

Quality control - opis przedmiotu

Informacje ogólne	
Nazwa przedmiotu	Quality control
Kod przedmiotu	06.9-WM-ZiIP-IJ-ANG-D-15_20
Wydział	Wydział Mechaniczny
Kierunek	Management and Production Engineering
Profil	ogólnoakademicki
Rodzaj studiów	drugiego stopnia z tyt. magistra inżyniera
Semestr rozpoczęcia	semestr zimowy 2022/2023

Informacje o przedmiocie	
Semestr	2
Liczba punktów ECTS do zdobycia	4
Typ przedmiotu	obowiązkowy
Język nauczania	angielski
Sylabus opracował	dr inż. Iwona Pająk

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
Projekt	30	2	-	-	Zaliczenie na ocenę
Wykład	15	1	-	-	Egzamin

Cel przedmiotu

Gaining extended knowledge about statistical quality control methods, in the course of production and acceptance testing, development of skills to evaluate and supervise measurement systems for the needs of SPC.

Wymagania wstępne

Quality and safety management, mathematical statistics, fundamentals of metrology

Zakres tematyczny

Lecture:

L1-L2: Review of issues discussed during first-cycle studies. Basic SPC tools. Control charts for variables and for attributes. Using information from sequence of observations.

L3: Modifications of classic control cards. Data transformations for control cards for short series.

L4: Multisource and multidimensional control cards (T2 Hotelling, MEWMA, CUSUM multi-dimensional cards).

L5: Adaptation control cards. Cards for distributions other than normal.

L6: Acceptance inspection plans. Statistical quality control in acceptance sampling. Acceptance plans for inspection by variables and by attributes. Single sampling, double sampling, multiple sampling and sequential sampling plans.

L7: Analysis of the stability and capability of measurement systems for SPC. Requirements for measurement systems. Analysis on accuracy of bias, linearity and stability of measurement system. Capability assessment using capability indices C_g , C_{gk} . Analysis of repeatability and reproducibility.

Project:

P1-P3: Stability analysis of the selected process using the $\bar{X}$ -R control chart. Analysis of control card effectiveness for selected mean shifts. Comparison of theoretical and actual effectiveness.

P4-P6: Capability analysis of selected processes. Comparison of capability indices for processes with normal distribution and for processes with non-normal distribution. Distribution transformations.

P7-P9: Analysis of the effectiveness of sampling plans (single and double sampling) indexed by acceptance quality limit. Analysis performed on random samples simulating selected batch defect level.

P10-P12: Presentation of the results.

P13-P14: Verification of solutions - passing the projects.

Metody kształcenia

Lecture: a conventional lecture

Project: a project implemented in groups or individually

Efekty uczenia się i metody weryfikacji osiągnięcia efektów uczenia się

Opis efektu	Symbole efektów	Metody weryfikacji	Forma zajęć
The student is able to use analytical methods for solving mechanical engineering problems, as well as in the decision-making process, for production planning and control.	• K_U13	• egzamin - ustny, opisowy, testowy i inne • projekt	• Wykład • Projekt
The student has orderly and specific theoretical knowledge of branches, within a chosen speciality Quality engineering.	• K_W15	• egzamin - ustny, opisowy, testowy i inne • projekt	• Wykład • Projekt
The student is able to prioritise and carry out his/her own tasks as well as the tasks of others.	• K_K04	• projekt	• Projekt
The student is able to think and act both creatively.	• K_K06	• projekt	• Projekt
The student is able to prepare, document in writing and elaborate issues in technical sciences and in the scientific disciplines relevant to Management and Production Engineering.	• K_U05	• projekt	• Projekt
The student has a thoroughly extensive knowledge of the application of mathematical methods, in order to be able to formulate and solve complex tasks, related to Management and Production Engineering.	• K_W01	• egzamin - ustny, opisowy, testowy i inne • projekt	• Wykład • Projekt

Warunki zaliczenia

Lecture: written exam preceded by obtaining a credit for project classes

Project: arithmetic mean of the grades obtained for each project activity

Final grade: the condition for passing the course is to pass all its forms, the final grade for the course is the arithmetic mean of the grades for individual forms of classes

Literatura podstawowa

1. Montgomery D.C., Introduction to Statistical Quality Control, John Wiley & Sons, New York, 2009
2. Mitra A., Fundamentals of quality control and improvement, John Wiley & Sons, Hoboken, New Jersey, 2008
3. Oakland J. S., Statistical Process Control, Butterworth-Heinemann, 2007

Literatura uzupełniająca

1. Tapiero C. S., The Management of Quality and its Control, Springer, 1996
2. Wheeler D. J., Understanding Statistical Process Control, SPC Press, Knoxville, 2010

Uwagi

Zmodyfikowane przez dr inż. Tomasz Belica (ostatnia modyfikacja: 25-04-2022 09:38)

Wygenerowano automatycznie z systemu SylabUZ