

MODULE DESCRIPTION

Module code	Z-ZIP2-119z
Module name	Inżynieria Jakości
Module name in English	Quality Engineering
Valid from academic year	2016/2017

A. MODULE PLACEMENT IN THE SYLLABUS

Field of study	Management and Production Engineering
Level of education	2nd degree <i>(1st degree / 2nd degree)</i>
Studies profile	General <i>(general / practical)</i>
Form and method of conducting classes	Full-time <i>(full-time / part-time)</i>
Specialisation	Management Engineering
Unit conducting the module	The Department of Manufacturing Engineering and Metrology
Module co-ordinator	Włodzimierz Makiela, PhD hab., Eng., Professor of the University
Approved by:	

B. MODULE OVERVIEW

Type of subject/group of subjects	Specialist subject <i>(basic / major / specialist subject / conjoint / other HES)</i>
Module status	Compulsory <i>(compulsory / non-compulsory)</i>
Language of conducting classes	English
Module placement in the syllabus - semester	2nd semester
Subject realisation in the academic year	Winter semester <i>(winter / summer)</i>
Initial requirements	No requirements <i>(module codes / module names)</i>
Examination	Yes <i>(yes / no)</i>
Number of ECTS credit points	4

Method of conducting classes	Lecture	Classes	Laboratory	Project	Other
Per semester	15			15	

C. TEACHING RESULTS AND THE METHODS OF ASSESSING TEACHING RESULTS

Module target	A student acquires knowledge of the methods and tools applied in quality management systems. A student ought to be able to: independently apply basic techniques in product quality control; independently design control charts; determine the indicators of process quality assessment and measuring equipment and create documents of the quality management system.
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Effect symbol	Teaching results	Teaching methods (l/c/lab/p/other)	Reference to subject effects	Reference to effects of a field of study
W_01	A student has a knowledge of physics, applied mathematics, including optimization problems, as applied to engineering problems to issues from the area of economics and management including process of mathematical modeling.	l/p	K_W01	T2A_W01 T2A_W02
W_02	A student knows the techniques, methods and tools used in the process of solving engineering problems including issues of quality assurance and quality management.	l/p	K_W05	T2A_W07 T2A_W09 S2A_W06
W_03	A student has knowledge of the organization's management in a market economy with the use of synergies arising from the combination of knowledge engineering and knowledge management.	l/p	K_W09	T2A_W09 T2A_W11 S2A_W11
U_01	A student is able to prepare a management plan for a simple project. A student is able to act as project manager with the use of quality management systems.	p	K_U06	T2A_U07 T2A_U10
U_02	A student can pursue the process of self-education, and to solve new tasks with the use of experimental and research methods.	l/p	K_U07	T2A_U05 T2A_U09
U_03	A student can assess the usefulness of methods and tools which serve the purpose of solving a engineering task in the field of production engineering and the organizational and managerial tasks and apply them to research.	l/p	K_U12	T2A_U16 T2A_U18
K_01	A student is aware of the importance and understand the relationships between the activities of engineering and business including the region development and understands the responsibility for taken decisions.	l/p	K_K02	T2A_K02 T2A_K04
K_02	A student is aware of the role of a graduate of a technical university as a person who is a member of the team and the community that properly taking into account the principles of professional ethics resolves dilemmas related to the exercise of the profession.	l/p	K_K03	T2A_K03 T2A_K05 T2A_K07

Teaching contents:

1. Teaching contents as regards lectures

Lecture number	Teaching contents	Reference to teaching results for a module
1	The concept of quality. The requirements as regards product quality. Quality signs. Product reliability. Reliability structures.	W_03
2	Basic notions of mathematical statistics. Statistic production quality control. Shewhart control charts. Alternative control. The methods and tools applied	W_01 W_03

	in quality management systems. FMEA and QFD methods.	
3	Statistical Process Control (SPC). The indicators of process, machine, and measurement systems quality capability. The methods of determining the R&R coefficient as regards measuring instruments.	W_01 W_03
4	The evolution of organisational forms of a production plant from classical control methods, through quality assurance systems, to quality management systems.	W_01 W_02
5	Integrated quality management systems. Process approach to quality management. The principles of creating and documentation contents of quality system.	W_01 W_02
6	Measurement, control, and test equipment. Legal metrology. The requirements concerning PN-ISO 10012-1:1998 and PN-EN ISO 1012:2004 norms. The principles of calibrating measuring instruments.	W_01 W_03
7	The methods of techniques of conducting quality audits. The requirements of the PNISO 19011 norm.	W_01 W_03

