Statistical Quality Control

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1. Course Description
The following contents will be learned.
(1) Estimation of average value and true value, and confidence level.
(2) Error, variation, and tolerance.
(3) Variance and analysis of variance table.
(4) Orthogonal array and analysis of variance.
(5) Quality Engineering and Experimental Design and Reliability Engineering.
(6) Least square method and orthogonal polynomials.
(7) Evaluation using a small number of samples.
In this lesson, knowledge, techniques, and attitudes regarding DP 2, DP 3, DP 4, and DP 5 will be acquired.

2. Course Objectives
Students can understand and apply the meanings of various numerical values and numerical analysis methods, necessary for estimating from samples to the state of mass-produced products.

3. Grading Policy
Your grade in the class will be decided on the evaluate with 100% of the result of the final exam. An explanation will be given after the end of the final exam.

4. Textbook and Reference
Textbook
TAGUCHI Genichi   Quality engineering at development / design stage   Japanese Standards Association

5. Requirements(Assignments)
(1) As preparations for next lesson, please check the meaning of the proper noun and the contents of the relationship shown in the contents of lesson, and come to the class. (90 minutes)
(2) As a review, please solve exercises applied to the items instructed during the lesson, so that you can cope with works in pair as appropriate in the next lesson. (90 minutes)

6. Note
Use a calculator with functions such as logarithm, average value, and standard deviation. If you want to take Quality Engineering, please take it.

7. Schedule

[1]	Estimation of average value and true value.
[2]	True value estimation and confidence level.
[3]	Error and variation, and exercises in pairs.
[4]	Variation and tolerance.
[5]	Deviation and variance.
[6]	Variance and analysis of variance table, and exercises in pairs.
[7]	Orthogonal array L16 and L27.
[8]	Analysis of variance table in orthogonal array L18, and exercises in pairs.
[9]	Relationship between Quality Engineering and Experimental Design.
[10]	Relationship between Quality Engineering and Reliability Engineering.
[11]	Least square method.
[12]	Orthogonal polynomials for unequally spaced levels.
[13]	Orthogonal polynomial for equally spaced levels, and exercises in pairs.
[14]	Concept of evaluation with a small number of samples considering variations.
[15]	Summary.