



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Contemporary Concepts and Methods of Quality Management

### Course

Field of study

Engineering Management

Area of study (specialization)

Managing Enterprise of the Future

Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

English

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

Tutorials

15

Projects/seminars

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

Ph.D., D.Sc., Eng. Małgorzata Jasiulewicz-Kaczmarek, University Professor

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Responsible for the course/lecturer:

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### Prerequisites

Student defines and describes the basic concepts and principles in the field of quality management, the foundations of organization and management. The student is able to verify and evaluate phenomena occurring during the implementation of processes in enterprises and has the ability to interpret and describe the observations and observations. The student is aware of the importance of quality for its recipients and creators of its level. The student is aware of the need to shape products and processes, taking into account quality, normative and legal requirements.



### Course objective

Presenting the essence of using modern methods and tools in quality management. Acquisition by students of the practical ability to apply quality management methods and tools in processes, ventures, products and systems.

### Course-related learning outcomes

#### Knowledge

The student identifies methods and tools for modeling decision-making processes used in quality management, including DMAIC and DMADV cycles within the Six Sigma concept [P7S\_WG\_02].

The student characterizes the application of mathematical statistics to the analysis and modeling of quality processes, including understanding process variation and measurement systems [P7S\_WG\_03].

The student describes research techniques and methodologies used in quality management [P7S\_WG\_04].

The student explains market data acquisition methods that are key to quality analysis and improvement [P7S\_WG\_07].

#### Skills

The student applies theoretical knowledge to analyze and evaluate processes and phenomena related to quality management, formulating methods for their improvement [P7S\_UW\_01].

The student uses advanced methods and tools to forecast and model complex quality processes [P7S\_UW\_02].

The student analyzes and explains how social and economic phenomena affect quality management and organizations [P7S\_UW\_06].

The student formulates hypotheses about processes and phenomena in the context of quality and verifies them through research [P7S\_UW\_07].

The student critically analyzes existing technical solutions in quality management and proposes their improvements [P7S\_UW\_09].

#### Social competences

The student analyzes and presents the necessity of interdisciplinary cooperation in the field of quality management, identifying specific examples of cooperation between different disciplines and departments in the organization and explaining how this cooperation contributes to quality improvement [P7S\_KK\_01].

The student identifies and analyzes cause and effect relationships in quality management processes, which allows for effective problem solving and decision making [P7S\_KK\_02].

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:



Formative assessment: answers to questions regarding the content of previous lectures

Summative assessment: The pass a test questions, scored on a two-point scale of 0, 1. Passing threshold: 50% of the points.

Tutorials:

Formative assessment: assessment of the current progress of the implementation of tasks, for each task the student receives a partial assessment.

Summative assessment: arithmetic average of partial grades obtained for individual tasks. Passing threshold: 50% of the points.

Laboratory classes:

Formative assessment: assessment of the current progress of the implementation of tasks, for each task the student receives points.

Summative assessment: sum of points obtained for tasks and final test. Passing threshold: 50% of the points.

### Programme content

Lecture: Definition and essence of the SIX SIGMA concept, the DMAIC and DMADV cycle, tools and methods used in the various phases of the cycle

Tutorials: use of 7 old and 7 new tools, application of these tools in in-depth G8D analysis.

Laboratory classes: process variation (short and long term - SPC) and measurement system variation (MSA for measurable (R&R) and attributes (KAPPA))

### Teaching methods

Lecture: multimedia presentation illustrated with examples given on the board.

Tutorials: multimedia presentation illustrated with examples given on the blackboard and carrying out the tasks given by the teacher - practical exercises.

Laboratory classes: a multimedia presentation illustrated with examples given on the blackboard and the performance of laboratory exercises given by the teacher.

### Bibliography

Basic

Define-Measure-Analyze-Improve-Control (DMAIC)

<https://cdn.ttgtmedia.com/searchSoftwareQuality/downloads/ect01TreasurechestSixSigma.pdf>

8D Method Overview for Suppliers, 2021 [https://media3.bsh-group.com/Documents/Overview\\_ProblemSolving\\_with\\_8D\\_Method\\_EN.pdf](https://media3.bsh-group.com/Documents/Overview_ProblemSolving_with_8D_Method_EN.pdf)



MSA 4 th. Edition Quick Guide

[https://www.rubymetrology.com/add\\_help\\_doc/MSA\\_Reference\\_Manual\\_4th\\_Edition.pdf](https://www.rubymetrology.com/add_help_doc/MSA_Reference_Manual_4th_Edition.pdf).

PN-EN 60812:2009 EN 60812:2009. Analysis techniques for system reliability: procedure for failure mode and effects (FMEA)

Additional

ISO 18404:2015(en) Quantitative methods in process improvement — Six Sigma — Competencies for key personnel and their organizations in relation to Six Sigma and Lean implementation

Antosz K., Augustyn A., Jasiulewicz-Kaczmarek M., Application of VSM for improving the medical processes - case study, APMS 2021 IFIP AICT Springer

### Breakdown of average student's workload

	Hours	ECTS
Total workload	55	2,0
Classes requiring direct contact with the teacher	45	1,5
Student's own work (literature studies, preparation for laboratory classes, preparation for tutorials, preparation for tests). <sup>1</sup>	10	0,5

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