it will allow them to collect data in a more efficient and effective manner. It will provide students the ability to think more critically about their data analyses to make sure they are drawing accurate conclusions about the data, helping to form better business decisions.

**Prerequisites for course attendance:**

The student is expected to have a background in MSA and DOE. This course can serve as credit toward Air Academy Associates’ Black Belt and Master Black Belt certifications. Completion of Air Academy’s Lean Six Sigma Black Belt or DFSS Green Belt curriculum will qualify the candidate. Additionally, those who have taken the DFSS Foundations course, or equivalently, the Operational DOE/STAT class, are also qualified to attend.

# Course Materials:

Participants receive the following materials, which are integrated and used throughout the class:

* Participant Guide

Required Software (not provided): Quantum XL

**Course Overview:**

1. Introduction to Critical Thinking

Advanced Statistical Tools

1. Advanced Measurement System Analysis (MSA) Techniques
2. Advanced Hypothesis Testing
3. Describing Data with Distributions
4. Historical Data Analysis
5. Logistic Regression

Advanced DOE Tools

1. Screening Designs
2. Modeling Designs
3. Validation Testing
4. Robust Design

Special Topics

1. Big Data and Predictive Analytics
2. An Introduction to Design for Reliability
3. References, Acronyms, and Course Evaluation