

Course Unit	Quality Management	Field of study	Management
Master in	Chemical Engineering	School	School of Technology and Management
Academic Year	2019/2020	Year of study	2
Type	Semestral	Semester	1
Level	2-2	ECTS credits	6.0
Code	6362-354-2103-00-19		
Workload (hours)	162	Contact hours	T 30 TP - PL 30 TC - S - E - OT - O -

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) António Jorge da Silva Trindade Duarte

### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Conceive a quality management system based on the ISO 9000 standards or the EFQM excellence model.
2. Identify the (non) quality costs in organizations and to manipulate a set of techniques for improving the quality (Ishikawa and Pareto diagrams).
3. Manipulate tools such as Quality Function Deployment and Failure Mode and Effect Analysis.
4. Define and to implement monitoring and inspection plans in quality.
5. Manipulate a set of statistical process control tools (histograms, process capability indexes, control charts).

### Prerequisites

Before the course unit the learner is expected to be able to:

1. Have a solid knowledge in Statistics (descriptive, deductive and inductive).
2. Know how to use the computer and electronic spreadsheets (Excel).

### Course contents

Basic concepts in quality management. Quality assurance. Quality improvement. Quality techniques. Quality in design/project. Quality in purchasing. Quality in production.

### Course contents (extended version)

1. Quality management
  - Basic concepts.
2. Quality assurance
  - Quality policy
  - Documents for assurance quality systems
  - ISO 9000 standards
  - Procedures
  - Certification of the assurance quality systems
  - Certification of environmental management systems and total quality management
3. Quality improvement
  - Quality costs: classification and evaluation
  - Quality improvement projects
  - Continuous improvement planning
  - Problem-solving methodology
  - Quality improvement techniques and tools
4. Quality techniques
  - The statistical process control (control charts, process capability indexes, ppm)
  - Gage repeatability and reproducibility
  - Kaizen principles
5. Quality in design/project
  - Design review and Quality Function Deployment (QFD)
  - Failure Mode and Effect Analysis
6. Quality in purchasing
  - Purchasing quality planning
  - Suppliers policy
  - Objective purchasing policy definition
  - costs evaluation in quality control product acceptance and inspection planning
  - sampling (simple, multiple and sequential)
7. Quality in production
  - Organization of control and inspection quality
  - Self control criteria
  - Process control and inspection layout and the dominance concept

### Recommended reading

1. Juran, Joseph M. , De Feo, Joseph A. , Juran's Quality Handbook, 6th edition, McGraw-Hill, 2010, ISBN 9780071629737
2. Douglas C. Montgomery, "Introduction to Statistical Quality Control", 6th edition, John Wiley & Sons, 2009, ISBN 9780470169926
3. ISO 9000 standards family (ISO 9000: 2005, ISO 9001: 2008, ISO 9004: 2009)
4. EFQM Excellence Model 2013, EFQM, ISBN 9789052366708

### Teaching and learning methods

The program will be taught essentially in presence sessions (PS). The subsequent work to deepen the program will be developed either in PS or in non presence sessions (NPS). The PSs include the resolution of problems and clarification of doubts. In the NPS will be given particular relevance to the applied problems which take into account the needs and interests of students.

### Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final, Supplementary)
  - Final Written Exam - 30%
  - Intermediate Written Test - 30%
  - Practical Work - 40%

**Assessment methods**

2. Alternative 2 - (Regular, Student Worker) (Final, Supplementary, Special)  
- Final Written Exam - 100%

**Language of instruction**

English

**Electronic validation**

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18-10-2019	30-10-2019	30-10-2019	04-11-2019