

Transilvania University of Braşov, Romania

Study program: Quality Management

Faculty: Technological Engineering and Industrial Management

Study period: 2 years (master)

1st Year - 1st semester

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Management of industrial and research projects	4	2	-	1	1

Course description (Syllabus): Project management – theoretical aspects. Project life cycle and organization. Project management knowledge areas: project integration management; project scope management; project quality management; project cost management; project communications management.

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Risk management	5	2	-	1	1

Course description (Syllabus): Risk management – theoretical aspects. Risk management processes: Risk Management Planning; Risk Identification; Qualitative Risk Analysis; Quantitative Risk Analysis; Risk Response Planning; Risk Monitoring and Control. Taguchi risk. Methods and tools used for risks assessment. Risk management for quality and reliability of technological processes.

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Quality management system	5	2	-	1	1

Course description (Syllabus): Contributing approach to quality. The ISO 9000:2006 specific terminology. The concept of quality products. Development of concept "quality" and related industrial practices. ISO 9000 family of standards. Requirements of the quality management system according to ISO 9001 standard. Quality management system documentation. Specific development of quality management system. Implementation of quality management. Quality tools.

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Probability and applied statistics	4	2	2	-	-

Course description (Syllabus): Sample space. Events. Probability of events. Fundamental probability theorems. Discrete and continuous random variables, expectation and probability distributions. Statistical important distributions. Random Sampling and Data Description. Distributions of Sampling Statistics. Point and interval estimation. Statistical hypotheses testing.

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Ethics and academic integrity	2	1	1	-	-

Course description (Syllabus): Introduction: The EAI concepts. Ethics. University ethics. University responsibility. Charter of the Transilvania University of Brasov (UTBv). Regulations regarding the professional activity of students in UTBv. Intellectual property. Copyright (copyright) and related rights. Industrial property. Patents. Trademarks. Lack of integrity and academic ethics. Academic fraud, corruption and attempted academic corruption. Types of plagiarism.

2nd semester

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Quality audit and certification	6	2	-	1	1

Course description (Syllabus): Quality management systems documentation; Main concepts regarding the audit of the management systems; Audit process for the certification of the quality management systems and case studies; Accreditation concepts; accreditation procedure; Differences and similitude between the certification and the accreditation process with case studies.

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Environmental quality management	3	2	-	1	-

Course description (Syllabus): Environment management – principle of sustainable development; Environment management system; Implementation of environment management system; Identification of environment aspects; Evaluation of environment aspects; Development of quality - environment integrated management system.

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Modern control technologies and equipment	4	2	-	2	-

Course description (Syllabus): Basic elements in product quality control; Principles for construction and function of measurement instruments; Modern technologies for semi-finished product; Modern technologies of measurement and control in manufacturing engineering; Modern technologies for assembly processes; adaptive control in manufacturing engineering; Using computers in manufacturing engineering control; Economic efficiency in measurement processes.

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Statistical quality control I	4	2	-	2	-

Course description (Syllabus): Modelling process quality: the Stem-and-Leaf plot. The histogram. The Box Plot. Statistical basis of the control charts. Basic principles. The choice of the control limits. The sample size and sample frequency. Rational subgroups. Analysis of patterns on control charts. Phase I and phase II of control chart application. The quality tools. The control chart \bar{x} and R, for average and range. Construction and interpretation for process control. The Operating Characteristic function. The Average Run Length. The process capability study in the case of the average and range chart. The control chart \bar{x} and s, for average and standard deviation. Construction and interpretation for process control. The process capability study in the case of the average and standard deviation chart. The control chart \bar{x} and s with variable sample size. The control chart Me and R, for median and Range. The control chart x and MR, for individual measurements and moving range.

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Reliability	4	2	-	2	-

Course description (Syllabus): Acquirement of basic knowledge regarding the main issues of reliability maintainability and industrial systems availability, with different types of structure; Evaluate these systems with specific procedures.

Optional courses

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
a) Using the Computer for Research in Quality Engineering or b) Measurement Systems Analysis	3	1	-	2	-

Course description (Syllabus): a) Using the computer, we are dealing with probability distributions: Binomial Distribution, Poisson Distribution, Normal Distribution, Exponential Distribution, Weibull Distribution. Histogram. Dotplot Diagram. Boxplot Diagram. Correlation Diagram. Cause-Effect Diagram. Pareto Diagram. Normality testing. Box-Cox transformation. Hypotheses testing.

b) Study of measurement systems by variables: Stability. Systematic error: Independent sampling method, control chart method. Linearity. Repeatability and Reproducibility: Average and Range Method. ANOVA method. Study of attribute measurement systems.

2nd Year -1st semester

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Statistical quality control II	6	2	-	2	1

Course description (Syllabus): The p chart, for fraction nonconforming. The p chart with variable sample size. The Operating-Characteristic function and the Average Run Length for the p chart; The np chart, for the number of nonconforming items; The c chart, for the number of nonconformities. The Operating-Characteristic function and the Average Run Length for the c chart; The u chart, for the number of nonconformities per unit. The u chart with variable sample size. The Operating-Characteristic function and the Average Run Length for the u chart; The Cusum chart. Basic principles. The Tabular Cusum. The Cusum chart for monitoring the process variability; The Exponentially Weighted Moving Average control chart for monitoring the process mean. The Moving Average Chart. The chart for short production run. The chart for multiple stream processes. Acceptance sampling plans.

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Systems reliability and security analysis	6	2	-	2	-

Course description (Syllabus): The acquirement of knowledge regarding the main issues concerning the security of industrial systems, using specific methods: fault tree analysis, event tree, failure mode and effects analysis etc. It is also considered the acquirement of knowledge necessary to use the specific software for system security.

Optional direction 1: Quality management in industrial engineering

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Procedures, methods and maintenance systems	5	2	-	-	1

Course description (Syllabus): Introduction about the activity of maintenance in a company; The stages of repairing machinery; Methods and processes of maintenance; The analysis of maintenance systems; Methods of maintenance management; Maintenance management by costs; The analysis of efficiency of the maintenance activity.

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Occupational health and safety management	5	2	-	1	-

Course description (Syllabus): Basically concepts; Elements of OH&S management system; OHSAS policy; OHSAS implementation; Methodology of risks assessment of accidents and occupational health; Risk assessment of accidents and occupational health at workplaces; Development of quality - environment - OHSAS integrated management system.

2nd semester

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Creativity in engineering	6	1	-	2	-

Course description (Syllabus): The necessity of creativity in engineering. The factors of creativity and their stimulation. Methods and techniques to stimulate creativity. Practical procedures to stimulate creative abilities. Methods and procedures used in creativity. Intellectual property.

2nd Year - 1st semester

Optional direction 2: Quality engineering and management

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Quality management of testing laboratories	5	2	-	-	1

Course description (Syllabus): Structure of a test laboratory (organigram, apparatus, etc.). Establishment of records of devices. Establish device verification data. Methods to verify the devices. Maintenance of test machines. Establishing quality management documentation in testing laboratories.

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Testing of industrial products	5	2	-	1	-

Course description (Syllabus): Choosing products for testing. Establishment of testing methodology. Establishment of testing equipment. Running test activities. Collaboration with other testing laboratories. Drawing up the test report. Dissemination of test results.

2nd semester

Course title	No. of credits	Number of hours per week			
		course	seminar	laboratory	project
Six Sigma	6	1	-	2	-

Course description (Syllabus): The Six Sigma concept Methodology for implementing Six Sigma. Organizational infrastructure. Identifying the 5 steps in applying the Six Sigma methodology The phases of a Six sigma project. Methods of applying the methodology. Resources. Costs. Practical example.