

Design for Quality - opis przedmiotu

Informacje ogólne	
Nazwa przedmiotu	Design for Quality
Kod przedmiotu	06.9-WM-MaPE-QE-P-DQ- 23
Wydział	Wydział Mechaniczny
Kierunek	Management and Production Engineering
Profil	ogólnoakademicki
Rodzaj studiów	pierwszego stopnia z tyt. inżyniera
Semestr rozpoczęcia	semestr zimowy 2023/2024

Informacje o przedmiocie	
Semestr	5
Liczba punktów ECTS do zdobycia	2
Występuje w specjalnościach	Quality Engineering
Typ przedmiotu	obowiązkowy
Język nauczania	angielski
Sylabus opracował	doc. dr inż. Julian Jakubowski

Formy zajęć					
Forma zajęć	Liczba godzin w semestrze (stacjonarne)	Liczba godzin w tygodniu (stacjonarne)	Liczba godzin w semestrze (niestacjonarne)	Liczba godzin w tygodniu (niestacjonarne)	Forma zaliczenia
Wykład	15	1	-	-	Zaliczenie na ocenę
Projekt	15	1	-	-	Zaliczenie na ocenę

Cel przedmiotu

The aim of the course is to familiarize students with design methods for quality in the product life cycle, ways to identify factors that most strongly affect the quality of products or processes and use them to design a product or process resistant to interference that may reduce quality, ensure that the quality of workmanship is as close as possible to the design quality and control the quality of the product during its manufacture and operation

Wymagania wstępne

Basics of metrology, basics of engineering design, mathematical statistics, materials science

Zakres tematyczny

Lecture

- 1: The structure of the design process. Design methods for quality.
- 2: Experimental methods in product and process design (Shainin method, Taguchi method).
- 3: Defect cause and effect analysis (FMEA). Defect tree analysis (FTA). QFD method.
- 4: Design quality according to Deming. The quality of the design process.
- 5: Control methods, including statistical control techniques. Statistical acceptance control. Statistical process control.
- 6: Teamwork methods: brainstorming, incompetence, pros and cons, quality wheels.
- 7: Selected quality support techniques: 8D report, 5S method, 5-Why method. The concept of technological, criteria and rules for selecting the optimal technological process. Requirements necessary to be met in the product design process in order to obtain the technological nature of the structure.
- 8: Current trends in the development of manufacturing techniques with particular emphasis on factors affecting the reduction of production costs (reduction of energy consumption and consumption of materials, automation) while increasing the quality of products.

The following issues are developed within the laboratory:

- L1: Development of design assumptions for machine or subassembly parts, taking into account the conditions of use,
- L2-L3: Develop a detailed seven-step teamwork plan.
- L4-L7: Selection of adequate design methods for quality for the selected product. Application of selected methods (from the lecture) for pro-quality design
- L8: Solutions Presentation

Metody kształcenia

Lecture - conventional.

Lab: teamwork and with source document

Efekty uczenia się i metody weryfikacji osiągnięcia efektów uczenia się

Opis efektu	Symbole efektów	Metody weryfikacji	Forma zajęć
Is able to interact and work in a group, taking on different roles	K_K03	- bieżąca kontrola na zajęciach - wykonanie sprawozdań laboratoryjnych	Projekt
Has structured general knowledge in the field of project management with particular emphasis on the qualitative aspects of the design process	K_W23	- kolokwium - projekt	- Wykład - Projekt
Can document the course of work in the form of a test or measurement report and develop test results and present them in the form of a clear report	K_U02	wykonanie sprawozdań laboratoryjnych	Projekt
He has knowledge of development trends and new achievements in the area of Management and Production Engineering in the field of methods, tools and applications used in quality management	K_W04	- kolokwium - projekt	- Wykład - Projekt
Is able to obtain information from literature, databases and other sources, integrate them, interpret them and draw conclusions and form opinions	K_U01	- bieżąca kontrola na zajęciach - projekt	Projekt
Can prepare documentation related to quality engineering in production processes	K_U15	- aktywność w trakcie zajęć - bieżąca kontrola na zajęciach	Projekt
It has a wide range of workshop metrology, including modern measurement techniques	K_W15	- aktywność w trakcie zajęć - kolokwium	- Wykład - Projekt

Warunki zaliczenia

Lecture – the condition for passing the lecture part is to obtain a positive assessment from the colloquium including verification of knowledge of basic issues. The student gets 5 questions about the issues of the subject. The exam grade consists of grades from 5 exam questions. The average grade of 5 questions is entered.

Laboratory – the condition for passing the laboratory is to obtain a positive assessment from the submitted report on an electronic carrier and substantive justification of the adopted solutions. Assessment determined on the basis of the component assessing skills related to the implementation of laboratory tasks.

Course credit: The final grade for passing the course is the arithmetic average of the grades for individual forms of classes.

Literatura podstawowa

1. Krzysztof Sacha Software Engineering Techniques: Design for Quality. IFIP Advances in Information and Communication Technology. Springer, 2006
2. Theodore T. Allen Introduction to engineering statistics and six sigma: statistical quality control and design of experiments and systems. Springer, London, 2006
3. Latif Al-Hakim, Latif Al-Hakim Quality Management: Theory and Applications. IGI Global 2006.

Literatura uzupełniająca

David Hoyle ISO 9000 Quality Systems Handbook. Butterworth-Heinemann Oxford; Boston, 2001

Uwagi

Brak

Zmodyfikowane przez dr inż. Julian Jakubowski, prof. UZ (ostatnia modyfikacja: 27-04-2023 13:41)

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