

Syllabus
BAE4151 Quality and Improvement
Marvin Fuchs & Prof. Dr. Kai Oßwald
Winter Semester 2024/2025

Level	Bachelor	
Credits	3	
Student Contact Hours	2	
Workload	90 Hours	
Prerequisites	Fertigungstechnik 1+2 Konstruktionslehre Produktion 1 Production Engineering and Manufacturing Advanced English for Engineers	
Time	s. LSF	
Room	s. LSF	
Start Date	s. LSF	
Lecturer(s)	Name	Marvin Fuchs (Prof. Dr. Kai Oßwald)
	Office	T1.1.12 (T2.2.14)
	Office Hours	Please send me an email (Wednesday 09:45-11:15)
	Phone	(07231) 28-6432 (07231) 28-6461
	Email	marvin.fuchs@hs-pforzheim.de 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.