

Course

BAE4151 – Quality and Improvement

Half semester 4 hours per week (equals 2 SWS), 3 credits, English level: upper

Instructors

Prof. Dr. Kai Oßwald

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Overview

The course deals with the most relevant methods of production metrology, quality control and improvement. All methods are focused on industrial serial production.

Due to the current pandemic, in winter semester of 2020/21 a number of changes to this course will be necessary. I will inform you as soon as possible.

Prerequisites:

Fertigungstechnik 1 and 2, Konstruktionslehre, Produktion 1, Production Engineering and Manufacturing, Advanced English for Engineers

Learning Objectives

By the end of the course students

- will have a thorough knowledge on production metrology, quality control and improvement.
- will have practical experience with the measurement and analysis of products from industrial manufacturing processes.
- will have authored a lab report, observing the rules of academic writing in engineering.

Course Topics

Lecture: (in the winter semester 2020/21 the lecture will most likely take place via Alfaview)

Introduction

Production Metrology

Six Sigma

Statistical Process Control

Improvement Methods

Lab Reports

Tutorial: (in the winter semester 2020/21 the tutorial will most likely take place via Alfaview)

Sample calculations and data Analysis

Lab: (most probably, special rules will apply for the lab session in the winter semester 2020/21)

- Investigations into the gauge
 - a calibration of the gauge
 - a determination of the gauge capability
 - a determination of the measurement uncertainty
 - a determination of the Gage Range and Repeatability

- Investigations into the manufacturing process
 - a control chart and/or box plot for at least one feature
 - a determination of the process capability for at least one feature

Teaching and learning approach

The course will start as a “classical” lecture followed by a tutorial session where sample calculations and data analysis will be trained. The main part will be the investigation into one specific production process and one specific measurement device.

Contribution to program goals

Goals	Contribution
Engineering Knowledge	Introduction to the industrial and automated production as well as its machines and methods
Critical thinking and analytical competence	Analytical tool set for important quality and improvement toolsets
Communication skills	Authoring a lab report

Course Material

- Handbook on Continuous Improvement Transformation, Aristide van Aartsengel, Selahattin Kurtoglu, Springer, Berlin, Heidelberg, 2013, [Ebook](#)
- Leading processes to lead companies: Lean Six Sigma, Gabriele Arcidiacono, Claudio Calabrese, Kai Yang, Springer, Milano, 2012, [Ebook](#)
- Six Sigma+Lean Toolset, Stephan Lunau, Alexander John, Renata Meran, Olin Roenpage, Christian Staudter, Springer, Berlin, Heidelberg, 2008, [Ebook](#)

Final Examination

The Lab Reports will be graded.

Grading

Students will be graded on a scale of 1 = excellent, 2 = very good, 3 = satisfactory, 4 = pass and 5 = fail.

My Teaching Philosophy

I want to contribute to your learning progress in terms of technical understanding and engineering abilities. I will try to show you the practical importance of the issues of this course. Questions – during the course or during my office hours – are very welcome and will be answered either in the course or individually.