



Module name: Quality management in the construction industry

Academic year: 2019/2020 Code: GBUD-2-113-GE-s ECTS credits: 2

Faculty of: Mining and Geoengineering

Field of study: Civil Engineering Specialty: Geotechnical Engineering and Underground Construction

Study level: Second-cycle studies Form and type of study: Full-time studies

Lecture language: English Profile of education: Academic (A) Semester: 1

Course homepage: —

Responsible teacher: dr hab. inż. Więckowski Andrzej (andrzej@izwbit.pk.edu.pl)

Module summary

Methods of quality management, principles, methods and tools used in engineering and economics of quality.

Description of learning outcomes for module

MLO code	Student after module completion has the knowledge/ knows how to/is able to	Connections with FLO	Method of learning outcomes verification (form of completion)
Social competence: is able to			
M_K001	The student is aware of the role of quality in the company. Knows the ratio of its elements on the financial result	BUD2A_K03, BUD2A_K04	Test
M_K002	The student has the competence to independently create solutions, measure the level of product quality and create procedures and control instructions for quality assurance systems	BUD2A_K03, BUD2A_K04	Test
M_K003	Has the competence to act as a quality inspector, with the ability to develop as auditor, both internal and external	BUD2A_K03, BUD2A_K04	Execution of a project
Skills: he can			
M_U001	The student is able to create a Quality Book. Has the ability to use various principles, methods and tools to design an on-line or off-line quality management system and solve the problems related to their functioning, as well as to improve them	BUD2A_U01	Test

M_U002	The student is able to calculate the level of defectiveness, the average number of non-compliances, efficiency of the production process. Is able to calculate the cost of quality and suggest improvements on that basis. Can set equations of economic effects for qualitative data, has the ability to make decisions in the development of quality systems and improve the economic efficiency of enterprises	BUD2A_U01	Test
Knowledge: he knows and understands			
M_W001	The student has knowledge of the methods of quality management, including the principles of creating off-line and on-line systems	BUD2A_W02	Test
M_W002	The student knows the principles of calculating the level of marketing quality of a product, defect rate, the average number of defects, efficiency of the production process, quality costs and economic effects of the use of quality systems	BUD2A_W02	Test
M_W003	The student has sufficient knowledge in the field of the principles, methods and tools used in engineering and economics of quality	BUD2A_W02	Test

Number of hours for each form of classes

Suma	Form of classes										
	Lectures	Auditorium classes	Laboratory classes	Project classes	Conversation seminar	Seminar classes	Practical classes	Fieldwork classes	Workshops	Prace kontrolne i przejściowe	Lektorat
30	15	0	0	15	0	0	0	0	0	0	0

FLO matrix in relation to forms of classes

MLO code	Student after module completion has the knowledge/ knows how to/is able to	Form of classes										
		Lectures	Auditorium classes	Laboratory classes	Project classes	Conversation seminar	Seminar classes	Practical classes	Fieldwork classes	Workshops	Prace kontrolne i przejściowe	Lektorat
Social competence: is able to												
M_K001	The student is aware of the role of quality in the company. Knows the ratio of its elements on the financial result	+	-	-	+	-	-	-	-	-	-	-

M_K002	The student has the competence to independently create solutions, measure the level of product quality and create procedures and control instructions for quality assurance systems	+	-	-	+	-	-	-	-	-	-	-
M_K003	Has the competence to act as a quality inspector, with the ability to develop as auditor, both internal and external	-	-	-	+	-	-	-	-	-	-	-
Skills: he can												
M_U001	The student is able to create a Quality Book. Has the ability to use various principles, methods and tools to design an on-line or off-line quality management system and solve the problems related to their functioning, as well as to improve them	+	-	-	+	-	-	-	-	-	-	-
M_U002	The student is able to calculate the level of defectiveness, the average number of non-compliances, efficiency of the production process. Is able to calculate the cost of quality and suggest improvements on that basis. Can set equations of economic effects for qualitative data, has the ability to make decisions in the development of quality systems and improve the economic efficiency of enterprises	+	-	-	-	-	-	-	-	-	-	-
Knowledge: he knows and understands												
M_W001	The student has knowledge of the methods of quality management, including the principles of creating off-line and on-line systems	+	-	-	+	-	-	-	-	-	-	-
M_W002	The student knows the principles of calculating the level of marketing quality of a product, defect rate, the average number of defects, efficiency of the production process, quality costs and economic effects of the use of quality systems	+	-	-	-	-	-	-	-	-	-	-
M_W003	The student has sufficient knowledge in the field of the principles, methods and tools used in engineering and economics of quality	+	-	-	+	-	-	-	-	-	-	-

Student workload (ECTS credits balance)

Student activity form	Student workload
Udział w zajęciach dydaktycznych/praktyka	30 h
przygotowanie projektu, prezentacji, pracy pisemnej, sprawozdania	10 h
Realization of independently performed tasks	10 h
Examination or Final test	2 h
Summary student workload	52 h
Module ECTS credits	2 ECTS

Additional information

Module content

Lectures

1.The history and development of quality management (2h)

