Statistical Quality Control

Programme course

6 credits

Statistisk kvalitetsstyrning

TMQU31

Valid from: 2017 Spring semester

Determined by
Board of Studies for Industrial Engineering and Logistics

Date determined
2017-01-25

Main field of study
Industrial Engineering and Management

Course level
Second cycle

Advancement level
A1X

Course offered for
- Industrial Engineering and Management - International, M Sc in Engineering
- Industrial Engineering and Management, M Sc in Engineering
- Mechanical Engineering, M Sc in Engineering
- Industrial Engineering and Management, Master's programme
- Mechanical Engineering, Master's programme
- Energy-Environment-Management

Specific information
May not be included in the same degree as TMQU06

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Mathematical statistics, Industrial Organization, Quality Management and Engineering

Intended learning outcomes

The course provides a comprehensive coverage of statistical approaches and methods for industrial quality management. After the completed course, the student shall be able to;

- demonstrate deep knowledge about statistical methods for quality technology and management, and in a systematic way select methods to solve advanced quality related problems within industry and service production
- discuss the occurrence and consequences of variation in industrial processes and from a systems perspective identify situations where statistical methods can contribute to improvement of products and processes
- plan and conduct industrial improvement projects based on advanced statistical methods for quality improvement
- on an advanced level discuss principles for collection and analysis of process information for development of processes and products
- analyse and identify improvement needs for measurement systems in industrial organisations
- explain and discuss how procedures for statistical quality control can be implemented and contribute to development in industrial organisations

Course content

Understanding of variation, statistical process control, process improvements through statistical analysis, 7 QC tools, advanced forms of control charts (EWMA, CUSUM, Shewhart charts), Moving Range techniques, time series analyses, control charts for attribute data, capability studies, process mapping, visualisation techniques for effective decision making, statistical analyses in Excel and MINITAB, measurement system analysis, implementation of performance measurement and control.

Teaching and working methods

The course is organised around lectures and workshops where important thematic areas are presented. The course is examined through written assignments, participation in case seminars, lab exercises and a large project that is conducted in cooperation with an industrial company.

Examination

LAB1	Laboratory work	1.5 credits	U, G
UPG1	Hand-in assignment	4.5 credits	U, 3, 4, 5

The final grade is based on the results from the assignments in the course.

Grades
Four-grade scale, LiU, U, 3, 4, 5

Other information
Supplementary courses:
Six Sigma Quality, Quality Management - Project Course

Department
Institutionen för ekonomisk och industriell utveckling

Director of Studies or equivalent
Björn Oskarsson

Examiner
Elisabeth Johansson

Education components
Preliminary scheduled hours: 52 h
Recommended self-study hours: 108 h

Course literature
Montgomery, D. C. (2013) Statistical Quality Control: A Modern Introduction, 7th Edition, Wiley Övrig litteratur delas ut under kursen.

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.