HS PF

Syllabus

BWI10133 Quality and Improvement

Prof. Dr.-Ing. Irina Mazilu-Eyaz

Winter Semester 2025/26

Level	Bachelor	
Credits	3	
Student Contact Hours	2	
Workload	90	
Prerequisites	Fertigungstechnik 1+2 Konstruktionslehre Produktion 1 Production Engineering and Manufacturing Advanced English for Engineers	
Time	Tuesday 9:45-11:15	
Room	s. LSF	
Start Date	s. LSF	
Lecturer(s)	**Name**	Prof. Irina Mazilu-Eyaz
	Office	T1.5.25
	Virtual Office	Auf Anfrage
	Office Hours	Mittwoch 13:45 – 15:15 / Please send me an email
	Phone	07231 28 6462
	Email	Irina.Mazilu-Eyaz@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

Program Intended Learning Outcomes		Course Intended Learning Outcomes
	After completion of the program the students will be able…	After completion of the course the students will be able…
1	**Expert Knowledge**	
1.2	...to demonstrate their solid key knowledge in Mechanical Engineering.	to understand the fundamentals of industrial and automated production, including its machines and methods.
2	**Digital Skills**	
3	**Critical Thinking and Analytical Competence**	
3.2	...to critically reflect and interpret findings and to develop comprehensive solutions for complex problems.	understand the fundamentals of industrial and automated production, including its machines and methods, as well as utilize an analytical toolset for key quality and improvement processes.
5	**Communication and Collaboration Skills**	
5.1	...to express complex issues effectively in writing.	to author a lab report.
6	**Internationalization**	

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

Please note that audio and video recordings during lectures, seminars and labs are permitted only with the explicit consent of the lecturer and all other persons present. Without this consent, recordings are not allowed.

Code of Conduct for Students

- Read the syllabus.
- Come to the lecture prepared.
- Review previous lectures regularly and complete exercises.
- Arrive on time and do not leave early.
- Behave respectfully towards other students. Do not disturb the lecture by talking to each other. Your questions may be relevant to everyone.
- Work fairly, cooperatively, and consistently. If you encounter serious problems, consult the instructor.
- Link to the Code of Conduct for online Teaching

Teaching Philosophy

My aim is not only to provide you with theoretical knowledge, but also to demonstrate the practical importance of quality and production metrology. This subject should give you a sound understanding of the basics so that you can act confidently and competently in your future professional practice.

To ensure that the learning process is profitable for everyone, I would like to encourage you:

- **Questions and comments:** If possible, ask comprehension questions directly during the lecture. Your comments, which help to clarify or deepen the topics, are always welcome. Of course you can also ask questions afterwards.

- **Personal responsibility:** The essential part of the learning success is in your hands. Without thorough preparation and follow-up of the lecture content, it is hardly possible to achieve the desired learning objectives.

The topics of quality and production metrology are complex and require step-by-step understanding and application. Plan about as much time for the preparation and follow-up of the content as the lecture itself takes. This investment will help you to successfully complete the course and acquire the knowledge that is required in practice.

Additional Information

Teaching Language English

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.