-Presentation of the major contributors in quality management (0.5 h)

-Presentation of the most important milestones of quality management: control systems, control cards, Shewhart cycle, Deming cycle, the concept of quality race, TQC and TQM (1.5 hours)

2.Defining quality (2h)

-Quality as a relationship and quality of a set of properties (0.5 h)

-Marketing quality and technical quality as components of product quality (0.5 h)

-Quality of type and quality of workmanship as components of the technical quality of a product (0.5)

-Sensory profile as part of the marketing quality control of a product (0.5 h)

3.Quality management systems (4h)

-Crosby's quality matrix (0.5 h)

-Division into off-line and on-line systems (0.5 h)

-Presentation of ISO 9000 as a basic quality management system off-line (1h)

-Design and implementation of ISO 9001:2008: quality book, process map, procedures, instructions (1h)

-Principles of designing on-line quality management systems: Deming's principles, the principles of Kaizen, the principle of zero defects, Poka Yoke, the principle of teamwork (2h)

4.Methods of quality management (4h)

-Methods of designing quality management systems: FMEA, FTA (2h)

-Methods of improving quality management systems: Six-Sigma, OKJ, BKJ, KKJ (2h) 5.

Quality management tools (3h)

-The great seven of TQM: Ishikawa diagram, Pareto diagram, analysis spreadsheet, histogram, scatter diagram of correlation, Shewhart control charts, process flow diagram

Project classes

1. Analysis of the level of marketing quality of a product (7.5h)

-Description of a selected product and the variables describing it that are important for assessing the quality of the type (0.5 h)

- Summary of competing products and the variables describing them (1.5 hours)
 - Breakdown of variables into stimulants, destimulants and nominants (0.5 h)
 - Conducting standardization of variables (1h)
 - Assigning a system of weighting variable (2h)
 - Preparing a ranking of products along with conclusions (1.5 hours)
2. Building procedures OKJ, BKJ, KKJ for a company / production line (7.5h)
- Description of the selected company / production line (0.5 h)
 - The choice of subsystems for planning and quality control (2h)
 - Building an algorithm for planning and quality control (2h)
 - Building procedures for planning and quality control subsystems (3h)

Teaching methods and techniques:

Lectures: Treści prezentowane na wykładzie są przekazywane w formie prezentacji multimedialnej w połączeniu z klasycznym wykładem tablicowym wzbogaconymi o pokazy odnoszące się do prezentowanych zagadnień.

Project classes: Studenci wykonują zadany projekt samodzielnie, bez większej ingerencji prowadzącego. Ma to wykształcić poczucie odpowiedzialności za pracę w grupie oraz odpowiedzialności za podejmowane decyzje.

Warunki i sposób zaliczenia poszczególnych form zajęć, w tym zasady zaliczeń poprawkowych, a także warunki dopuszczenia do egzaminu:

Credit is obtained within the primary deadline and one retake. Detailed assessment rules are agreed by the lecturers at the beginning of the semester.

Zasady udziału w poszczególnych zajęciach, ze wskazaniem, czy obecność studenta na zajęciach jest obowiązkowa:

Lectures:

- Attendance is mandatory: No
- Participation rules in classes: Studenci uczestniczą w zajęciach poznając kolejne treści nauczania zgodnie z sylabusem przedmiotu. Studenci winni na bieżąco zadawać pytania i wyjaśniać wątpliwości. Rejestracja audiowizualna wykładu wymaga zgody prowadzącego.

Project classes:

- Attendance is mandatory: Yes
- Participation rules in classes: Studenci wykonują prace praktyczne mające na celu uzyskanie kompetencji zakładanych przez sylabus. Ocenie podlega sposób wykonania projektu oraz efekt końcowy.

Method of calculating the final grade

Grade for the subject is equal to the weighted average 0.5 for the classes and lectures and 0.5 grade for the project.

Sposób i tryb wyrównywania zaległości powstałych wskutek nieobecności studenta na zajęciach:

Excused absence from classes can be made up for with another group, with the consent of both lecturers, and provided that the class covers the same topic.

Prerequisites and additional requirements

Knowledge of the principles of algebra.
Knowledge of mathematical statistics.

Recommended literature and teaching resources

Abdul Razzak Rumane, Quality Management in Construction Projects, CRC Press Taylor & Francis Group 2010.

Mohamed A. El-Reedy, Concrete and Steel Construction: Quality Control and Assurance ,CRC Press Taylor & Francis Group 2014.

Richard L. Nolan, Management: Theory and Practice, and Cases, Harvard Business School, Richard L. Nolan 2013.

Yosef D. Dlugacz, Andrea Restifo, Alice Greenwood, The Quality Handbook for Health Care Organizations: A Manager's Guide to Tools and Programs, John Wiley & Sons, Inc. 2004.

Scientific publications of module course instructors related to the topic of the module

Więckowski A. (2013), The analysis of the concrete mix delivery organisation to the construction site, Creative Construction Conference, Budapest, Hungary, s. 472-481.

Additional information

Participation in the design classes is mandatory: unexcused absences in >20% of all classes results in failing the course.