



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Quality engineering 1

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### Course

Field of study

Safety Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

3/5

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

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### Number of hours

Lecture

15

Tutorials

Laboratory classes

15

Projects/seminars

Other (e.g. online)

### Number of credit points

3

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### Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

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## Prerequisites

Basic knowledge of technical issues, statistics and work organization

## Course objective

Acquiring knowledge and skills related to engineering aspects of product and process quality, in particular regarding quality evaluation, methods of product quality control as well as critical process control points and their supervision

## Course-related learning outcomes

### Knowledge

1. Student knows the basic methods, techniques and tools used in quality engineering [P6S\_WG\_07].
2. Student has expanded, theoretically founded general knowledge related to statistical methods used in process control and product control [P6S\_WG\_07]

### Skills

1. Student is able to obtain information from literature, databases and other sources; interpret and critically evaluate them, can form opinions related to the causes and errors of production resulting in a decrease in the quality of production [P6S\_UW\_07].
2. Student is able to effectively use methods and tools used in quality engineering [P6S\_UW\_07]

### Social competences

1. Student understands that knowledge and skills in identifying problem / incompatibility analysis needs to be systematically supplemented, recognizes the cause-and-effect relationship between events / incompatibilities and can rank and prioritize them [P6S\_KK\_01; P6S\_KK\_02].

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formative assessment:

- a) laboratory classes: assessment of current progress of task implementation
- b) lectures: answers to questions about the content of previous lectures,

Summative rating:

- a) laboratory classes: presentation of reports on exercises performed (arithmetic average of partial grades);
- b) lectures: pass a test questions, scored on a two-point scale of 0, 1. Passing threshold: 50% of the points.

## Programme content

Lecture:



Basic concepts related to quality, product quality features, quality engineering in product design, manufacture, operation and utilization, quality assessment and analysis, quality control and control, tools and methods of quality control and SKO and SPC control, visualization tools, determining causes and effects and determining the importance of problems affecting product quality.

laboratory classes:

Tools used to visualize quality problems: flowchart, process map, control sheet - examples. Tools used to identify the causes and effects of quality problems: Ishikawa diagram, relationship diagram, matrix diagram - examples. Tools used to determine the importance of problems with quality, e.g. the Pareto-Lorentz diagram.

### Teaching methods

1. Lecture: multimedia presentation, illustrated with examples on the board.
2. Laboratory classes: multimedia presentation illustrated with examples given on a blackboard and performance of tasks given by the teacher - practical exercises.

### Bibliography

#### Basic

Bamford, D.R. and Greatbanks, R.W. (2005), "The use of quality management tools and techniques: a study of application in everyday situations", *International Journal of Quality & Reliability Management*, Vol. 22 No. 4, pp. 376-392. <https://doi.org/10.1108/02656710510591219>, <https://www.emerald.com/insight/content/doi/10.1108/02656710510591219/full/html?skipTracking=true>

Mazur A., Gołaś H., *Zasady, metody i techniki wykorzystywane w zarządzaniu jakością*, Wydawnictwo Politechniki Poznańskiej, ISBN 978-83-7143-908-7, Poznań 2010, s. 113.

<http://index-of.co.uk/IT-managment/introduction-to-statistical-process-control.pdf>

Prussak W., Jasiulewicz-Kaczmarek M., *Elementy inżynierii systemów zarządzania jakością*. Wydawnictwo Politechniki Poznańskiej, Poznań 2010 .

Application of 7 QC Tools to Investigate the Rejection of Lathe Beds – Case Study of a Machine Tool Manufacturing Company <https://www.sdmimd.ac.in/SDMRCMS/cases/CIM2015/4.pdf>

#### Additional

Grudowski P., Przybylski W., Siemiątkowski M.: *Inżynieria jakości w technologii maszyn*. Wydawnictwo Politechniki Gdańskiej, Gdańsk 2006.



### Breakdown of average student's workload

|   | Hours | ECTS |
|---|-------|------|
| Total workload  | 75    | 3,0  |
| Classes requiring direct contact with the teacher   | 35    | 1,5  |
| Student's own work (literature studies, preparation for laboratory classes, preparation for tests) <sup>1</sup> | 40    | 1,5  |

<sup>1</sup> delete or add other activities as appropriate