2. Teaching contents as regards classes

Class number	Teaching contents	Reference to teaching results for a module

3. Teaching contents as regards laboratory classes

Laboratory class number	Teaching contents	Reference to teaching results for a module

4. The characteristics of project assignments

Project class number	Teaching contents	Reference to teaching results for a module
1	Introductory classes. Familiarising students with the subject matter of projects. OHS training.	K_02
2	Reliability systems.	W_02 W_03 U_02 K_01 K_02
3	Statistical methods – the structure of Shewhart control charts.	W_01 W_02 W_03 U_01 U_03 K_01 K_02
4	Statistical methods – the structure of Shewhart control charts.	W_01 W_02 W_03 U_01 U_02 K_01 K_02

5	Quality policy and company organisation. System procedures.	W_02 W_03 U_01 K_01 K_02
6	Managing and calibrating measuring instruments.	W_01 W_02 W_03 U_01 U_02 U_03 K_01 K_02
7	Quality system audit.	W_02 W_03 U_01 U_03 K_01 K_02

The methods of assessing teaching results

Effect symbol	Methods of assessing teaching results <i>(assessment method, including skills – reference to a particular project, laboratory assignments, etc.)</i>
W_01	Lectures: an open-answer system. A project: quality assessment of projects.
W_02	Lectures: an open-answer system. A project: quality assessment of projects.
W_03	Lectures: an open-answer system. A project: quality assessment of projects.
U_01	A project: written tests on every class (concerning students' preparation for project assignments).
U_02	A project: written tests on every class (concerning students' preparation for project assignments).
U_03	A project: written tests on every class (concerning students' preparation for project assignments).
K_01	Comments during the lecture and a discussion during project classes.
K_02	Constant supervision and attention on the tasks distribution in team in the implementation of measurements and calculations in the project classes.

D. STUDENT'S INPUT

ECTS credit points		
	Type of student's activity	Student's workload
1	Participation in lectures	15
2	Participation in classes	
3	Participation in laboratories	
4	Participation in tutorials (2-3 times per semester)	5
5	Participation in project classes	15
6	Project tutorials	10
7	Participation in an examination	
8		
9	Number of hours requiring a lecturer's assistance	45 <i>(sum)</i>
10	Number of ECTS credit points which are allocated for assisted work <i>(1 ECTS point=25-30 hours)</i>	1.8
11	Unassisted study of lecture subjects	10
12	Unassisted preparation for classes	
13	Unassisted preparation for tests	10
14	Unassisted preparation for laboratories	
15	Preparing reports	
15	Preparing for a final laboratory test	
17	Preparing a project or documentation	20
18	Preparing for an examination	15
19		
20	Number of hours of a student's unassisted work	55 <i>(sum)</i>
21	Number of ECTS credit points which a student receives for unassisted work <i>(1 ECTS point=25-30 hours)</i>	2.2
22	Total number of hours of a student's work	100
23	ECTS points per module <i>1 ECTS point=25-30 hours</i>	4
24	Work input connected with practical classes <i>Total number of hours connected with practical classes</i>	55
25	Number of ECTS credit points which a student receives for practical classes <i>(1 ECTS point=25-30 hours)</i>	2.2

E. LITERATURE

Literature list	<ol style="list-style-type: none"> Adamczak S. Makiela W., <i>Podstawy metrologii i inzynierii jakosci dla mechanikow. Cwiczenia praktyczne</i>, Wydanie I, WNT Warszawa 2010. Sikora T. i inni, <i>Zarzadzanie jakoscia wedlug norm ISO serii 9000:2000</i>, Wydawnictwo Akademii Ekonomicznej, Krakow 2005. Hamrol A., Mantura W., <i>Zarzadzanie przez jakosc. Teoria i praktyka</i>, Wydanie II, Wydawnictwo Naukowe PWN, Warszawa-Poznan 2004. Dietrich E., Schulze A., <i>Metody statystyczne w kwalifikacji sredkow pomiarowych, maszyn i procesow produkcyjnych</i>, Wydawnictwo Notika System, Warszawa 2000. Wawak T., <i>Zarzadzanie przez jakosc</i>, Wydawnictwo Informacji Ekonomicznej, Krakow 1997.
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	<ol style="list-style-type: none">6. Tabor A., Zając A., Rączka M. - praca zbiorowa, <i>Zarządzanie jakością</i>, Tom I-VI, Wydawnictwo Politechniki Krakowskiej, Kraków 1999-2000.7. Polskie Normy (PN-ISO serii 9000, PN-ISO serii 10000, PN-ISO serii 14000, PN-EN ISO 19011).8. <i>Problemy Jakości</i> – miesięcznik.9. <i>ABC Jakości</i> – kwartalnik.
Module website	