COURSE DESCRIPTION CARD - SYLLABUS

Course name
Quality management and engineering [S1ZiIP2>ZiIJ]

Course

Field of study
Management and Production Engineering

Year/Semester
3/5

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other
0

Tutorials
15

Projects/seminars
15

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

Has knowledge of the basics of management, production management, manufacturing methods, and basic mathematical statistics.

Course objective

Learning and understanding the importance of quality in the product life cycle. Learning and acquiring skills in practical application of basic principles, methods and tools of quality management and quality engineering. Gaining knowledge and skills in determining the quality capability and stability of the process, assessing product quality, and surveying consumer satisfaction. Learning the principles of quality management systems, system design methodology and the procedure for obtaining a certificate. Awareness of the engineer's responsibility for the quality of products.

Course-related learning outcomes

Knowledge:
The student has knowledge of:
- quality oriented design of products and their manufacturing processes
- methods of assessing the quality capability of manufacturing processes and statistical process control

- methods of product quality control and customer satisfaction research
- the principles of quality management, including the principle of continuous improvement
- quality management systems, their design and certification

Skills:
The student is able to:
- conduct FMEA analysis of the process
- collect data on the quality of the process or product, determine sample statistics or population parameters and on this basis assess the quality capability of the process, quality stability of the process or the quality level of the product batch
- able, using appropriate tools and methodologies, to identify problems occurring in processes, as well as indicate the possibilities of their solution
- design basic documents of the quality management syste

Social competences:
The student:
- can cooperate and lead a team performing tasks in the field of quality management and quality engineering
- is creative, can working in a team and is able to justify their decisions and is aware of the responsibilities resulting from them
- is able to engage in solving problems
- can independently develop and expand his competences

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lectures
Are based on a multiple choice test. The test contains 50 questions. Minimum passing score is 50% correct answers. Exam is conducted at the end of the semester
Assignment of grades to percentage ranges of results: <90-100> very good; <80-90) good plus; <70-80) good; <60-70) satisfactory plus; <50-60) satisfactory; <0-50) unsatisfactory.
Exercises
Are based on completed tasks within the scope specified in the exercise program
Project
Based on the completed and presented project

Programme content

Perception and importance of quality in the product life cycle. Principles, functions, methods and tools of quality management. Capability and stability of the process. Product quality assessment. Consumer satisfaction research. Quality management systems. Designing and maintaining quality management systems. Quality economics.

Course topics

Lecture:
Scope of quality engineering and quality management
Definition and aspects of quality. Quality properties of products. Quality in the product life cycle. Quality of design, process quality, performance quality, functional quality
Quality assessment. Product and process quality measures. Customer satisfaction
Quality planning, assurance and control
Principles, methods and tools of quality management
Methods of product and process quality oriented design, identification of customer expectations and requirements, QFD analysis, assessment of risk of non-fulfillment of requirements, FMEA analysis
Product and process inspection. Selection of inspection and measurement equipment
Quality capability indicators
Statistical process control (SPC), control cards
Statistical acceptance inspection
Product quality assurance in product distribution and exploitation
Quality improvement. Improvement methodologies (PDCA, DMAIC)

Quality improvement strategies: TQM, Six Sigma
Quality management systems meeting the requirements of ISO 9000.
Quality system design
Audit, certification and maintenance of quality systems
Economic aspects of quality management.
Exercises
Determination of quality capability indicators and design and application of a process control card
Use of quality tools in identifying problems and implementing improvement actions; process improvement using the DMAIC methodology
Creation of quality management system procedures
Project
Application of QFD methodology in product design
Product and process failure mode and effects analysis; FMEA

Teaching methods

Lecture: lectures illustrated with a multimedia presentation containing the discussed program content
Exercises: solving problems and tasks
Project: development and defense

Bibliography

Basic:
Hamrol A.: Zarzadzanie i inżynieria jakości. Wydawnictwo Naukowe PWN, Warszawa 2017
Hamrol A.: Zarzadzanie i inżynieria jakości. Ze spoijerzeniem w Reczywistość 4.0. Wydawnictwo Naukowe PWN, Warszawa 2022
Zymonik Z., Hamrol A., Grudowski P.: Zarządzanie jakością i bezpieczeństwem. Polskie Wydawnictwo Ekonomiczne, 2013

Additional:
Starzyńska B.Hamrol A., Grabowska M.: Poradnik menedżera jakości. Kompndium wiedzy o narzedziach jakosci. Wydawnictwo Polietchniki Poznańskiej, Poznań 2010
Szczepańska K.: Koszty jakości dla inżynierów. Wydawnictwo Placet. Warszzawa 2009

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	47	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	28	1,00