GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2024-2025

Quality Management (F000899)

Course size *(nominal values; actual values may depend on programme)*

Credits 6.0 **Study time 180 h**

Course offerings and teaching methods in academic year 2024-2025

B (semester 1)	English	Gent	group work
			lecture
			independent work

Lecturers in academic year 2024-2025

Goossens, Dries	EB24	lecturer-in-charge
Van Bulck, David	EB24	co-lecturer

Offered in the following programmes in 2024-2025	crdts	offering
Master of Science in Teaching in Economics(main subject Business Economics)	6	B
Master of Science in Business Economics (main subject Accountancy)	6	B
Master of Science in Business Economics (Double Degree)(main subject Accountancy)	6	B
Master of Science in Business Economics (Double Degree)(main subject Corporate Finance)	6	B
Master of Science in Business Economics (main subject Corporate Finance)	6	B
Master of Science in Business Engineering(main subject Data Analytics)	6	B
Master of Science in Business Engineering (Double Degree)(main subject Data Analytics)	6	B
Master of Science in Business Economics (Double Degree)(main subject Marketing)	6	B
Master of Science in Business Economics (main subject Marketing)	6	B
Master of Science in Business Engineering (Double Degree)(main subject Operations Management)	6	B
Master of Science in Business Engineering(main subject Operations Management)	6	B
Exchange programme in Economics and Business Administration	6	B

Teaching languages

English

Keywords

Quality Management Systems, Measurement system analysis, Acceptance sampling, Statistical Process Control, Process Capability, Design of Experiments, Quality Gurus, Total Quality Management, ISO 9000, Six Sigma

Position of the course

This course deals with the concepts of quality and quality systems. First, the quality of measurement systems is discussed, together with ways to quantify and evaluate the accuracy, precision, and reproducibility of a measurement system. Next, quality control is discussed: how can we decide whether a lot of items satisfies quality requirements (e.g. using inspection sampling). An important part of this course is statistical process control, which is a technique based on control charts and process capability indices used to bring the mean of important quality characteristics closer to the target, and/or minimizing the variance of these characteristics. Tools and techniques for quality analysis, assurance and control, including Quality Function Deployment and data analysis (and modelling) methods, are also discussed. It discusses the organization of quality care in industrial companies, and the steps to set up and implement a quality management system possibly integrated with existing systems (ISO, safety programs, HACCP, ...).
The graduates should be able to formulate innovative ideas in order to improve an

organization's performance with respect to quality. Innovation within an organization entails 'change management' projects, and therefore, the students will get a training to learn how to support and implement changes. Moreover, a number of attitudes like working independently, creativity and critical awareness, have to be developed further.

Contents

Introduction to quality: definitions, history, cost of quality
Statistics for quality
Quality measurement: repeatability and reproducibility analysis
Quality control: acceptance sampling plans, OC curve, attributes vs. variables
Statistical process control: variation, control charts (variables/attributes): interpretation & implementation, rational subgrouping, process capability
Quality design: quality function deployment, failure mode and effects analysis, reliability, design of experiments, tolerancing
Quality gurus: Deming, Juran, Crosby, Taguchi, Shingo, Imai
Quality management systems: TQM, Six Sigma, ISO-9000
Quality certificates & prizes

Initial competences

Basic statistics prerequisite (descriptive statistics, probability, basic distributions, hypothesis testing, confidence intervals, inference). The course material includes a chapter that recapitulates the statistics relevant for this course with some exercises (self study). This offers a possibility for students with a weak background in statistics to catch up or refresh their knowledge. Please note that the focus of this course is more on engineering than on management, which requires some affinity with statistics.

Final competences

1 Be able to explain the key components of quality concepts (insight);
2 Assess the quality of raw materials and finished goods using acceptance sampling (insight and application).
3 Be able to set up and analyse control charts (insight & application);
4 Be able to assess quality analyses in a production system (application);
5 Be capable to analyse and solve quality problems based on a sound knowledge of quality concepts and theories (application);
6 Be able to set up and analyse design of experiments (insights & application);
7 Be able to explain and critically reflect on quality management systems (insights & application);
8 Develop innovative ideas to improve the performance of companies (application);
9 Understand the insights of the quality guru's (insights)

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Group work, Lecture, Independent work

Extra information on the teaching methods

Lectures, combined with group work. Students need to tackle one or more practice-oriented cases (group assigments).

Study material

Type: Syllabus

Name: Quality Management
Indicative price: Free or paid by faculty
Optional: no
Language : English
Available on Ufora : Yes
Available in the Library : No
Available through Student Association : No

Type: Slides

Name: Quality Management
Indicative price: Free or paid by faculty
Optional: no
Language : English
Available on Ufora : Yes
Available in the Library : No
Available through Student Association : No

References

A First Course in Quality Engineering (K.S. Krishnamoorthi & V.R. Krishnamoorthi, 2018; 3rd edition) – CRC Press
Quality (D. Summers, 2017; 6th edition) - Pearson
Introduction to statistical process control (P. Qiu) – Chapman and Hall
Statistical Quality Control - A Modern Introduction (D. Montgomery, 2019; 8th edition) – Wiley
Design and analysis of experiments (D. Montgomery, 2019; 10th edition) - Wiley
Practical engineering, process, and reliability statistics (M. Durivage, 2014) – ASQ Quality Press
Quality Toolbox (N. Tague, 2005) - ASQ Quality Press
Statistical Process Control (J. Oakland, 2019; 7th edition) – Routledge
Managing for quality and performance excellence (J. Evans & W. Lindsay, 2011; 11th edition) – Cengage
Statistical quality design and control (R. Devor, 2007; 2nd edition) – MacMillan

Course content-related study coaching

Example exercises with solutions are discussed in the lectures.
Interactive support using Ufora (discussion forum, quiz).
Feedback on case studies per group (appointment).

Assessment moments

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Written assessment

Examination methods in case of periodic assessment during the second examination period

Written assessment

Examination methods in case of permanent assessment

Peer and/or self assessment, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

Extra information on the examination methods

Exam: written exam, closed book. Students will receive a formula sheet on the exam. A simple calculator is allowed.
Permanent-evalution: case study (group assignment) followed by an in-class game. After having finished the case study, a peer-evaluation may result in students receiving a higher/lower score than their group score.

Calculation of the examination mark

First exam period: the final grade is determined by permanent evaluation (25%) and a written exam (75%).
Second exam period: if the student passed for the permanent evaluation part, he/she transfers this score to the second exam period (25% of the final grade). If not, the grade in the second exam period is fully determined by a written exam.