

Syllabus  
**BAE4151 Quality and Improvement**  
Prof. Dr. Kai Oßwald  
Summer Semester 2024

<b>Level</b>	Bachelor	
<b>Credits</b>	3	
<b>Student Contact Hours</b>	2	
<b>Workload</b>	90 Hours	
<b>Prerequisites</b>	Fertigungstechnik 1+2 Konstruktionslehre Produktion 1 Production Engineering and Manufacturing Advanced English for Engineers	
<b>Time</b>	s. LSF	
<b>Room</b>	s. LSF	
<b>Start Date</b>	s. LSF	
<b>Lecturer(s)</b>	<b>Name</b>	Prof. Dr. Kai Oßwald
	<b>Office</b>	T2.2.14
	<b>Office Hours</b>	Wednesday 09:45-11:15
	<b>Phone</b>	(07231) 28-6461
	<b>Email</b>	Kai.osswald@hs-pforzheim.de

## Summary

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

## Outline of the Course

### Lecture:

Introduction  
Production Metrology  
Six Sigma  
Statistical Process Control  
Improvement Methods  
Lab Reports

### Tutorial:

Sample calculations and data Analysis

### Lab:

Investigations into the gage

- a calibration of the gage
  - a determination of the gage 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

## Course Intended Learning Outcomes and their Contribution to Program Intended Learning Outcomes / Program Goals

Goals	Contribution
LO 1.2 Engineering Knowledge	Introduction to the industrial and automated production as well as its machines and methods
LO 3 Critical thinking and analytical competence	Analytical tool set for important quality and improvement tool-sets
LO 5.1 Communication skills	Authoring a lab report

## 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.

## **Literature and Course Materials**

- 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

## **Assessment**

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.

## **Schedule**

N/A

## **Academic Integrity and Student Responsibility**

N/A

## **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.

## **Additional Information**

### **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.