University *of Ljubljana*
Faculty *of Mechanical Engineering*

Quality Engineering 5 ECTS

Lecturer: **D. Kramar, T. Berlec**

Lectures: 30h | Tutorials: 15h | Labs: 10h | Project: 5h | Lang. :

Objectives

The objectives of this course are to make students aware of the importance of quality in today's world of waste and challenges in the use of raw materials. The future may be uncertain, but good quality management will enable organisations to adapt to the changing demands of a sustainable and people-friendly society.
This course will thus browse:

- The introduction to quality engineering with theoretical background and practical knowledge
- The overview of the tools and techniques of quality control and assurance and other elements of the quality management system.
- The methods of design of experiments and their application in empirical modelling and process optimization
- The application of tools and techniques of quality assurance/control in all stages of the product quality development, process planning and control

Programme

1. Introduction to Quality engineering
2. Quality Tools (7QC) and Statistical Process Control (SPC)
3. Problem solving techniques (8D, A3, 5W)
4. measurements in industry and Measurement System Analysis (MSA)
5. Risk management and Failure Mode and Effects Analysis (FMEA)
6. Product quality development, process planning and control (APQP)
7. Design of Experiments (DoE)
8. Quality management systems (Lean production, ISO, IATF)

Prerequisites

In order to successfully achieve this course, the students must have:

- Good knowledge in measurements in mechanical engineering
- Good knowledge in technical drawing and 3D modelling
  Basic knowledge in data processing and evaluation

Learning outcomes

After attending this course, the student will:

- become familiar with the quality tools and techniques of statistical process control,
- become aware of the importance of measurement techniques and acquire the ability to select appropriate measurement systems in the manufacturing process,
- learn the methods of design of experiments and their application in empirical modelling and process optimization,
- acquire the competence to apply quality tools and techniques of quality assurance/control in all stages of the product quality development, process planning and control.

Assessment

Contribution to the final grade:

- 50% theoretical written exam (lectures).
- 30% laboratory work (including reports).
- 20% seminar work as home assignment.

Literature

T. Pyzdek, P. A. Keller: Quality engineering handbook. Marcel Dekker, Inc., New York, 2003.
R. Basu: Implementing Quality – A Practical Guide to Tools and Techniques, Thomson Learning, London, 2004
J. Antony: Design of Experiments for Engineers and Scientists; Elsevier 2014