

Module Description, available in: EN

Quality & Control

General Information**Number of ECTS Credits**

3

Module code

TSM_QCheck

Valid for academic year

2021-2022

Last modification

2020-12-14

Coordinator of the module

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Explanations regarding the language definitions for each location:

- Instruction is given in the language defined below for each location/each time the module is held.
- Documentation is available in the languages defined below. Where documents are in several languages, the percentage distribution is shown (100% = all the documentation).
- The examination is available 100% in the languages shown for each location/each time it is held.

	Berne	Lausanne	Lugano	Zurich
Instruction		X E 100%		
Documentation		X E 100%		
Examination		X E 100%		

Module Category

TSM Technical scientific module

Lessons

2 lecture periods and 1 tutorial period per week

Entry level competences**Prerequisites, previous knowledge**

Prior to joining the module, the students should be familiar with the basics of statistics (variance, standard deviation, probability density). The student should also understand the concepts of measurement uncertainty, repeatability and reproducibility. Basic knowledge of ISO9001 standards. Knowledge of design/mechanical drawing reading/tolerancing

Brief course description of module objectives and content

Introduction to quality management

- The quality approach

Problem solving methodology:

- Overview of the most commonly used tools
- Introduction to design of experiments
- Case studies

Introduction to Statistical Process Control

- Fundamentals
- Control charts
- Key parameter identification
- Capability concepts
- Automated process control

Incoming quality control

- Basics
- Formalization of incoming items requirements
- Customer and supplier risk
- Acceptable Quality Level
- 100% quality control vs random sampling quality control

Metrologic performances and measurement capability

- Uncertainty estimation
- Gage repeatability and reproducibility
- Measurement capability index
- Conformity decision

Examples of quality inspection techniques (commonly used in the field of Microengineering)

- Vision-based devices
- Microscopic techniques
- ... other techniques.

Aims, content, methods

Learning objectives and acquired competencies

At the end of the module, the students should

- Understand the quality management approach
- Understand and apply the principles of statistical process control
- Able to estimate the capability of a measuring device for the quality control

- Able to make a conformity decision
- Able to evaluate the resulting customer/supplier risks
- Able to set up a sampling plan for a given Acceptable Quality Level
- Know the most commonly used inspection techniques and understand their main limitations.
- Understand the different methods for problem solving
- Understand the main quality wordings.

Contents of module with emphasis on teaching content

- Introduction to quality management: 10%
- Problem solving methodology: 20%
- Introduction to Statistical Process Control: 20%
- Incoming quality control: 20%
- Metrologic performances and measurement capability: 20%
- Examples of quality inspection techniques: 10%

Teaching and learning methods

- Lectures
- Exercises
- Case studies
- Self-study of inspection techniques

Literature

Duret, D. and M. Pillet. « Qualité en Production : De l'ISO 9000 à Six Sigma », Ed. Eyrolles (2005)

Assessment

Certification requirements

Module uses certification requirements

Certification requirements for final examinations (conditions for attestation)

Evaluation mode: 33.3% exercises during the semester, 66.7% written examination

Basic principle for exams

As a rule, all the standard final exams for modules and also all resit exams are to be in written form

Standard final exam for a module and written resit exam

Kind of exam

written

Duration of exam

120 minutes

Permissible aids

Aids permitted as specified below:

Permissible electronic aids

- calculator (without telecommunication functionality)
- Two pages personal summary

Other permissible aids

No other aids permitted

Special case: Resit exam as oral exam

Kind of exam

oral

Duration of exam

30 minutes

Permissible aids

Aids permitted as specified below:

Permissible electronic aids

- calculator (without telecommunication functionality)
- Two pages personal summary

Other permissible aids

No other aids permitted